3. Assess the personality type and attributes of self with the help of questionnaire and find out wheather you are a Type 'A' or Type 'B' personality.

Distribution of marks

Experiment	20
Record	08
Viva-voce	12

□□

2016

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *one* question from each Session

Morning Session

1. Measure and Compare the attitudes of college students towards women using "attitude towards Women's Scale". 10

2. Locate four complex indicator of your subject using "Word Association Test". 10

3. Experimentally Demonstrate STM as a function of retention interval. 10

Afternoon Session

1. Assess the personality of your subject by administering Eysenck's personality Inventory Test. 10

2. Demonstrate experimentally effect of similarity on retroactive inhibition. 10

[Turn Over

f) Determine the moment of inertia of a flywheel.

OR

g) Determine the diameter of the given narrow wire using optical bench.

OR

h) Determine the rotativity of sugar solution by using a polarimeter.

OR

i) Determine the grating element of a diffraction grating.

2. Viva-Voce.   12

3. Record.   8

2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Calibrate the given set of weights.   30

OR

b) Determine Poisson's ratio of rubber.

OR

c) Determine Young's modulous by bending of beams.

OR

d) Determine the thermal conductivity of the given bad conductor by Lee's disc method.

OR

e) Determine the mechanical equivalent of heat using Joule's calorimeter.

OR

[2]

h) Beer-Lambert law validation in Colorimeter / Spectrophotometer.

2. Estimate and compare the soil moisture content and pore space of clay, loomy and sandy soil.   6

3. Study the morphology and anatomy of the supplied specimen and give labelled diagrams. Comment on the adaptive features.   11

4. Determine the plant community of an area by using quadrat method. Find out the number of plant species and frequency distribution of individual species.   7

5. Viva-Voce.   6

6. Class Record.   4

2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Perform any *one* of the following choosen by lot :   16

   a) Determine the relation between transpiration and the transpiring surface.

   b) Determine the Osmotic pressure of the Cell-sap of the given plant material by plasmolytic method.

   c) Determine the D.P.D of a suitable plant material (storage tissue).

   d) Study the effect of different known conc. of CO_2 on the rate of photosynthesis of a hydrophyte.

   e) Determine the rate of photosynthesis of an aquatic plant in different wave langth of light.

   f) Determine the pattern of water uptake in starchy, proteinaceous and oily seeds.

   g) Determine the absorbance maxima of Bromophenol blue.

3. Identify and comment upon the spots I to IV with reason. $2\frac{1}{2} \times 4$

    (2 spots from Evolution and 2 spots from Biotechnique are to be given as per syllabus).

4. Practical Record and Sessional Preparation.   4

5. Viva-Voce.   6

□□

2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Conduct any *two* experiments as per the instruction of examiners. 10×2

    a) Determine the Conc. of Dissolved Oxygen in water by modified Winkler's Method.

    b) Estimation of free CO_2 in water.

    c) Determination of pH of water from different sources using pH meter / pH paper / Lovibond Comparator.

    d) Study of an aquarium simulating aquatic ecosystem.

2. Prepare *two* models of biomolecules as per the instruction of examiners. Characterise, identify and submit your prepared models. 5×2

[Turn Over

2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. a) Estimate Fe^{2+} and Fe^{3+} present in the supplied iron solution using standard $K_2Cr_2O_7$ solution of strength_____. 35

OR

b) Find the amount of Copper present in the supplied solution of $CuSO_4$ by iodometry. The strength of $Na_2S_2O_3$ solution provided is_____. 35

OR

c) Determine gravimetrically the amount of nickel present in the supplied $NiSO_4$ solution. 35

2. ViVa-Voce. 10

3. Record. 5

2016

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. What is a check-list ? Distinguish it from Rating scale. Suggest five useful steps for constructing a check-list. 2½ + 2½+5

OR

Discuss five uses of Rating scale. Elaborate Numerical and Graphical rating scales with examples to evaluate learning outcomes. 2+8

2. Prepare a check-list for identifying physical disability of school children. 8

OR

Construct a rating scale to evaluate the attitude of students towards their class room teacher and to the school.

3. Maintenance of Record. 8

4. Viva-Voce Test. 12

V-UG-Geol(H)-XI (Pr)

2016

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Enlarge the given map to twice its size and determine the scale.   10

2. Draw a choropleth map showing the distribution of population in Odisha.   10

3. Show the distribution of population in Baleswar district using point symbols.   7

4. Survey the given area by Prismatic compass and prepare field book.   8

5. Practical Record   2

6. Viva-Voce.   3

2016

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw the following Stratigraphic Units on the outline map of India.   3

    a) Cuddaph Supergroup

    b) Deccan Trap

2. Identify the fossils F_1 to F_6 12

3. Draw and label the fossils F_7 to F_8 5

4. Identify the Ore minerals (O_1 to O_8) megascopically.   12

5. Analyse the ore minerals.   4

6. Lab. Record   2

7. Viva-Voce.   2

2016

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Find out Pattern Intensity Index of 3 persons.   5

<div align="center">OR</div>

   Find out Furuhata's Index of 3 persons

2. Take your own palm print and find out hypothenar, thenar and interdigital area.   10

<div align="center">OR</div>

   Take a palmprint and find out main line formula and finger ball patterns.

3. Write down the procedure of taking palmprints.   5

<div align="center">OR</div>

   How to find out main line formula.

4. Write down the procedure and technique of ABO blood group system.   10

<div align="center">OR</div>

   Find out the blood groups of your subject and write down the procedure adopted.

5. Record   4

6. Viva-Voce.   6

3. a) Examine the effects of taxation on production and distribution.

OR

b) Direct tax and indirect tax are both competitive and complementary; Explain.

4. a) Distinguish between impact and incidence of a tax. Explain how the incidence of a commodity tax is determined.

OR

b) Discuss the features of the Indian tax system and point out its short-comings.

5. a) Describe the various methods of debt redemption and examine their effects.

OR

b) Budget is an effective instrument of economic policy. Elucidate.

2016

Full Marks - 80

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. a) Discuss the features of public goods. How are they different from private goods ?

OR

b) Explain the meaning and types of externalities. Examine the role of Government in correcting the externalities.

2. a) Account for the growth of public expenditure in recent years.

OR

b) Critically examine the Bowen's theory of public expenditure.

2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *two* of the following :   15 × 2

   a) Analyse the functions of tragedy as presented
      in Aristotle's Poetics. (Chapter VI)

   b) Discuss Wordsworth's theory of poetic diction
      in his essay 'Preface to Lyrical Ballads'.

   c) Eliot remarks, "Poetry is not a turning loose of
      emotion, but an escape from emotion ; it is not
      the expression of personality, but an escape from
      personality". Elucidate.

   d) Explain Derrida's strategy of deconstruction for
      reading texts.

2. Write an essay on any *one* of the following in about 500 words.   30

   a) Indo-English Poetry

   b) Shakespearean Sonnets

   c) Victorian Novel

   d) Literature and Mass Media.

3. a) What are the characteristic elements of an effective copy editing ?   10

   OR

   b) Edit the following paragraph for publication :

   It is only stupid people who take remarks too literally as we say that is who do not look for the real meaning in the statements people make. Thus when a friend says you will not be going past the post office will you, he may mean I should be grateful if you would post a letter for me if it is not too much trouble. If you say

No to the question because you are not going past the post office it means to your friend that you are not willing to go out of your way, even a little to oblige him.

4. a) Write a script for television news on derailment of some bogies of a train you recently travelled. 10

   OR

   b) Prepare a feature article on constant mike nuisance in you town.

V-81-0.5   □□

b) Explain the role of th U.N.O in ralation to the Korean issue.

4. a) What is Cold War ? Discuss its origin and impact.

OR

b) Discuss in detail the evolution of the Non-alligned movement.

5. a) Throw light on the Palestinian problems and their solution.

OR

b) Discuss briefly the Indo-Pak relations.

□□

2016

Full Marks - 80

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. a) Examine the main provisions of the Treaty of Versailles. Was it a dictated peace ?

OR

b) Describe the formation and functions of several organs of the League of Nations.

2. a) Write an essay on the rise of Nazism in Germany.

OR

b) Discuss the causes of the Second World War.

3. a) Give an account of the origin, aims and organisation of the U.N.O.

OR

f) Write a program to plot p = sin x, q = cos x within the range $0 \le x \le 2\pi$.

g) Create the following matrix A

$$A = \begin{bmatrix} 3.4 & 2.1 & 0.5 & 4.2 \\ 4.2 & 7.7 & 4.5 & 3.9 \\ 1.8 & 3.5 & 4.6 & 3.7 \\ 8.9 & 8.3 & 1.5 & 3.9 \end{bmatrix}$$

i) The first, second and third columns.

ii) The first, third column.

iii) The diagonal that contains the value (0.5, 4.5, 3.9)

h) Write a program to find factorial of a number.

i) Write a program to check even or odd of a given number.

2. Viva-Voce.   5

3. Record   5

2016

Full Marks - 25

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *five* of the following :   3 × 5

a) Write a function that takes a matrix and return the sum of its Eigenvalues.

b) Write a function to accept two numbers p and q and determines the gcd by Euclide algorithm.

c) Write a function that takes a starting value K and number of iteration 'n' and returns the root of the equation as determined by Newton Raphson method.

d) Fibonacci sequence generation using recursion.

e) Write a program to find the roots of a quadratic equations.

e) Study the lattice dynamics using Lattice dynamic kit.

OR

f) Determine the construction of supplied unknown solution using spectrophotometer.

2. Viva-Voce.   10

3. Record   10

V-51-0.3   □□

2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Study the velocity of ultrasonic waves of various liquids at different temperatures.   30

OR

b) Determine the Hall coefficient and mobility of the specimen using Hall apparatus.

OR

c) Determine the energy gap of given specimen using Four probe method.

OR

d) Determine the velocity of ultrasonic waves in a liquid medium at any temperature using ultrasonic interferometer.

OR

3. a) Elaborate the causes and effects of Air Pollution. Mention the remedial measures to control air pollution.

OR

b) Write short notes on :

i) Wastes

ii) Pollutants

4. a) Critically examine the role of man in global ecological imbalance.

OR

b) Discuss the measures being taken for a harmony between man and nature.

5. a) What is drought ? Discuss the impact and management of drought.

OR

b) Write short notes on :

i) Hazards

ii) Disasters.

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Give diagram wherever necessary

1. a) Bring out the meaning and concept of environment.

OR

b) Discuss the importance of light as a control of environment.

2. a) Give a brief note on the concept and functioning of ecosystem.

OR

b) Write short notes on :

i) Oxygen cycle

ii) Nitrogen cycle.

b) In usual notations used in cluster sampling find an estimator of the population mean and hence compare its efficiency with that of simple random sampling.   6

OR

c) Describe the procedure of two-stage sampling with equal first-stage units and give an expression for the estimator of population mean.   6

d) In two stage sampling with equal first-stage units show that the sample mean $\overline{\overline{y}}_2$ is an unbiased estimator of $\overline{y}$ with

$$V\left(\overline{\overline{y}}_2\right)=\left(\frac{1}{n}-\frac{1}{N}\right)S_b^2+\frac{1}{n}\left(\frac{1}{m}-\frac{1}{M}\right)S_w^2$$

where symbols have their usual meaning.   6

V-66-0.1   □□

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is a Sample Survey? In what respects it is superior to a Census Survey?   6

   b) Discuss briefly the main steps involved in a sample survey.   6

OR

   c) Describe different sources of errors in a sample survey. How can they be controlled?   6

   d) Write notes on :   6

   i) Sampling unit

   ii) Sampling frame

   iii) Finite population correction factor.

2. a) Define random sampling. How is it preferred to other methods of sampling ?   6

b) Prove that in SRSWOR sample mean square is an unbiased estimator of population mean square.   6

OR

c) Describe the procedure of stratified random sampling. Under what condition is stratified random sampling is better than simple random sampling ?   6

d) Compare the efficiency of Neyman and proportion allocation with that of an unstratified random sample of same size.   6

3. a) Explain systematic sampling and state the circumstances when it is optimum. Obtain an unbiased estimator of population mean and derive its variance.   6

b) Prove that the systematic sample mean is more precise than the mean of simple random sample without replacement if $S^2_{wsy} > S^2$.   6

OR

c) Describe the procedure of selecting a sample with varying probabilities and hence find an estimate of the population mean. Taking population size N and sample size n derive its variance.   12

4. a) Explain the ratio method of estimation. Suggest an estimator of the population mean by this method. Find an expression for its bias.   6

b) With the help of difference estimator obtain simple regression estimator of population mean. Derive its expectation and variance.   6

OR

c) Describe ratio and regression methods of estimation. Give a comparison of simple regression estimator with that of ratio estimator of population mean.   12

5. a) Define cluster sampling and state the necessary condition for validity of cluster sampling with help of an example.   6

c) What is Adsorption ? What are the factors influencing the process. 2 + 2

d) Explain the following terms : 2 + 2 + 2

   i) Chemisorption

   ii) Zeta Potential

   iii) Transomittance.

6. a) Discuss the phase diagram of water. 6

b) What are Ideal and Non-ideal solutions ? Explain Azeotropic mixture with example. 2+1+1

OR

c) State Nernst Distribution Law. How can this be derived ? 2 + 4

d) Draw and explain phase diagram of $CuSO_4$–H_2O System. 4

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) State and explain Kohlrausch's Law. How can you determine Equivalent conductance of a weak electrolyte with the help of it ? 2 + 2 + 2

b) Derive Henderson's equation for PH of a Buffer mixture. 4

OR

c) Define 'Transport number'. Suggest a method for determination of it. 2 + 4

d) Explain the terms : 2 + 2

   i) Activity coefficient

   ii) Degree of hydrolysis.

2. a) Explain different types of Reversible Electrodes with Electrode reactions. What is Hydrogen Scale of potential ? 4 + 2

b) Give an account of Liquid junction potential.   4

OR

c) How can you determine Activity coefficient of an electrolyte from e.m.f measurement ?   4

d) Write short notes on :   3 + 3

   i) Hydrogen overvoltage

   ii) Corrossion.

3. a) Derive an expression for Energy of a particle in one-dimensional box.   4

   b) Explain valance bond theory with special reference to H_2^+ ion.   2 + 4

OR

   c) State the basic postulates of Quantum mechanics.   4

   d) Explain the following terms :   2 + 2 + 2

   i) Commutator of Operators

   ii) Momentum Operator

   iii) Hermitian Operator.

4. a) What is a 'Rigid rotator' ? How can you find out the energy levels for it ? Mention the selection rules for Rotational Spectra.   1 + 3 + 2

   b) Write notes on :   2 + 2

   i) Quantum theory of Raman effect

   ii) Energy levels of a Simple Harmonic Oscillator.

OR

   c) Write notes on :   3 + 4 + 3

   i) Effect of isotopic Substitution in Rotational Spectrum

   ii) Hot bands and Overtones in Vibrational spectrum.

   iii) Regions of Electromagnetic Spectrum.

5 a) State and explain Laws of Photochemistry. Explain 'Quantum Effeciency'.   2 + 2 + 2

   b) Distinguish between 'Fluorescence' and 'Phosphorescence'   4

OR

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Give labelled diagrams wherever necessary.

1. What is absorption of water ? Describe the mechanism of water absorption in plants.

OR

Write notes on any *two* of the followings :

a) Plasmolysis

b) Water potential

c) Mechanism of stomatal movement.

2. What is cyclic and non-cyclic photophosphorylation ? Give an account of electron transport in chloroplast.

OR

[Turn Over

Write notes on any *two* of the followings :

a) Photorespiration

b) Emerson's enhancement effect

c) C$_4$ plants.

3. Describe the reaction steps of Krebs cycle with the role of enzymes in each step. Add a note to its significance.

OR

Write notes on any *two* of the followings :

a) Factors affecting respiration

b) Properties of enzyme

c) Isoenzyme.

4. Describe the phenomenon of photoperiodism in higher plants and discuss the mechanism involved.

OR

Write notes on any *two* of the followings :

a) Transcription

b) Biological nitrogen fixation

c) Central dogma.

5. What is phytohormones ? Describe the structure and physiological role of gibberellins in plant growth.

OR

Write notes on any *two* of the followings :

a) Causes of dormancy of seeds

b) Mechanism of senescence

c) Biological clock.

[4]

c) What is Bezier curve ? Find out the Polynomial Equation of a Bezier curve passing through 4-control points.   12

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is the main advantage of passing arguments by reference ? Write a program to compute the area of a triangle and circle by overloading the area ( ) function.   2 + 4

   b) What is friend function ? Give an example of using friend function   6

   OR

   c) Differentiate between a constructor and a destructor. Describe different types of constructors used in C++ with suitable syntax   12

2. a) What is Polymorphism ? How is it achieved in C++ ?   6

b) What is virtual keyword ? Give an example of using virtual keyword. 6

OR

c) What are exceptions ? What happen when an unexpected exception in raised ? 6

d) What is inheritance ? Give an example of multilevel inheritance. 6

3. a) Describe various classes available for file operations. 6

b) Describe the various approaches by which we can detect the end-of-file condition successfully. 6

OR

c) Write short notes on : 12

i) Command line Arguments

ii) File Modes

iii) Object Oriented System Development

iv) Booch's Model.

4. a) What is meant by geometric transformation ? Describe translation, scaling and reflection in geometric transformation. 12

OR

b) Explain the technique used in CRT with a required diagram. 6

c) Find the pixel illuminated by DDA algorithm when two end points P1(1, 1) and P2(–8, –4). 6

5. a) Explain Z-buffer algorithm for hidden surface elimination. 6

b) Write notes on the following : 2×3

i) Polygon clipping

ii) Projection.

OR

3. Give an account of the characteristics of population.

OR

Write notes on any *two* of the following :

a) Waterborne diseases

b) Human health and environment

c) Mortality.

4. Discuss briefly deforestation, afforestation and social forestry.

OR

Write notes on any *two* of the following :

a) Soil erosion

b) Alternate energy resources

c) Renewable energy resources.

5. What is Biodiversity ? Describe different methods of Conservation of Biodiversity.

OR

Write notes on any *two* of the following :

a) State Pollution Control Board

b) Wild Life Protection Act

c) Air Act.

2016

Full Marks - 100

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Give labelled diagrams wherever necessary.

1. Give an acount of the energy flow in an ecosystem.

OR

Write notes on any *two* of the following :

a) Carbon cycle

b) Food chain

c) Components of ecosystem.

2. Discuss the causes, effect and control measures of Water Pollution.

OR

Write notes on any *two* of the following :

a) Ozone layer depletion

b) Flood

c) Solid Waste Management.

[Turn Over

b) State the main provision of Banking Regulation Act, 1949. 16

4. a) Explain the structure and capital of Land Development Banks. 16

OR

b) Write notes on : 8 + 8

i) Objectives of RRBs.

ii) Role of Cooperative Banks in rural India.

5. a) Explain the objects and monetary policy of R.B.I. 16

OR

b) How credit control measures taken by R.B.I is effective in controlling credit ? Discuss 16

2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions of any *one* of the following groups

GROUP-A
(FM)

1. a) What is the scope of finance function in a business enterprise ? Should the goal of financial decision making be profit-maximisation or wealth-maximisation ? 6 + 10

OR

b) A company is considering an investment proposal to purchase a machine costing ₹2,50,000. The machine has life expectancy 5 years with no salvage value, Tax rate 40%. The company follows straight line method for providing depreciation. Estimated cash flow before Tax after depreciation from the machine are as follows : 16

Year	Cashflow before Tax after Depreciation (₹)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

Calculate :

i) Pay-back period

ii) Average rate of return

iii) Net present value and profitablility index at 10% discount rate

Year	1st	2nd	3rd	4th	5th
PV factor 10%	0.909	0.826	0.751	0.683	0.621

2. a) Define the concept of "Cost of Capital". State how would you determine the weighted average cost of capital of a firm.　　16

OR

b) A company issues ₹10,00,000, 12% debenture of ₹100 each which are redeemable after 7 years. Tax rate is 35%. Calculate cost of debt after Tax if debentures are issued at (a) par (b) 10% discount (c) 10% premium.

Take brokerage 2% in all the cases.　　16

3. a) Write notes on :　　8 + 8

i) Financial leverage

ii) Operating leverage.

OR

b) Find the operating leverage from the following :　　8

Sale ₹500,000

Variable Cost 60%

Fixed Cost ₹1,20,000

c) Find the financial leverage from the following data :　　8

Net worth ₹50,00,000

Debt/Equity 3/1

Interest rate 12%

Operating profit ₹40,00,000.

4. a) Write notes on : 8 + 8

   i) The irrelevance concept of dividend

   ii) The relevance concept of dividend.

   OR

   b) A company has 1,00,000 shares selling at ₹100 each. The appropriate capitalisation rate is 10%. The firm is contemplating the declaration of a ₹6 dividend at the end of the current financial year, which has just begun :

   i) What will be the price of shares at the end of the year (i) if dividend is declared and (ii) if dividend is not declared, basing on the MM model

   ii) Assuming that the firm pays dividend, has net income ₹10,00,000 and makes new investment of ₹20,00,00 during the period, how many new shares must be issued, based on MM model.(Assume no tax in both the cases) 16

5. a) What do you mean by 'Inventory' and 'Inventory Management. What are the objectives of such management ? Briefly discuss some tools and technique of Inventory Management. 16

   OR

   b) What do you mean by working capital ? What will be the repercussions if a firm has (a) Inadequate working capital (ii) Redundant working capital. 16

GROUP-B
(POM)

1. a) What is meant by marketing ? Explain the nature and importances of marketing for a modern business. 4 + 12

   OR

   b) i) Distinguish between marketing and selling. 8

   ii) Bring out the differences between traditional and modern market concept. 8

2. a) What do you understand by consumer behaviour ? Discuss its scope and significances. 4 + 12

   OR

b) Discuss the concept and importances of market segmentation. 16

3. a) What do you mean by product planning and development ? Describe the techniques and processes of product planning and development. 4 + 12

OR

b) Discuss the factors affecting the price of a product. 16

4. a) Describe the meaning and characteristics of channel of distribution. Explain the role of channel of distribution for promoting sales. 8 + 8

OR

b) What is meant by physical distribution ? Why is it important to business. Discuss the various components of channel of distribution. 4 + 12

5. a) What is Advertisement ? Explain its features and implications. 4 + 12

OR

b) What is Personal Selling ? Describe the steps involved in personal selling. Explain the functions of a Sales man. 3 + 5 + 8

GROUP-C
(IBS)

1. a) Discuss the various function of Commercial Banks. 16

OR

b) Discuss the recent trends in Indian Banking System. 16

2. a) Discuss the functioning and role of State Bank of India in agriculture. 16

OR

b) Describe the organisational structure of S.B.I. 16

3. a) Discuss the applicability of the Banking Regulation Act. to Co-operative Banks. 16

OR

7	10,000
8	15,000
9	10,000
10	4,000

Using 10% as the cost of capital, determine the net present value and profitibility index of the investment.   16

OR

b) Give a comparative description of net present value method and internal rate of return method.   16

5. a) Explain in brief PERT, CPM, bringing out the distingushing features.   16

OR

b) Write short notes on : 4×4

i) Event

ii) Activity

iii) Pessimistic time

iv) Float.

2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Briefly describe the simplex method of solving a linear programming problem.   16

OR

b) Given is the following information :   16

i) Profit of product A : ₹6 per gross

   Profit of product B : ₹5 per gross

ii) Production of products A and B is limited by the capacity of 120 hours per week in polishing and 40 hours in plating.

iii) Production time requirements (hours per gross)

	Product A	*Product B*
Polishing	3	4
Plating	2	1

iv) Production of A and B products can never be in negative terms.

Solve the problem for maximisation of profits through graphic method. 16

2. a) Explain the various steps involved in solving a transportation problem by applying the North-West Corner Rule. 16

OR

b) Three jobs P, Q and R are to be assinged to three machines X, Y and Z. The processing cost for each job-machine combination is shown in the matrix. Determine the allocation that minimises the overall processing cost : 16

Machines

	X	Y	Z
P	17	25	31
Q	10	25	16
R	12	14	11

Jobs (Cost in ₹ per unit)

3. a) Define Inventory. What are the advantages and disadvantages of having inventories. 4 + 12

OR

b) The demand for a particular item is 18,000 units per year. The holding cost per unit is ₹1.20 per year and the cost of one procurement is ₹400. No shortages are allowed and the replacement rate is instantaneous.

Determine :

i) Optimum order quantity

ii) Number of orders per year

iii) Time between orders

iv) Total cost per year when the cost of one unit is ₹1. 16

4. a) A company has an investment opportunity costing ₹40,000 with the folowing expected net cash flow after taxes and before depreciation.

Year	Net Cash flow (₹)
1	7,000
2	7,000
3	7,000
4	7,000
5	7,000
6	8,000

b) Discuss sex-linked genetic disorders in human with examples.

4. a) What is Chromosome abnormality ? Describe chromosomal abnormality in humans with examples from autosomal and sex linked abnormalities.　　　　12

OR

b) Discuss how human genetic in studid.

5. a) Give a detail account of medicolegal application of human genetics.　　　　12

OR

b) With examples describe Prenatal diagnosis and its application in humans.

□□

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you mean by Human Genetics ? Give an elaborate account of aim and scope of Human Genetics.　　　　12

OR

b) Discuss different branches of Human Genetics.

2. a) Define Meiosis and describe Meiosis in an animal cell with diagrams.　　　　12

OR

b) Diagrammatically describe the structure and function of DNA.

3. a) Explain Mendel's Laws of inheritance.　　12

OR

3. Elaborate the growth of pole approach in regional development.

OR

Write short notes on :

a) Land use planning

b) Economic base theory.

4. Discuss the achievement and failures of Five Year Plan in India.

OR

Explain the impact of new economic reforms on India's economy.

5. Discuss the role of IRDP for regional development.

OR

Give an account of Damodar Valley Corporation Project.

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. What is a region ? Discuss different types of region with example.

OR

Write short notes on :

a) Metropolitan city region

b) Regional disparity vs. diversity.

2. Describe the objective, goals and strategies in national planning.

OR

Discuss intergrated area development as a strategy for regional development.

b) Define Split Plot design and give a complete statistical analysis of such design.   12

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Stating clearly the assumptions carry out the analysis of variance for a two-way-model (with one observation per cell).   6

   b) Explain an experimental design. Describe the principles of experimental design.   6

   OR

   c) State some applications of analysis of variance with suitable examples explain the difference between variability within classes and variability between classes.   6

   d) Distinguish between fixed effect model and random effect model in the analysis of variance.   6

2. a) Give the layout of a completely randomised block design and explain the situations when it is used. Discuss its merits and demerits.   6

b) Give the complete statistical analysis of completely randomised design.   6

OR

c) What do you understand by missing plot ? Carry out the analysis of an RBD when one observation is missing.   6

d) Describe Latis Square Design and give a complete analysis of the design.   6

3. a) Explain the factorial method of experimentation and state the situation where it could be used.   6

b) Give the analysis of degrees of freedom in a factorial experiment with three factors at two levels each in three replications.   6

OR

c) What is a treatment contrast ? When are two such contrasts said orthogonal? Show that in 2^3 experiment the main effects and interactions are mutually orthogonal.   12

4. a) Explain the principles of confounding in design of experiments. State its advantages and disadvantages, how disadvantages can partially overcome.   12

OR

b) In testing the values of fertilizers N, P and K each at two levels, eight pairs of blocks of 4 plots are used. The treatments (N, P and NPK) are put in one block. What should be the composition of other block for completely confounding the second order interaction. Give the analysis of variance table for this confounded factional design.   12

5. a) Describe the layout of a 2^3 experiment where all the interactions are partially confounded. In such a case indicate degrees of freedoms and sum of squares for all the components of treatments.   12

OR

v) Transition elements are usally paramagnetic in nature.

OR

b) What are lanthanides ? Discuss ion exchange method of separation of lanthanides. 1 + 4

c) Give an account of the oxidation states of lanthanides. 3

d) Why are 'd' block elements called as transition elements ? 2

6 a) What is binding energy ? How it is related to mass defect ? Explain. 4

b) Write notes on the following :
i) Carbon dating. 3
ii) Artificial radioactivity. 3

OR

c) Discuss the liquid drop model of nucleus. 5

d) Write notes on the following :
i) Nuclear fission 3
ii) Packing fraction. 2

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Explain the origin of maganetism. Write the experimental determination of magnetic susceptibility by Gauy's method. $3 + 5\frac{1}{2}$

b) Calculate the magnetic moment of the complex $[Co(NH_3)_6]Cl_3$ using spin only formula. $1\frac{1}{2}$

OR

c) Describe the electronic spectra of $[T_i(H_2O)_6]^{3+}$. 5

d) What are the relaxations made as to the d-d transition rule in order to apply it to metal complexes ? 5

2. a) Discuss the structure and role of haemoglobin in maintaining the physiological pH and transport of CO_2 from the tissue to lungs. 5

[2]

b) Discuss the role of Na and K as ion pumps. 5

OR

c) Write a note on myoglobin.   5

d) Explain the role of redox potentials in extraction of metals.   5

3. a) Define organo-metallic compounds. How are they different from normal co-ordination compounds ? Explain with examples.   1 + 3

b) Discuss the preparation and properties of organometallic compounds of tin.   6

OR

c) Give the classification of organometallic compounds based on the electronagetivities of the metal atom.   4

d) Outline the general methods of synthesis of organozinc compounds. Write two important chemical reactions of these compounds.   3+3

4. a) What is meant by back bonding ? How this contact help to explain the bonding in metal carbonyls ? Discuss with example.   2 + 5

[3]

b) Predict and explain whether the following metal carbonyls obey the EAN rule or not.   3

i) $V(CO)_6$

ii) $Mn_2(CO)_{10}$

OR

c) Give an account of the preparation and structure of   4 + 4

i) $Fe(CO)_5$

ii) $Cr(CO)_6$

d) How vibrational spectra helps to understand bonding in metal carbonyls ? Explain.   2

5. a) Explain the following : 2×5

i) CO^{3+} is more stable than CO^{2+}.

ii) Zn^{2+} salts are white while Cu^{2+} salts are blue.

iii) Transition elements show variable oxidation states. Explain with an example.

iv) Transition elements usally form coloured compounds.

[4]

c) Write the Output : 2

```
class Demo
{
  public static void main (string args [ ] )
    {
    int x = 9, y, z ;
    y = ++x ;
    z = y++ ;
    system.out.print ("X="+x+"\tY="+y+"\tZ ="+z);
    }
}
```

OR

a) Write a note on all the twelve unique features in JAVA in brief. 6

b) Write a program on JAVA to ckeck whether a number inputted is PALINDROME number or not 4

c) What is JVM ? 2

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Briefly discuss the concepts of Multiplexing and its Types. 6

   b) Define transmission modes. Write down its Type in brief. 4

   c) Differentiate Analog Data from Digital Data. 2

OR

a) Briefly discuss the concepts of Line Coding and its types with suitable examples. 6

b) What do you mean by impairments in Transmission ? Write down its Types in brief. 6

c) Differentiate Digital Signal from Analog Signal. 2

2. a) What do you mean by errors in networking concept ? Write a note on its types with examples. 6

b) Briefly discuss about Telephone Network. 4

c) Differentiate Guided Media from Unguided Media. 2

OR

a) Write a detailed note on ARQ and its Types. 6

b) Briefly discuss about circuit switching with suitable examples. 4

c) Differentiate Error Correction from Error Detection. 2

3. a) Write a note on Ethernet and its Types in details. 6

b) Write note on addresses in TCP/IP in details 4

c) Differentiate CSMA/CA from CSMA/CD. 2

OR

a) Write a note on Congestion Control in details. 6

b) Write a note on Routing in details. 4

c) Differentiate Connection-oriented Protocol from Connectionless Protocol. 2

4. a) Compare and Contrast Symmetric Key Cryptography with Aymmetric Key Cryptography. 6

b) Write a note on Attacks on Digital Signature in details. 4

c) Differentiate Decryption from Encryption. 2

OR

a) Write a note on Techniques of User Authentication in brief. 6

b) Write a note on DES structure in details 4

c) Differentiate Cipher Text from Plain Text. 2

5. a) Write a note on Operators in JAVA. 6

b) Write a program on JAVA to check whether a number inputted is ARMSTRONG number or not. 4

2016

Full Marks - 100

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Give labelled diagrams wherever necessary.

1. Give an account of the energy flow in an Ecosystem.   20

OR

Write notes on ant *two* of the following :   10 × 2

a) Food chain

b) Ecological pyramids

c) Hydrological cycle.

2. Discuss the causes, effects and control measures of Water Pollution.   20

OR

[2]

Write notes on ant *two* of the following :   10 × 2

a) Acid rain

b) Cyclone

c) Solid Waste Management.

3. Discuss briefly the different Waterborne and Airborne diseases.   20

OR

Write notes on ant *two* of the following :   10 × 2

a) Natality

b) population density

c) Carrying capacity.

4. Give an account of the various non-renewable resources.   20

OR

Write notes on ant *two* of the following :   10 × 2

a) Soil conservation

b) Social forestry

c) Management and conservation of wild life.

[3]

5. Discuss briefly the Air act and water Act.   20

OR

Write notes on ant *two* of the following :   10 × 2

a) State Pollution Control Board

b) Ex-situ conservation

c) Wild Life Protection Act.

□□

3. a) What do you understand by the term "leadership" ? Enumerate its important characteristics.   4 + 12

OR

b) Explain Social learning theory of personality ?   16

4. a) Define the term stress. Bring out the impact of stress on performance and satisfaction.   4+12

OR

b) Can organisations prevent resistance to change ? If so how ?   10 + 6

5. a) What do you mean by Quality circle ? State its advantages.   8 + 8

OR

b) Describe the determinants of group behaviour.   16

2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you mean by organisational behaviour ? Explain its features.   8 + 8

OR

b) Explain the traits that reflect personality of a person.   16

2. a) What do you mean by perceptual distortion ? How can developing perceptual skills help to avoid perception distortion   6 + 10

OR

b) Discuss how an understanding of attitudes is useful for the study of organisational behaviour.   16

[2]

3. Discuss in details the 'Risk' and 'Uncertainty bearing' theories of profit. 14

OR

Write notes on any *two* of the following : 2 × 7

a) The sinking-fund method of measuring depreciation.

b) Calculation of the 'Break-even' point

c) Innovation theory of profit.

☐☐

2016

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write notes on : 7 + 7

a) Incremental principle

b) The 'Equi-marginal' principle.

OR

Discuss in details the various objectives of a Business firm. 14

2. State and explain the 'law of demand'. Why does the demand curve slope downward ? 12

OR

Write notes on any *two* of the following : 2 × 6

a) Price elasticity of demand

b) Cross elasticity of demand

c) Factors effecting elasticity of demand.

[4]

c) Write notes on : 7 + 6
  i) Advertising objectives
  ii) Advertising budgets.

2. a) Discuss in detail about : 7 + 6
  i) Media selection decisions
  ii) Advertising on Internet and Broad Casting.

OR

b) Write notes on : 6 + 7
  i) Copy development
  ii) Types of appeal.

3. a) Describe in detail : 7 + 7
  i) Managing Advertising Agency and client relationship
  ii) Promotional scene in India about the advertising effectiveness.

OR

b) Write notes on : 7 + 7
  i) Selling process
  ii) Product and customer knowledge.

2016

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions from any **one** of the following groups

GROUP-A
(FM)

1. a) "Finance function is closely related to its other functions" – Discuss. 13

OR

b) Assuming wealth maximisation to be the objective of financial management, show how the financing, investment and dividend decisions of a company can help to attain this objective. 13

2. a) Following are the data on a capital project 'CP' being evaluated by the management of K. Ltd. :
  Annual cost saving   ₹40,000.
  Useful Life   4 years
  IRR   15%
  Profitability Index   1.064
  Salvage value   Nil

[Turn Over

Find : NPV, Cost of Capital, Cost of Project, Payback Period, considering the following table of discount factor only :   14

Discount factor	15%	14%	13%	12%
1st year	0.869	0.877	0.885	0.893
2nd year	0.756	0.769	0.783	0.797
3rd year	0.658	0.675	0.693	0.712
4th year	0.572	0.592	0.613	0.636
	2.855	2.913	2.974	3.038

OR

b) Under what Circumstances may NPV and IRR give conflicting recommendations ? Which criteria should be followed in such circumstances and why ?   14

3. a) Distinguish between operating leverage and financial leverage. Do you think that they are related to Capital Structure ?   13

OR

b) The following items have been extracted from the 'Liabilities' side of the Balance sheet of a company as on 31st December 2015. :

Paid up capital :

50,000 Equity share of ₹10 each   ₹5,00,000

Reserves and surplus ₹7,00,000

Loans :

17% non-convertible debentures ₹2,00,000

16% institutional loans ₹6,00,000

Other information about the company as relevant given below :

Year ended 31st Dec	Dividend Per share (₹)	Earnings Per share (₹)	Average Market price (₹)
2015	5.00	9.00	60.00
2014	4.00	7.50	50.00
2013	5.00	6.00	40.00

Calculate Weighted Average Cost of Capital using Book Values as weights and Earning/price (E/P) ratio as the basis of cost of equity. Assume tax rate 50%.   13

GROUP-B *(ASM)*

1. a) Justify advertising is the vital tool of marketing.   6

b) Discuss the economic and social effects of advertising specially in the context of indian scenario.   7

OR

2016

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions from any *one* following groups

GROUP-A

(SAPM)

1. a) Discuss in detail the nature and scope of Investment analysis.   7

   b) Explain the avenues of investment in the security market.   6

   OR

   What are the different types of Financial Assets and describe in detail their characteristics.   13

2. a) State the role, functions and methods of selling securities in primary market.   7

   b) Discuss in detail the Allotment procedure.   6

   OR

Write notes on :   7 + 6

i)   Appointment of merchant banker

ii) Appointment of underwriter and broker.

3. a) What do you mean by secondary market for dealing the securities ? Discuss the role and importance of secondary market in trading of securities.   6 + 8

OR

Write notes on :   7 + 7

i)   Trading mechanism of securities

ii) Listing of securities in stock exchange.

GROUP-B

(IM)

1. Discuss the nature and significance of International Marketing.   14

OR

Discuss the various strategies for entering international market.   14

2. Discuss the political and legal environment for international marketing.   14

OR

Discuss about the global market segmentation. 14

3. Write notes on :   6 + 6

i)   Management of international brand.

ii) Standardisation Vs. Product Adoption in international market

OR

Discuss the pricing policies and strategies for international market   12

b) What is a compound nucleus ? Discuss the theory of a compound nucleus. Giving a suitable example, write how one can determine the Q-value after it is targeted by a bomarding agent.   2 + 10 + 5

3. a) What are quarks ? Briefly describe the quark model.   2 + 10

OR

b) What do you mean by isospin ? Explain the various quantum numbers like strangeness, Leptonic number and Baryonic number. How do they get conserved ?   2 + 2 + 2 + 2 +4

V-117-0.3   ☐☐

2016

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Give a brief account of the nature of nuclear forces. What is the approximate nature of the potential that is responsible for an exchange interaction ? Comment on its range.   4+2+2

b) What are the roles of 'pions' in nuclear mediation ?   4

OR

c) Give the comprehensive theory of nuclear shell model. What are magic numbers ? What do they signify ?   8 + 2 + 2

2. a) Critically discuss Fermi's theory of beta decay. How can you explain parity violation using this theory ?   12 + 4

OR

3. Give a Stratigraphic account of Cretaceous of Trichinopoly. 12

OR

Write notes on : 6 + 6

a) Tertiary of Assam

b) Siwalik Group.

4. Describe the various modes of preservation of fossils 12

OR

Write notes on : 6 + 6

a) Geological History of Graptolite.

b) Significance of foraminifera.

5. Describe the morphology of a Brachiopoda Shell with neat sketches. 12

OR

Write notes on : 6 + 6

a) Geological History of Cephalopoda

b) Dentition in Pelecypoda.

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Give a Stratigraphic account of Dharwar supergroup of rocks. 12

OR

Write notes on : 6 + 6

a) Geological Time-scale

b) Stratigraphic Cor-relation.

2. Give a Stratigraphic account of Cuddapah supergroup of rocks. 12

OR

Write notes on : 6 + 6

a) Geology of Odisha

b) Deccan Traps.

3. Give an account of the energy flow in ecosystem.

OR

Write notes on the following :

a) Terrestrial ecosystem

b) Ecological pyramids.

4. What are natural resourses ? Give an account of the conservation of natural resources.

OR

Write notes on the following :

a) Vegetational zones of Odisha

b) Social forestry.

5. Discuss the causes, effects and control measures of Air pollution.

OR

Write notes on the following :

a) Noise pollution

b) Soil pollution.

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Give labelled diagrams wherever necessary.

1. Give an account of Nitrogen cycle.

OR

Write notes on the following :

a) Hydrologic cycle

b) Population ecology.

2. Describe the different stages of development of Xerosere.

OR

Write notes on the following :

a) Anatomical features of Hydrophytes

b) Morphological features of Halophytes.

Briefly state different stages of cognitive development of children described by Piaget.   12

4. Discuss different characteristics of childhood emotion.   12

OR

How does the self-concept develop during early childhood ?   12

5. Discuss different Social and emotional developments during adolescence.   6 + 6

OR

Briefly describe the development of gender through the life span.   12

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Discuss different characteristics and assumptions of life-span development.   12

OR

Critically evaluate different Psychoanalytic theories of development.   12

2. What do you mean by "time-span research" ? Discuss different approaches to time-span research.   4 + 8

OR

Describe some of the ways that heredity and environment interact to produce individual differences in development.   12

3. Discuss the factors which affect prenatal development.   12

OR

b) Write notes on : 8 + 8

i) Production control

ii) Dispatching and follow-up.

4. a) Discuss about maintenance management. 16

OR

b) Write notes on : 8 + 8

i) Process of inspection

ii) Work study.

5. a) What is EOQ ? Discuss the factors to be taken into consideration for its determination. 6 + 10

OR

b) Write notes on : 8 + 8

i) ABC analysis Vs. VED Analysis

ii) Periodic Stock-taking and continuous stock taking.

□□

2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Discuss the design and control of production system. 16

OR

b) What is product life cycle ? Explain its various developments. 4 + 12

2. a) What is production planning ? Discuss its alongwith equipment finalisation. 4 + 12

OR

b) Discuss about plant layout. 16

3. a) What is material management ? Discuss how materials are handled in production. 6 + 10

OR

[2]

Review the administration of Shershah.

4. Critically analyse the Rajput Policy of Akbar.

OR

"Shahajahan was the Prince of Builders". Justify.

5. Enumerate the causes of the disintegration of Mughal Empire.

OR

Describe the causes and results of Battle of Plassey.

□□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. Give an assessment of the achievements of Balban.

OR

Evaluate the controversial projects of Md-bin-Tughluq.

2. Make an estimate of Krishna Deva Ray as an able ruler of Vijaya Nagar Empire.

OR

What is Bhakti Cult? Describe the teachings of Saint Kabir.

3. Discuss the contributions of Babur to the foundation of Mughal Empire in India.

OR

[Turn Over

3. a) Explain and examine different criterions of sentence meaning.

OR

b) Critically explain the coherence theory of truth.

4. a) Is Synthetic apriort proposition possible ? Discuss.

OR

b) Explain briefly different types of possibilities. Find out the relationship between them.

5. a) Give an account of the problem of substance.

OR

a) Explain Aristotle's theory of Universal. How far it is different from Plato's view.

V-227-0.2 □□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) State and explain different sense of the word 'meaning'.

OR

b) What is ambiguity ? Explain different types of ambiguity.

2. Explain briefly :

a) Definition by equivalent words.

b) Ostensive definition.

OR

What is concept ? Are all concepts based on sense-experience ?

4. Discuss briefly the status of tribal women in Patrilocal Societies.

OR

Write a note on the economic interpretation of the status of tribal women.

5. Write a brief note on tribal communities of Odisha.

OR

Discuss the problems faced by the tribals in Odisha.

V-228-0.1   □□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. Define tribe and distinguish between caste and tribe.

OR

Write a note on tribal zones.

2. Discuss briefly the clasification of tribal people.

OR

Examine the linguistic diversities among Indian tribes.

3. Discuss the various ways of acquiring males in tribal community.

OR

Discuss the basic functions of tribal family.

V-228   [Turn Over

[2]

3. a) "Wood's Despatch is considered as a significant mile stone in the history of Indian education". Justify.   15

OR

b) Explain the main recommendations of Hartog Committee Report.   15

4. a) Discuss the recommendations of Secondary Education Commission on aims and Curriculum of Secondary education.   7½+7½

OR

b) Discuss in detail the recommendations of Kothari Commission on aims of education and training of teachers.   7½+7½

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Discuss in detail the Salient Features of Vedic Education.   15

OR

b) Give an account of the difference between Vedic and Buddhist system of education.   15

2. a) Discuss how the development of education in medieval India was promoted by State Patronage.   15

OR

b) Describe the aims and methods of teaching of Islamic education prevailed in medieval India.   7½+7½

5. a) Define Validity. Discuss different types of validity with suitable examples. How validity is related to reliability ?

OR

b) A Mathematics Professor has given a test of multiplication to 25 students in a class. Then he induced a state of Anxiety among them and the achievement test was administered. The data are as under :

Initial Test Data	Final Test Data
Mean 72	Mean 70
S.D 5.69	S.D 4.83

The coefficient of correlation between the intial and final test scores is 0.87 (r = 0.87). Findout whether there is a significant difference between two sets of scores ? Did the induction of Anxiety affect the multiplication ability of the students adversely ?

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) What is frequency distribution ? How can you organize data in the form of a frequency distribution ?

OR

b) Calculate Mean, Median and Mode from the following distribution:

SCORES	FREQUENCY(f)
55-59	2
50-54	3
45-49	4
40-44	6
35-39	9
30-34	11
25-29	8
20-24	4
15-19	2
10-14	1
	N = 50

2. a) Define "Variability". Discuss different measures of variability with suitable examples.

OR

b) Find out the Percentile Rank (PR) of the score 68 by direct method from the following distribution.

SCORES	FREQUENCY(f)
80-84	1
75-79	2
70-74	3
65-69	4
60-64	10
55-59	5
50-54	2
45-49	2
40-44	1
	N = 30

3. a) What is a Normal Probability Curve ? Discuss different properties of Normal Probability Curve.

OR

b) Find out the product moment correlation coefficient from the following two sets of scores :.

Subjects	Scores in Test-X	Scores in Test-Y
A	35	69
B	39	72
C	40	71
D	32	60
E	31	73
F	40	74
G	28	64

4. a) A coin was tossed in the air 100 times and the results of these 100 throws indicated 45 Heads and 55 Tails. Using Chi-square Test, find out whether these results are better than mere "Chance".

OR

b) What is Sampling ? Discuss different types of sampling techniques with suitable examples.

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Group-A

1. Write a short note on Utilitarianism.   7½

OR

What is the main theme of Pride and Prejudice ?

2. What are the salient features of a dramatic monologue ?   7½

OR

Write the central idea of the poem 'Fra Lippo Lippi'.

3. What is your idea of Mr.Rochester ?   7½

OR

Comment on Bertha Mason's madness.

4. How does Dickens raise his voice against certain chracteristics of Victorian Society ? 7½

OR

Do you agree with the view that *Hard Times* is a "frontal attack upon the ethics of Capitalism" ?

Group-B

5. 'All Jane Austen's work is transfused with the spirit of classicism in the highest form, in its most essential quality'. Analyse *Pride and Prejudice* in the light of this statement. 12½

OR

Give a character-sketch of Elizabeth.

6. *'Jane Eyre* best shows blending of realism with wish-fulfilment'. Elucidate this observation. 12½

OR

Discuss the relationship between writer and society.

7. Give the significance of the title of the novel *Hard Times*. 12½

OR

Hard Times is a scathing attack on utilitarian philosophy. Explain.

8. Critically appriciate Tennyson's "Ulysses". 12½

OR

Assess Browning's "My Last Duchess" as a dramatic monologue.

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1
which is compulsory

Section-A

1. Answer any *four* of the following :   7½ ×4

   a) Write a brief note on Indian Feudalism.

   b) Discuss the nature and impact of the Arab
      Conquest of Sind.

   c) Assess the consequences of the invasion of
      Md. Shahabuddin of Ghur.

   d) Examine the proliferation of caste in India
      during CE 750-1206.

   e) Give an account of the status of landlords and
      peasants in medieval India.

f) Discuss the condition of maritime trade in medieval India.

g) What were the main features of the medieval Bhakti Cult ?

h) Review the Islamic intellectual tradition in early medieval India.

Section-B

2. Discuss the important sources of information for the study of early medieval India. 12½

3. What were the causes and results of the tripartite struggle for supermacy among the Palas, the Pratiharas and the Rashtrakutas ? 12½

4. Discuss the factors responsible for agricultural expansion in early medieval India. 12½

5. Analyse the main features of inter-regional trade in medieval India. 12½

6. Write a note on the general pattern of urbanization during Post-Gupta period. 12½

7. Write an essay on the rise of Tantrism in early medieval India. 12½

8. Discuss the main features of temple architecture in Northern India. 12½

Group-B

2. State and explain first order necessary and second order sufficient condition of utility maximisation. 12½

3. Formulate Lancaster's attributes of new demand theory. 12½

4. Explain how Hicks has reformulated the doctrine of Consumer's surplus. 12½

5. Formulate Producer's equilibrium in terms of isoquants and Iso-Costline. 12½

6. Explain Cobb-Douglas production function. 12½

7. 'U' shape of SAC is more pronounced. Elucidate. 12½

8. 'LAC is an envelope Curve'. Explain. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Write notes on any *four* of the following : 7½×4

   a) Relationship among AR, MR and e_d.

   b) Prove that rate of fall in MR curve is twice the rate of fall in AR curve.

   c) Composite Commodities

   d) Attributes of Goods and implicit Prices.

   e) Economies of Scope

   f) Short-run supply by Price taking firms.

   g) Rate of Technical substitution

   h) Constraint Profit maximisation model.

Group-B

2. Discuss the meaning and scope of Comparative Politics. 12½

3. What does it mean to go beyond Euro-Centrism? Discuss the Origin of Eurocentrism. 12½

4. Discuss the Basic features of Capitalism. 12½

5. "Socialism is like a hat which has lost its shape, because everybody wears it". Examine. 12½

6. What is Globalisation? Put your arguments in favour and against Globalisation. 12½

7. Define Colonialism. Discuss the impacts of Colonialism. 12½

8. Explain the causes of rapid De-Colonialisation. 12½

9. Analyse the various steps for the Constitutional Developments in Great Britain. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Write short notes on any *four* of the following : 7½×4

   a) Nature of the Comparative Politics.

   b) Impacts of Globalisation on the functions of the state.

   c) Features of Socialism.

   d) Growth and Development of Capitalism.

   e) Forms of Colonialism.

   f) Process of De-Colonialisation.

   g) Anti-Colonialism Struggles.

   h) Constitutional Developments in China.

[2]

b) Examine the working of Direct Democracy in Switzerland.

4. a) Describe the Constitutional Development of China since 1949.

OR

b) Explain the powers and functions of the State Council of China.

5. a) Discuss the nature and working of political parties in Switzerland.

Or

b) Examine the role of Communist Party in China.

V-133-0.3 □□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Explain the importance of Conventions in the British Constitution.

OR

b) Account for the Survival of Monarchy in Great Britain.

2. a) Analyse the Federal features of American Constitution.

Or

b) Discuss the Powers and Position of American President.

3. a) Describe the composition and functions of the Federal Tribunal of Switzerland.

OR

L-233   [Turn Over

Group-B

2. Define Social research and discuss the major steps in Social research.

3. Explain descriptive research design.

4. Define hypothesis and discuss the role of hypothesis in Social research.

5. Discuss briefly various types of non-probability Sampling.

6. Define observation and discuss briefly its various types.

7. Define case study and discuss its merits.

8. 'Interview is a tool par excellence'. Comment.

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Answer any *four* of the following :

   a) Define Social research and discuss briefly its nature.

   b) Discuss the need of research design in Social research.

   c) Discuss briefly the characteristics of hypothesis.

   d) Discuss the characteristics of Sampling.

   e) Write a brief note on participant observation.

   f) Discuss briefly the demerits of questionnsire.

   g) Write a brief note on interview schedule.

   h) Define Mean and discuss its merits.

Group-B

2. Explain the nature of Proposition and distinguish it from sentence. 12½

3. Find out the relation between deduction and induction. 12½

4. Explain with example the traditional square of opposition. 12½

5. What is a categorical syllogism ? How is its figures and moods determined ? 12½

6. Determine that the mood EIO is valid and IEO invalid in every figure. 12½

7. What is indirect reduction ? Reduce the mood OAO of the third figure indirectly. 12½

8. What Constitutes the Proof of a hypothesis ? Discuss. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Write notes on any *four* of the following : 7½ ×4

   a) What is deductive argument ? How does it differ from inductive argument.

   b) Explain with example the Law of Eucluded middle.

   c) What is Catogorical Proposition ? How does it differ from Conditional Proposition.

   d) Is sub-alternation a form of opposition of Proposition ?

   e) What is material observation ? Explain with example.

   f) What is illicit process of miner term ?

   g) Reduce 'DISAMIS' directly.

   h) What are the conditions of a proper hypothesis.

3. a) What is investment function ? Discuss the factors which determine its shape and position.

OR

b) Examine the permanent income hypothesis with its limitations ?

4. a) Explain the accelerator theory of investment. What are its limitations ?

OR

b) How an investment multiplier works ? Discuss its effectiveness in LDCs.

5. a) Discuss the liquidity preference theory of interest. Is it indeterminate ?

OR

a) How IS-LM model determines equilibrium rate of both interest and income ?

V-225-0.3   ▢▢

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) What are the components of National Income in an open economy ? How do you distinguish between GNP and NNP at market price ?

OR

b) Explain the concept to Green Accounting. Discuss its importance in Social Accounts.

2. a) Make a critical appreciation of the Classical Macroeconomics.

OR

b) "Saving and investment are always equal but these two are in equlibrium only at the level of income". Explain.

[4]

c) Moving of the earth Brings harms and fears,

Men reckon what it did and meant,

But trepidation of the spheres,

Though greater far, is innocent.

OR

Love, all alike, no season knows, nor clime,

Nor hours, days, months, which are

the rags of time

V-132-0.2   ▢▢

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Fill in the blanks :   1 × 7

a) 'An Essay of Dramatic Poesy' was writen by_____ .

b) The Restoration period began in_____ .

c) Richard Steele's_____ is a Sentimental Comedy.

d) Dr. Johnson's *Preface to Shakespeare* is a_____.

e) 'The History of Tom Jones' was written by_____.

f) Richardson's 'Pamela' is an_____ novel.

g) _____ is an example of Gothic Novel.

2. Write short notes on any *four* of the following : 4×4

a) Periodical Essays in 18th Century England.

b) Restoration Comedy

c) Neoclassicism

d) Roles of Clubs and Coffee houses in 18th Century England

e) Poetic Diction in the Augustan Age.

f) Swift's Contribution to Satire.

3. Comment on the Fool's character and function in "King Lear".   14

OR

Sketch the development in Lear's character from an egotistical monarch to a Loving human Soul.

4. What features of Shakespearean Comedy do you find in 'Twelfth Night' ?   14

OR

Make an assessment of Olivia as a Shakespearean heroine.

5. What do you mean by Metaphysical Conceits ? Discuss with references to the poems of John Donne which you have read.   14

OR

Give a critical appreciation of 'The Collar' or 'The Retreat'.

6. Annotate the following :   3 × 5

a) You do me wrong to take me out of the grave, Thou art a Soul in bliss ; but I am bound upon a wheel of fire, that mine own tears Do scald like molten lead.

OR

Have more than thou showest

Speak less than thou knowest,

Lend less than thou owest

Ride more than thou goest'.

b) Fear not, Cesario, take thy fortunes up ;

Be that thou Know'st thou art, and then thou art

As great as that thou fear'st.

OR

A murd'rous guilt shows not itself more soon

Than love that would seem hid : love's night

is noon.

[2]

b) Differentiate between population geography and demography.

4. a) What is fertility ? Discuss the determinants of fertility.

OR

b) Write short notes on :

i) Mortality

ii) Sex Structure.

5. a) Account for the origin and growth of rural settlement.

Or

b) Give an account of the Functional Classification of cities.

V-134-0.1   ⬜⬜

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Write the contribution of Ritter for the development of Geography.

OR

b) Discuss the dichotomy in geography in the context of Determinism Vs. Possibilism.

2. a) Define and discuss the scope of human geography.

Or

b) Write short notes on :

i) Concept of state

ii) Heart land.

3. a) Give brief account of the sources of population data.

OR

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. Following balances appeared in the books of a Company on 1st April 2015

12% Debentures	₹8,00,000
12% Debentures Sinking Fund	₹6,00,000
12% Debentures Sinking Fund Investments	₹6,00,000

(Represented by 10% Government Bonds secured of ₹7,20.000)

Annual Contribution to sinking fund was ₹1,28,000 made on 31st March every year. On 31st March 2016 balance at bank was ₹4,00.000 before receipt of interest. The company sold the investments at 80% and debentures were paid up (repaid)

You are required to prepare

i) 12% Debentures A/c

ii) Debenture Sinking Fund A/c

iii) Debenture Sinking Fund Investment A/c

iv) Bank A/c..

OR

a) Pass Journal Entries for the following transactions :

   i) Issue of debentures at a discount and redeemable at par

   ii) Issue of debentures at a premium and redeemable at par

   iii) Issue of debentures at par and redeemable at premium

   iv) Issue of debentures at discount and redeemable at premium.

b) What do you mean by Capital Redemption Reserve Account ? How is it Created ? How can it be utilised ?

2. Prepare a form of Balance Sheet of a Company as per Companies Act 2013, taking imaginary figures.

Or

Write notes on the following :

a) Miscellaneous Expenditure to the extent not written of.

b) Requirements of True and Fair.

c) Contingent liabilities.

3. Explain pooling interests method of amalgamation.

Or

The Balance Sheet of a private company stood as follows on 31-3-2016

Balance Sheet

Liabilities	₹	Assets	₹
19,000 shares of ₹100 each	19,00,000	Land/Buildings	1,00,000
Creditors	1,00,000	Machinery	2,60,000
Debentures	1,00,000	Furniture	20,000
		Stock	3,70,000
		Debtors	1,80,000
		Goodwill	2,00,000
		Profit & loss A/C	9,70,000
	21,00,000		21,00,000

The company is to be reconstructed as follows :

i)   Share of ₹100 are to be reduced to an equal number of fully paid shares of ₹40 each.

ii) To issue 1,000 new shares of ₹40 each as fully paid up to debenture holders in full settlement.

iii) The amount available is to be utilised in writing off the goodwill and Profit & Loss A/c and the balance in writing down the value of machinery.

iv) Authorised Capital of the Company is 20,000 shares of ₹100 each.

Give the necessary journal entries. Prepare Capital Reduction A/c and Reconstructed Balance Sheet.

4. Write notes on the following :

a)   Liquidation Financial statement of account

b)   Blist of Contributories.

OR

The Share Capital of XY Ltd. Consists of 10,000 Equity Shares of ₹100 each, ₹50 paid and 2,500 8% Cumulative preference shares of ₹100 each fully paid. The Balance sheet of XY Ltd ; shows assets (exclusive of goodwill) ₹15,00,000 ; Liabilities ₹4,00,000 ; Reserves ₹3,50,000 and paid up capital ₹7,50,000 ; The profits before tax of XY Ltd. for the previous five years were ₹1,00,000, ₹3,00,000, ₹500, ₹2,00,000 and ₹4,45,000. Rate of tax is 50%.

The assets and liabilities are accepted at Balance Sheet figures and there are no arrears of dividend on preference shares which in similar business yield a return of 6% under current market conditions. The normal yield on capital employed in similar business is 10% and goodwill is valued at five times the purchase price of the super profit.

You are asked to value the preference shares and the equity shares in XY Ltd. Assume tax rate is 50%.

5. From the Balance Sheets given below, you are required to prepare Funds Flow Statement :

Balance Sheets as on 31st March.(₹ in lakhs)

Liabilities	Previous year (₹)	Current year (₹)	Assets	Previous year (₹)	Current year (₹)
Equity share capital	8.00	12.00	Free hold Land & Building	5.54	11.32
Security Premium	0.80	1.20	Plant & Machinery	3.56	5.13
General Reserve	0.60	0.90	Furniture/Fitting	0.24	0.15
Profit/Loss A/c	1.95	2.08	Stock	2.21	2.60
5% Debentures	--	2.60	Debtors	3.65	3.91
Corporate tax	0.98	1.09	Bank	0.48	0.40
Creditors	3.35	3.64			
	15.68	23.51		15.68	23.51

Depreciation written off during the year :

Planted Machinery   ₹1.28 lakhs

Furniture and Fittings   ₹0.04 lakhs

OR

Write notes on the following :

a) Cost of control

b) Treatment of unrealised profit

c) Minority Interest.

□□

[4]

f) Prove the following relation using gamma or beta function.

$$\int_0^1 \frac{x^2\,dx}{(1-x^4)^{1/2}} \times \int_0^1 \frac{dx}{(1-x^4)^{1/2}} = \frac{\pi}{4\sqrt{2}}$$ 6

5. a) Describe Michelson-Morely experiment with necessary theory and write down the conclusion drawn from it.   11 + 4

OR

b) Derive Einstein's mass-energy relation.   10

c) Write energy momentum four vectors.   5

□□

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Show that :

$$\vec{A} \times (\vec{B} \times \vec{C}) + \vec{B} \times (\vec{C} \times \vec{A}) + \vec{C} \times (\vec{A} \times \vec{B}) = 0.$$ 5

b) Calculate grad $\left(\dfrac{1}{r}\right)$ 3

c) Find the vector perpendicular to surface

$x^2 + 2y^2 + 3zx = 4$ at point (1, 2, 0).   4

OR

d) Derive Gauss divergence theorem.   5

e) Discuss the physical significance of gradient.   4

f) Find Curl $\vec{A}$ where $\vec{A} = \vec{r}$ $f(r)$ 3

[Turn Over

2. a) State and prove Cauchy-Riemann conditions.   10

   b) Prove that $x^2 + iy^3$ is not analytic any where in the z-plane   5

Or

   c) State and prove Laurent series expansion for an analytic function.   10

   d) Expand $\dfrac{e^{2z}}{(z-1)^3}$ around $z=1$.   5

3. a) Obtain the series solution of Hermite's differential equation.   10

   b) Show that $H_n(x)=(-1)^n\ e^{x^2}\ \dfrac{d^n}{dx^n}\ (e^{-x^2})$ 5

OR

   c) Show that Legender Polynomial $P_n(x)$ is the coefficient of h^n in the binomial expansion of $(1 - 2xh + h^2)^{-\frac{1}{2}}$.   8

   d) Find the value of $P_3(x)$.   3

   e) Prove the following relation :

   $(n+1)\,P_{n+1}^{(x)} = (2n+1)\,x\,P_n^{(x)} - n\,P_{n-1}^{(x)}$ 4

4. a) Expand $f(x)$ using Fourier Series in the interval $(-2, 2)$ if $f(x) = 0$ for $-2 \le x \le 0$ and $f(x) = 1$ for $0 \le x \le 2$.   8

   b) Find Fourier transform of Gaussian distribution function $f(x)=A\,e^{-\beta x^2}$ where A and β are constants.   4

   c) Show that Dirac delta function in coordinate space has a constant value in momentum space.   3

OR

   d) Find Laplace transform $\{t^n\}$.   4

   e) Find the value of $\sqrt{\left\lceil\dfrac{1}{2}\right\rceil}$.   5

5. a) Write notes on the following :

    i) Claisen rearrangement.   4

    ii) Reaction of phenol with benzene diazonium chloride   3

    iii) Synthesis of epoxides.   3

OR

b) Write the mechanism of Reimer-Tiemann reaction.   4

c) Complete the following reactions.   2 + 2

    i) Glycerol dil $\xrightarrow{HNO_3}$

    ii) Glycerol $\xrightarrow{PCl_5}$

d) Why is phenol acidic ?   2

6. a) Discuss the mechanism of the following reactions :

    i) Benzoin Condensation   4

    ii) Clemenson's reduction   3

    iii) Baeyer-villager oxidation of Ketones.   3

OR

b) Write notes on the following :

    i) Aldol Condensation   3½

    ii) Perkin reaction.   3½

c) How does acetaldehyde react with phenyl hydrazine   3

III-UG-Chem (H)-V

(Back)

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. a) Thermodynamically derive an expression relating the elavation of boiling point of a solution and molecular mass of the non-volatile and non-electrolytic solute dissolved in it.   7

b) 10g of a non-volatile solute dissolved in benzene raises the boiling point by 1^0C. Calculate the molecular mass of the solute. (K_b for benzene 2.53 K.mol^{-1}).   3

OR

c) Write a note on Raoult's law.   4

d) What is colligative property ? Prove that lowering of vapour pressure is a colligative property.   1 + 2

e) Give an account of abnormal molecular mass.   3

2. a) Explain extensive and intensive properties of a system with two examples of each.   4

   b) Derive an expression for the work done in an isothermal reversible expansion of an ideal gas from volume V_1 to V_2.   6

   OR

   c) What is Joule-Thomson effect ? Derive an expression for the Joule Thomson co-efficient of an ideal gas.   1½ +4½

   d) Define bond dissociation energy. Calculate the C– C bond energy, given that

   heat of sublimation of C = 170.9Kcal

   heat of dissociation of H_2 = 52.1 Kcal

   C – H bond energy = 99 Kcal

   heat of formation of ethane = 20.39 Kcal.   1+3

3. a) Write short notes on any *two* of the following : 5+5

   i) Hydrides of nitrogen

   ii) Bacterial fixation of nitrogen

   iii) Interhalogen compounds.

   OR

   b) Discuss one method of preparation, two chemical properties and the structure of any two of the following compounds.   (1+2 +2) × 2

   i) Xe O_2F_2 (ii) Xe F_4 (iii) XeO_4.

4. a) Write the IUPAC name of the following complex componds.   4

   i) $[Co(NH_3)_6] Cl_3$ (ii) $[Cr(en)_3] Cl_3$

   iii) $[Cr(H_2O)_4Cl_2]$ (iv) $K[PtCl_3(NH_3)]$

   b) Calculate the co-ordination number of   2

   i) Ni in $[Ni(CO)_4]$

   ii) Fe in $K_4[Fe(CN)_6]$

   c) Discuss the geometrocal isomerism in complex compounds with co-ordination number six.   4

   OR

   d) Write the postulates of Werner's theory of co-ordination componds. Explain the structure of $[Co(NH_3)_4] Cl_3$ on the basis of this theory.   4 + 3

   e) What do you mean by effective atomic number of a central metal ion ? Calculate the effective atomic number of the metal 'Fe' in $[Fe(CN)_6]^{3-}$ ion.   3

3. Give an account of Genetic engineering and Recombinant DNA.

OR

Write notes on the following :

a) Gene Bank

b) Protoplast fusion.

4. Describe different methods of plant breeding.

OR

Write notes on the following :

a) Hybridization in self pollinated crops

b) Hybrid vigour.

5. Give an account of mean, median measurement of Dispersion with examples.

OR

Write notes on the following :

a) Standard deviation

b) Random sampling.

□□

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Give labelled diagrams wherever necessary.

1. Give an account of the Mendel's laws of inheritance.

OR

Write notes on the following :

a) Crossing over

b) Epistasis.

2. Describe the different types of gene mutation.

OR

Write notes on the following :

a) Down's syndrone

b) Chromosomal aberrations.

3. Describe principal anatomical structures of sphenodon and discuss its affinities.

OR

Write notes on any *two* of the following :

a) Diapsida

b) Neoteny

c) Snake venom.

4. Give an account of the flight adaptations in birds.

OR

Write notes on any *two* of the following :

a) Respiratory system in Pigeon

b) Prototheria

c) Heart of Rabbit.

5. Give a comparative account of Aortic arches in Vertebrates.

OR

Write notes on any *two* of the following :

a) Metanephros

b) Brain of Mammal

c) Heart of Fishes and Amphibia.

2016

Full Marks - 60

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Draw suitable diagrams wherever necessary.

1. Describe the digestive system and feeding mechanism of Amphioxus.

OR

Write notes on any *two* of the following :

a) External features of Herdmania

b) Development in Balanoglossus

c) Structural peculiarities of Protochordates.

2. Give an account of the structural peculiarities and affinities of cyclostomes.

OR

Write notes on any *two* of the following :

a) Heart of Scoliodon

b) General characters of Dipnoi

c) Accessory repiratory organs of fishes.

2016

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Draw a flow chart to find out the greatest among 10 input numbers.   6

   b) Differentiate between an algorithm and a flow chart. Write an algorithm to find out the first ten Fibonacci numbers.   6

   OR

   Write short notes on the following :   12

   a) GIGO

   b) Top-down Vs. Bottom-up Design

   c) Modular Design Vs. Structured Programming

   d) Algorithm Vs. Flowchart.

[Turn Over

2. a) What are the different operators available in C language ? Explain with examples.   12

OR

   b) What are the different decision control and branching statements available in C ? Explain about each of them with suitable examples. 12

3. a) Write a program in C to find out the factorial of a number using Recursion.   6

   b) What is meant by function ? What are the different ways of passing parameters to the function ? explain with suitable example.   6

OR

   c) What is the different between call-by-value and call-by-reference ? Write a program in C to find out largest among three numbers using pointer.   6

   d) Explain the concept pointer to pointers with a suitable example.   6

4. a) Differentiate between Single, Double and Circular Linked list with their advantages and disadvantages ? Write an algorithm in C to insert an element in to single linked list.   12

OR

Write short notes on the following :   12

a) Polynomials using list

b) Abstract Data Type

c) Linear Vs. Binary Search

d) Representation of Sparse Matrix.

5. a) Covert the following infix expression in to its postfix form by using a stack.

   $A * B - (C / D - E) \wedge 5$ 6

   b) What is stack ? How does it differ from a queue ? Explain PUSH operation in stack with example.   6

OR

   c) Draw a binary tree for the following expression and find out its pre-order traversal expressions.

   $E = (3x - y) (5a + b) - 4a.$ 6

   d) Differentiate between queue and circular queue. Write the Insertion algorithm in queue with example.   6

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1
which is compulsory

Group-A

1. Answer any *four* of the following :

   a) Define adiabatic process. Deduce its equation
      of state.   1 + 5

   b) Distinguish between reversible and
      irreversible process. Give examples of both
      the processes.   3 + 3

   c) i) What do you mean by isobaric change ?
         Draw its PV diagram.   2

      ii) State and write mathematical the law of
          equipartition of energy

      iii) Derive mean free path. How does the mean
           free path varies with density of a gas ?   2

[Turn Over

d) What do you mean by a heat engine ? Derive its efficiency in terms of quantity of heat.   3 + 3

e) Derive first Tds equation.   6

f) Deduce thermodynamical scale of temperature.   6

g) Write Maxwell Boltzmann formula for distribution of molecular speed and hence obtain the expression for rms speed.   2 + 4

h) Deduce expressions for critical constants υ_c and T_c.   3 + 3

Group-B

2. Describe the construction and working of a Carnot engine. Derive an expression for its efficiency. 7+2

3. Show that the entropy remains constant in a reversible cycle but increases in an irreversible cycle.   9

4. Draw T-S diagram for a Carnot's cycle and hence obtain an expression for its efficiency.   3 + 6

5. Give an account of the thrmodynamical treatment regarding the cooling due to adiabatic demagnetization.   9

6. Deduce Claussius-Clayperon's equation in the light of first order phase transition.   9

7. Deuce Maxwell's thermodynamic relations.   9

8. What is Brownian motion ? Give a brief account of Einstein's theory of Brownian motion.   9

c) Write notes on Cannizzaro's reaction.   6

d) Why acetic ester fails to give haloform reaction ?   3

7. a) How is diethylmalonate synthesised ? How succinic acid is obtained from diethylmalonate ?   6

b) Write short notes on Curtius rearrangement. 3

OR

c) How 2-butanone and crotonic acid can be synthesised from diethylmalonate.   6

d) Write on Reformatsky reaction.   3

8. a) Write notes on :   9

i)   Dieckmann reaction

ii) Hofmann Bromamide Degradation.

OR

b) Write notes on :   9

i)   Knoevenegel condinsation

ii) Wittig reaction.

Group-A

1. a) Suggest the reactant for preparing the following from $CH_3.Mg.Br$.   6

i) $CH_3 CH_2.OH$

ii) $CH_3-\overset{\overset{S}{\|}}{C}-SH$

iii) $CH_3-\overset{\overset{O}{\|}}{C}-OH$

iv) $CH_3.D$

OR

b) Identify A, B, C in the sequence of the following reaction :   4

$$C_6H_5.Br + Li \longrightarrow A \xrightarrow{CH_3-\overset{\overset{O}{\triangle}}{CH}-CH_2} B \xrightarrow{H_3\overset{+}{O}} C$$
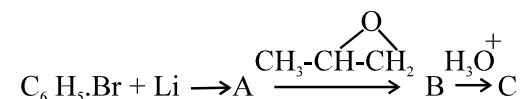
c) Predict the product   2

$$\underset{\text{liq NH}_3}{\overset{\text{Na NH}_2}{\longrightarrow}}$$
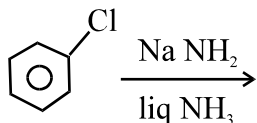
2 a) Explain why are vinylic and arylhalides unreactive in SN_1 or SN_2 reactions ?   4

b) Explain why $HO - CH_2 - CH_2 - Br$ does not form Grignard reagent ?   2

OR

c) Neopentyl halides do not undergo nucleophilic substitution reactions, Explain ?   4

d) Are SN_2 reactions stereospecific or Stereoselective ?   2

3. a) Discuss Pinacol-Pinacolone rearrangement with mechanism.   4

b) Why phenol is acidic ?   2

OR

c) What is Lucas reagent ? How it is used to distinguish 1^0, 2^0, and 3^0 alcohol ?   4

d) $\underset{CH_2 - OH}{\overset{CH_2 - OH}{|}} \xrightarrow{\underset{HIO_4}{Oxd^n}}$ 2

4. a) Discuss Reimer-Tiemann reaction with mechanism.   4

b) Why aniline is less basic than ethyl amine ?   2

OR

c) Discuss Claisen condensation with mechanism.   4

d) Why acetoacetic ester fails to give haloform reaction.   2

Group-B

5. a) Dialkyl ethers are most easily cleared by HI and less easily by HBr or HCl. Explain   6

b) Benzoin condensation is not possible with aliphatic aldehydes. Explain.   3

OR

c) Write notes on Wolf-Kishner Reduction.   6

d) Oxime of benzaldehyde does not give normal Beckmann rearrangement product. Explain.   3

6. a) Write a note on Bayer-Villiger oxidation.   6

b) Explain why in Perkin reaction, one should use the anhydride and the sodium salt of the same acid as reagents.   3

OR

[Turn Over

Group-B

2. Briefly explain the concept of centres of origin with reference to Vavilov's work.   9

3. Describe the origin, morphology, processing and uses of rice.   9

4. Give an account of the morphology, processing, uses and health hazards of tobacco.   9

5. Explain the extraction methods of essential oils.   9

6. Explain the tapping, processing and uses of para-rubber.   9

7. Describe the morphology, propagation and uses of potato.   9

8. Give an account of the morphology, processing and uses of tea.   9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Write notes on any *four* of the following :   6 × 4

   a) Crop domestication

   b) Importance of germplasm diversity

   c) Importance of legumes to man and ecosystem.

   d) Economic importance of blackpepper

   e) Extraction and uses of groundnut

   f) Cinchona

   g) Timber plant : Teak

   h) Uses of cotton

Group-B

2. Give the classification, structure and function of Epithelial tissue.   9

3. Give an account of the originated propagation of action potential along a nerve fibre.   9

4. Give an account of the molecular and chemical basis of Muscle contraction.   9

5. Describe the structure and function of Mammalian Ovary.   9

6. Discuss the mechanism of Hormone action by steroid and non-steroid Hormones.   9

7. What is nervous tissue ? Describe the structure and function of its components.   9

8. Describe the structure and function of adenohypophysis   9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1
which is compulsory

Group-A

1. Write notes on any *four* of the following : 6×4

   a) Areolar tissue

   b) Reflex action

   c) Sarcomere

   d) Puberty in males

   e) Pancreas as endocrine gland

   f) Histology of adrenal

   g) Methods of Contraception

   h) Organ of Corti

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1
which is compulsory

Group-A

1. Answer on any *eight* of the following :   3 × 8

    a) What are the Advantages of DBMS ?

    b) Write a note on Database Actors.

    c) Differentiate between Secondary Key and Candidate Key.

    d) Discuss Division and Join operation with example.

    e) What is meant by view ?

    f) Write a note on Schema with example.

    g) What do you mean by UML diagrams ?

h) What is meant by Hashing ?

i) Compare and contrast UNF with 4NF.

j) What is Indexing ?

Group-B

2. a) Compare and Contrast ER Model with EER Model.   3

b) Write a note on Database User.   3

c) Write a note on Database Architecture.   3

3. a) Differentiate Weak Entity from Strong Entity. 3

b) What is ER Model ? Describe the symbols used for ER modelling in details.   3

c) Write a note on disadvantages of DBMS.   3

4. a) Differentiate Relational Calculus from Relational Algebra.   3

b) Write a note on Relational Algebra operations with Examples.   2

c) Discuss Key and its types with examples.   3

5. a) Differentiate Project Operation from Select Operation.   3

b) Differentiate Tuples from Attributes.   3

c) What do you mean by Attributes and Domains ? Justify your answer with suitable example.   3

6. a) With suitable example, discuss ER to Relational Mapping.   3

b) Write a note on DDL with example.   3

c) Write a note on Query with example.   3

7. a) With a suitable example, discuss 1NF, 2NF and 3NF.   6

b) Compare and Contrast 3NF with BCNF.   3

8. a) Write a note on Disk Structure.   3

b) Write a note on File structure.   3

c) Write a note on Hashing.   3

5. a) Let K be a subgroup of G and N is a normal subgroup of G Prove that K/K ∩ n is isomorphic

   to $\dfrac{KN}{N}$. 8

   b) Let ϕ be a harmomorphism from a group G to a group $\overline{G}$ and g ∈ G Prove that   4 + 4

   i) If | g | is finite then | ϕ (g) | divides | g |

   ii) ϕ(a) = ϕ(b) iff a ker ϕ = b ker ϕ for a, b ∈ G

   Or

   c) Define Kernel of a homomorphism of groups. Suppose ϕ be a group homomorphism from G to $\overline{G}$. Prove that ker ϕ is a normal subgroup of G   8

   d) Let ϕ be a homomorphism from a group

   i) Prove that if $\overline{K}$ is a normal subgroup of $\overline{G}$ then $\phi^{-1}(\overline{K}) = \{K \in G \,|\, \phi(K) \in \overline{K}\}$ is a normal subgroup of G   4

   ii) Prove that the mapping ϕ from R* to R* defined by ϕ(x) = | x | is a homomorphism. Find its Kernel.   4

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer **all** questions selecting either {(a), (b)} or {(c), (d)} from each question

Symbols used have their usual meaning.

1. a) i) Prove that centre of a group is a subgroup of G   4

   ii) Let G be an abelian group and H and K are subgruops of G Prove that HK is a subgroup of G   4

   b) For any element a and from a group and any integer n prove that $(a^{-1}ba)^n = a^{-1}b^n a$.   8

   OR

   c) i) Prove that U(10) is a group.

   ii) Prove that in a group G $(ab)^{-1} = b^{-1}a^{-1}$ for a, b, ∈ G   4

   d) Suppose H be a non empty finite subset of a group G If H is closed under multiplication, prove that H is a subgroup of G   8

2. a) i) Prove that every subgroup of a cyclic group is cyclic. 4

   ii) Let G be a group and $a \in G$ Prove that $\langle a \rangle = \langle a^{-1} \rangle$. 4

   b) Define alternating group of degree n. Prove that for $n > 1$ A_n has order $\dfrac{n!}{2}$. 8

   OR

   c) Let G be a group and $a \in G$ If a has finite order n, prove that 8

   $\langle a \rangle = \left\{ e, a, a^2 ..... a^{n-1} \right\}$ and $a^i = a^j$ iff n divides $i - j$

   d) Prove that every permutation of a finite set can be written as a cycle or as a product of disjoint cycles. 8

3. a) Let H be a subgroup of G and $a, b \in G$ prove that.

   i) aH is a subgroup of G iff $a \in H$. 4

   ii) $aH = bH$ or $aH \cap bH = \phi$ 4

   b) State and prove Lagranges theorem. 8

   OR

   c) i) Let H and K are subgroups of G and $g \in G$ show that $g(H \cap K) = gH \cap gk$. 4

   ii) If G is a finite group and H is a subgroup of G then prove that $|G : H| = |G| / H|$. 4

   d) Let H and K are two finite subgroups of G Prove that $|HK| = \dfrac{|H|.|K|}{|H \cap K|}$. 8

4. a) Define external direct product of n groups. Prove that the external direct product of any finite number of groups is a group. 8

   b) If N and M are normal subgroups of G prove that NM is also a normal subgroup of G 8

   OR

   c) Prove that factor group of a cyclic group is cyclic. 8

   d) Let G be a finite abelian group and p be a prime that divides order of G Prove that G has an element of order p. 8

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Fill in the blanks with the right form of modals keeping in mind the meaning given in brackets..   5

    i) She_____ go for an operation.(certainty)

    ii) I_____smells omething burning.(Awareness)

    iii) _____ you kindly get me a dozen of paper ?   (Request)

    iv) I_____ never play the flute. (Past ability)

    v) _____ I clean your room ? (Offer of help)

   b) Rewrite the following sentence using the correct forms of verbs given in brackets.   5

    i) The river (smell) when it rains.

    ii) He (sit) idly while others were playing in the field.

[2]

iii) The boys (finish) eating.

iv) When we reach Simla it (snow) there.

v) He (pay) a heavy penalty for his crime in future.

c) Fill in the blanks with suitable preposition.   5

i) The thief robbed him _____ his money.

ii) He complied _____ my request.

iii) He refrained _____ commenting on the situation.

iv) The bus is bound _____ Cuttack..

v) She is never exposed _____ bright light.

d) i) Write the synonym of the following :   5×½
Abandon, Brutal, Hazard, Decease, Twist

ii) Write antonym of the following :   5 × ½
Social, Ability, Judge, Sensitive, Beginning

[3]

e) Do as directed :   5

i)   The house in on fire (Change the voice)

ii) Let us go on a picnic. (Add a question tag)

iii) Time and tide wait for none (Correct the error)

iv) He was elected captain of the team
(Change the voice)

v)   He is _____ teacher (Use appropriate article)

2. Read the following passage and answer the questions that follow in brief.   5 × 2

The Internet has revolutionized the world like no other technology before it. The Internet, or the Net, as it is better known, has been perceived to be of several dimensions to its users : a medium of inter communication between remote users ; a mechanism to show information, and work collaboratively ; a means of publishing information globally ; and a near-exhaustive repository of information.

The Internet is a good example of the synergy of convergence of technologies. While the individual technologies behind the Internet have been around for some time, the explosive growth and penetration of the Net has been achieved only with the covergence of the underlying technologies of mass production of computers ; developments in computer-networking ; the growing availability and declining costs of telecommunication services ; and advancements in data compression and transmission.

Questions :

i) How is Internet perceived by its users.

ii) Why does the writer call the Internet synergy of convergence of technologies ?

iii) How has the cost of telecommunication services reduced ?

iv) How is Internet known to common people ?

v) What is the most significant aspect of Internet you find in the passage ?

3. Write a paragraph on any *one* of the following :   12

    i)   A stitch in time saves nine

    ii) Journey by train

    iii) Demonetization.

4. Write a precis of the passage given in Question No.2 and add a title.   12

5. a) Answer any *four* of the following :   5 × 4

    i)   What does Kalam say about his study of aeronautics at the MIT ?

    ii) What does the writer mean by "Shehnai transcends all musical categories" ?

    iii) How does Capra appreciate Sanjukta Panigrahi's performance on the stage ?

    iv) What impresses the Boss most at Shamnath's house?

v) What is meant by 'sane society' ? How according to Eric Fromm can a sane society be built ?

vi) What is the significance of collective art in social life ?

b) Write a critical appreciation of any *one* of the following : 16

i) Ode on a solitude

ii) The Darkling Thrush

iii) The Unknown citizen.

c) Write an annotation of the following with reference to context 10

Love's not Time's Fool, though rosy lips and cheeks
Within his bending sickle's compass come ;
Love alters not with his brief hours and weeks,
But bears it out even to the egde of doom.

OR

"And vital feeling of delight
Shall rear her form to stately height,
Her virgin bosom swell ;
Such thoughts to Lucky I will give......."

Group-B

2. Discuss the essential elements of a valid contract.   12½

3. Explain the provisions of law relating to contracts by minors.   12½

4. State and explain the circumstances under which a surety is discharged.   12½

5. Narrate the various modes by which an Agency may be created.   12½

6. When is a seller of the goods deemed to be an unpaid seller ? What are the rights against the goods and the buyer personally ?   12½

7. "A holder in due course gets a title free from equities". Explain the statement and discuss the various privileges of a holder in due course.   12½

8. "Memorandum of association is a charter of the company". Comment upon the statement and explain the clauses which are included in a memorandum of association of a company.   12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following :   7½ × 4

   a) "No consideration no contract"– Exceptions to this rule, Explain.

   b) What do you mean by Coercion ? Explain.

   c) Write a note on discharge of contract by operation of law.

   d) What are the essentials of bailment ?

   e) Difference between a condition and warranty.

   f) What are the features of a promisory note ?

   g) Distinguish between Cheque and Bill of exchange.

   h) What are the characteristics of company ?

b) What are Lissajous figures. Give an analytical treatment of two simple harmonic motions having same time period acting at right angle to each other and hence draw Lissajous figures for different cases. 2 + 8 + 5

4. a) Define entropy. What is its physical significance. Show that entropy remains constant in a reversible process but increases in an irreversible process for a perfect gas. 3 + 6 + 6

OR

b) Define thermodynamic potentials and hence deduce Maxwell's thermodynamical relations. 5+10

5. a) Write down the formula for Maxwell-Boltzmann distribution of velocities and hence derive the expression for average speed of the molecules of a gas. 2 + 6

b) State and explain law of equipartion of energy. 7

OR

c) Explain degrees of freedom. 5

d) Define mean free path and obtain an expression for it. 3 + 7

□□

2016

Full Marks - 75

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Derive Kepler's laws of planetary motion. 15

OR

b) What do you mean by moment of inertia and find out the expression for radius of gyrasion. Derive the expression for moment of inertia of a solid sphere about its diameter. 2 +3 + 10

2. a) Establish relation among elastic constants. 15

OR

b) Differentiate between surface tension and surface energy. Derive expression for excess pressure inside a soup bubble. 5 + 10

3. a) Define forced vibration. Establish its differential equation and solve it. Find the expression for amplitude resonance. 2+2+8+3

OR

b) Write synonym of the following words.   5

Abandon, Forbid, Generous, Humility, Death, Confess, Heroic, Rigid, Obstinate, Wrath.

c) Write short notes on any *four* of the following with suitable examples :   5

i) Modal Auxilary

ii) Conditional clause

iii) Preposition.

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Write a note on various forms of communication with suitable examples.   20

OR

b) Write a note on the following in about 100 words each :   20

i) Body language

ii) Barriers of Communication.

2. a) Write a note on Oral communication skills. 20

OR

b) Write short notes on the following in about 100 words each :   20

i) Group Discussion

ii) Interview skills.

3. a) Design a CV to be submitted to the HR Manager of a firm for the post of an Accounts Assistant. 20

OR

b) What are the various forms of written communication ? Explain with suitable examples.

4. Write short notes on any *four* of the following in about 50 words each. Give suitable examples.: 4×5

i) Syllable division

ii) Word stress

iii) Intonation

iv) Phnetic transcription

v) Vowels

vi) International phonetic Alphabet (IPA).

5. a) Do as directed in the brackets 10

i) The house was on fire (change the vioce)

ii) He was elected manager of the team
(change the vioce)

iii) Oil_____float if you pour it in water
(Use the correct form of 'Be' verbs)

iv) The match_____ started before I reached the field
(Use the correct form of the verb 'have')

v) If it rains tomorrow, we (stay) at home.
(Use the correct form of the verb in bracket)

vi) The captain with his team (be) going to the field.
(Use the correct form of the verb in bracket)

vii) When his temperature went up, a doctor was called.
(Use a phrasal verbs the word underlined)

viii) Akbar was the great king.
(change the sentence into negative without changing the meaning)

ix) I love to visit my relatives.
(Use a gerund in place of the underlined word)

x) Rama went to_____ hospital to see ailing friend.
(Fill in the blank with an article)

vi) The boy works hardly.

vii) No sooner he came the rain was start.

viii) The plane took up at 5 p.m.

ix) She is staying in this town for last ten years.

x0 The teacher said the earth moved round the sun.

□□

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Suppose you are working as a Company Secretary and you have been asked to make a report on a sudden mishap in the factory of the company. Your report containing details of what the company did for the affected labourers is to be published in newspaper. Draft a forwarding letter for the purpose.   20

OR

b) You have been asked to make a report on the decline of sale in a branch of the company where you are an acting supervisor. Your report will be placed before the Board of Directors. Draft a forwarding letter for the purpose.

2. a) Prepare a resume to be attached to your application for the post of a Sales Manager. 20

OR

b) Prepare a Curricular Vitae of yourself (a detailed documentation of your career and achievements); emphasizing the points that make you fit for a particular job.

3. a) Prepare an interview between youself and the interviewer for the post of Production Manager in a company. 20

OR

b) Suppose you are going to face an interview conducted by a board of interviewers for your promotion to a higher post in the same company. Draft the interview.

4. a) Draft a Tender Notice to be advertised in news papers for the purchase of 50 steel racks and other accessories for opening a new hall of an old library. 20

OR

b) Prepare a purchase order to be placed with a branded firm for supply of 40 ceiling fans and 40 pedestal fans for a new office building.

5. a) Explain why you prefer e-commerce to traditional commerce. 10

OR

b) Do you think that e-commerce is more transparent than traditional commerce?

6. Rewrite the folowing sentences, correcting error, if there is any: 1 × 10

i) Nabin as well as his sister are available.

ii) He is a MLA.

iii) I am distrusting that man.

iv) It is raining since 8'o'clock in the morning.

v) When I entered the hall, the function already started.

Group-B

2. Describe petrography of Conglomerate and Breccia. 9

3. Describe textures of sedimentary rocks. 9

4. Give an account of different structures of sedimentary rocks. Add a note on their significance. 9

5. What is the significance of heavy minerals in sedimentary petrology ? Write a note on "Sedimentary Provenance'. 9

6. Give an account of different sedimentary environment. 9

7. Describe different sedimentary basins of India. 9

8. Describe Petrography of Sandstone and Limestone. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No.1 which is compulsory

Group-A

1. Answer any *four* of the following : 6 × 4

   a) What does fabric in sedimentary rock mean ? What is its significance ?

   b) Give a brief account of process of formation of sedimentary rcoks ?

   c) Describe elements of hydraulics.

   d) Write a note 'Tectonics and sedimentation'.

   e) Write a brief note on 'Basin Analysis'.

   f) describe petrography of shale.

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Group-A

1. How does Conrad depict native African in *Heart of Darkness*? 7½

OR

What does Kurtz convey through his last words : "The horror ! The horror !" ?

2. Why does Mrs. Morel disapprove of Paul's relationship with Miriam ? 7½

OR

How does Paul react to his mother's death ?

3. What is the significance of Clarissa's party in *Mrs. Dalloway*? 7½

OR

[2]

Show your acquaintance with the Stream of Consciousness technique.

4. Annotate. 7½

Shall I part my hair behind ? Do I dare to eat a peach ?

I shall wear white flannel trousers, and walk upon the beach

I have heard the mermaids singing, each to each.

OR

Turning and turning in the widening gyre

The falcon cannot hear the falconer ;

Things fall apart : the centre canot hold ;

Mere anarchy is loosed upon the world,

Group-B

5. Justify the title of the novel, *Heart of Darkness*. 12½

OR

Attempt a character portrayal of Marlow.

[3]

6. Comment on Lawrence's treatment of Oedipus complex as reflected in Sons and Lovers. 12½

OR

Give your impression of Paul Morel.

7. Discuss Virginia Woolf's narrative technique in Mrs. Dalloway. 12½

OR

Comment on the Women's Movement in the early 20th Century.

8. Critically appreciate the poem "Leda and the Swan". 12½

OR

Is "The Love Song of J Alfred Prufrock" a love poem ? Give a reasoned answer.

Group-B

2. Discuss the Psychological law of Consumption. What are its implications ? 12½

3. Examine the permanent income hypothesis. How does it explain household consumption behaviour in the short run and long run ? 12½

4. Distinguish between autonomous investment and induced investment. Analyse the factors that determine induced investment. 12½

5. Define marginal effeciency of capital. Show how it helps in deciding the volume of investment. 12½

6. What is money multiplier ? Analyse its role in the determination of money supply in the economy. 12½

7. Derive the aggregate demand curve using IS-LM model. What causes aggregate demamd curve to shift ? 12½

8. Illustrate the trade-off between unemployment and inflation with the help of Phillips curve. Examine its policy implications. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write short notes on any *four* of the following : 7½×4

   a) Hawtrey's monetry theory

   b) Keynes views on trade cycles

   c) MEC

   d) Accelerator and MEI

   e) Liquidity Trap

   f) Phillips Curve

   g) Trade cycles–Phases

   h) Nature and shape of IS and LM curves.

[2]

Group-B

2. Discuss the dimensional of Public Administration in modern era. 12½

3. Examine the distinction between Public and Private Administration. 12½

4. Discuss the merits and demerits of Scientific Management of Theory 12½

5. Discuss Luther Gullick's view of Administrative Management. 12½

6. Examine E.Mayo's views of personal relations with its employees. 12½

7. Examine the Rigg's view in ecological approach of Public Administration. 12½

8. Discuss the features of corporation and its necessities. 12½

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2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write notes on any *four* of the following : 7½ × 4

   a) Define Public Administration and discuss its nature.

   b) Examine F.W. Taylor's theory of scientific management.

   c) Discuss the principles of good supervision.

   d) What is the ecological apporach of Public Administration ?

   e) Define corporation and give examples from Indian context.

   f) What is Public Policy ? How it is formed ?

   g) Examine the procedure of public policy formulation.

   h) Discuss the role of Bureaucracy in policy formulation.

Group-B

2. Give an account of the rise and growth of capitalism in modern west. 12½

3. Discuss the motive of Voyages and geographical explorations during early colonial expansion. 12½

4. Explain the conquest and colonization of the Americas. 12½

5. Analyse the development of art, architecture, literature and science during the Renaisssance. 12½

6. Describe the salient features of the spread of humanism in Europe. 12½

7. Make an estimate of the origin, course and results of the Reformation movement in England. 12½

8. Write an essay on the spread of reformation movements in Germany. 12½

9. Enuramate the nature and significance of the Commercial Revolution. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write notes on any *four* of the following : 7½ × 4

   a) Investiture.

   b) Knight.

   c) Discovery of America by Columbus.

   d) African Slaves.

   e) City States of Italy.

   f) Leonardo-de-Vinci.

   g) Martin Luther

   h) Mercantalism.

Group-B

2. Give an account of Pluralism. 12½

OR

Explain and examine the Realism.

3. What is knowledge ? Explain briefly. 12½

OR

Explain critically Empircism as a theory regarding the source of knowledge.

4. Distinguish between Fact and Value. Explain the pragmatic theory of value. 12½

OR

Explain and examine the Psychological Theory of Beauty. 12½

5. Give an account of the problem of substance. 12½

OR

Elucidate Plato's Theory of Universal.

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 7½ × 4

a) Define Philosophy and state its function.

b) What is Monisim?

c) Write short notes on Dualism.

d) Explain the criticism as the method of obtaining the knowledge.

e) State the nature of value.

f) Explain the objective conditions of Beauty.

g) What is the problem of Substance ?

h) Explain the nature of Causality.

Group-B

2. Define gender. Discuss the differences between sex and gender. 12½

3. What is gender Socialisation ? What are its agencies ? 12½

4. Explain the origin and growth of feminist theories. 12½

5. Critically examine the theories of radical feminism. 12½

6. What do you mean by women empowerment ? What are its dimensions ? 12½

7. Analyse the status of women in ancient India. 12½

8. Examine the health related problems of women in India. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 7½ × 4

   a) Define gender.

   b) Define gender socialization.

   c) What is feminism ?

   d) Define women empowerment.

   e) Discuss briefly any three dimensions of women empowerment.

   f) Discuss the status of women in pre-independent India.

   g) Write a brief note on Right to Education.

   h) Discuss the problem of sanitation in rural India.

Group-B

2. Define Ecology and discuss acclamatization to different environmental conditions.   9

3. Write an essay on methods of studying human ecology.   9

4. What do you understand by ecological stresses ? Explain human body is adopted to high altitude. 9

5. Descibe the cultural adaptation in a hunting and food gathering society.   9

6) Explain the culturaladaptation in an Agriculturaland peasant society.   9

7. Describe ecological theme of state formation in relation to molithic revolution.   9

8. Discuss the impact of urbanization and industrialization on man.   9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write short notes on any *four* of the following : 6×4

    a) Ecology

    b) Biotic Component

    c) Acclamatization

    d) Ecological stresses

    e) Pastoralism

    f) Shifting cultivation

    g) Ecological Themes

    h) Hydraulic civilization.

8. Define χ^2 statistic and describe in detail its applications as regard to test of goodness of fit and indepenent of attributes. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 4 × 6

    a) Show that for n attributes $A_1, A_2, A_3......A_n$ $(A_1 A_2 A_3....A_n) \geq (A_1) + (A_2) + ...+(A_n) - (n-1)N$ where N is the total numbers of observations.

    b) In a series of houses actually invabled by smallpox; 70% is the inhabitants are attacked by 85% have been vaccinated. What is the lowest percentage of the vaccinated that must have been attached ?

    c) Explain the difference between population and sample with the help of a physical example.

    d) Differentiate between parameter and statistic.

e) Write a short note on 't' distribution and point out its uses.

f) Two random samples gave the following results.

Sample	size	Sum of observations	Sum of Squares of the deviation from mean
I	10	150	90
II	12	168	108

Test whether the samples come from the same normal population.

g) Differentiate between small sample test and large sample test.

h) Give conditions for independence of attributes A, B and C.

Group-B

2. For a trivariate data with variables X_1, X_2 and X_3, derive the equation of the plane of regression of X_1 on X_2 and X_3. 9

3. Explain the concept of multiple and partial correlation coefficients. Show that in usual notations

$$R^2_{1.23} = \frac{r^2_{12} + r^2_{13} - 2r_{12}\ r_{23}\ r_{13}}{1 - r^2_{23}} \le r^2_{12} .$$

9

4. Define Yule's coefficient of association Y and coefficient of colligation Q and establish the relationship $Q = \dfrac{2y}{1+y^2}$ 9

5. Define sampling distribution and standard error. Obtain the standard error of sample variance. 9

6. Explain the meaning of tests of significance based on large samples. Carry out the test of significance for difference of two sample means where samples are taken from two different populations. 9

7. A random sample of 100 articles selected from a batch of 2000 articles shows that the average diameter of the article is 0.354 cm with a standard deviation 0.048 cm. Find 95% confidence interval for the average of this batch of 2000 articles. 9

Group-B

2. What are the aims and objectives of teaching History at school level? 9

3. Describe the chronological approach to organisation of contents in History curriculum. 9

4. Discuss about the school history cuuriculum of Odisha. 9

5. Explain narration-cum-discussion method of teaching History with example. 9

6. Discuss the different types of teaching-learning materials used in teaching history. 9

7. Prepare a Lesson plan on any topic of your choice from class VI History text book of Odisha Herbartian approach. 9

8. Draw a relationship of history with other school subjects like Geography and Mathematics. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer questions selecting any *one* section as per instruction given therein

SECTION-A
(Odia Method)

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 6 × 4

    a) What is the importance of Mother tongue in the life of a child ?

    b) Discuss the place of mother-tongue in the school curriculum.

    c) Explain direct method of teaching mother tongue Odia.

    d) Explain the method appropriate to teach Odia Grammar.

e) Write the purpose of using Teaching-learning materials in teaching Mother tongue.

f) What is the application of Language Laboratory in Odia ?

g) Explain Herbartian approach to preparation of Lesson Plan in Odia.

Group-B

2. Discuss the aims and obectives of teaching Odia at school level. 9

3. Explain discussion-cum-appreciation method for teaching Odia in a Class. 9

4. Explain the technique of teaching an Odia composition in a class. 9

5. Discuss the importance and purpose of language text book. 9

6. Write the different types teaching-learning materials used for teaching Odia language. 9

7. Discuss how Lesson Plan in Odia prose will be prepared. 9

8. Explain 5 E model of preparation of a Lesson plan in Odia. 9

SECTION-B
(History Method)

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 6 × 4

a) What is the importance of teaching History in schools ?

b) Explain the relationship of History with Mother tounge with example.

c) Explain the local perspectives for selection of content of History.

d) State how will you develop sense of time and space in history.

e) Explain the procedure of drawing Time line in History teaching.

f) Explain the ITC-enabled teaching aids in History.

g) Write about ICON Design Model of preparation of Lesson Plan in History.

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1

which is compulsory

Group-A

1. Answer any *four* of the following : 4 × 6

   a) Define Social Psychology and discuss its nature and scope.

   b) Write notes on any *three* of the following :

   i) Questionnaire method of Social Psychology

   ii) Self Concept

   iii) Self Esteem

   iv) Self Expression.

   c) What is Attitude ? With suitable examples explain how attitudes are formed.

   d) Distinguish between Prejudice and Discrimination. Suggest the ways and means of reducing social prejudices.

e) What is meant by a Group? Describe the various functions of a group.

f) Who is a Leader? Evaluate the Trait, Situational and Contigency approaches to leadership.

g) What do you mean by Prosocial Behaviour? Citing relevant examples discuss the various determinants of prosocial behaviour.

h) Explain any *two* of the following :

   i) Situational and Social Learning Theory of Aggresion.

   ii) Determinants of Aggression

   iii) Prevention and control of aggression.

Group-B

2. Briefly discuss different methods used in Social Psychology. 9

3. How can we perceive others and form impressions. 9

4. Discuss different methods for the measurement of attitudes. 9

5. Briefly describe the nature and components of prejudice. 9

6. Discuss different types of leadership with examples. 9

7. Enumerate different theoretical explanations of prosocial behaviour with illustrations. 9

8. Discuss different theoretical perspectives of aggression. 9

V-173-0.5 ▢▢

v) Repair charges 50% of depreciation

vi) Power of 10 units hour @ ₹5/- per unit

vii) Lubricating oil @ ₹20 per day of 8 hours

viii) Consumable stores @ ₹100 per day of 8 hours

ix) Wages of operator @ ₹80 prday.

4. Distinguish between job costing and contract costing. Explain with illustrations the different methods of caculating profits of incomplete contracts.   6+14

<div align="center">OR</div>

A product passess through three processes A, B and C. The details were as follows ::

	Process A (₹)	Process B (₹)	Process C (₹)
Sundray materials	1,000	1,500	500
Labour	5,000	8,000	6,500
Direct expenses	1,050	1,188	2,009
Actual output (in units)	9,500	9,100	8,100
Wastage	3%	5%	8%
Sales of wastage (per unit)	.25p	.50p	Re 1

10,000 units were issued to process A in the beginning at a cost of Re.1 per unit. Prepare the

---

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is Cost Accounting ? State briefly the scope of Cost Accounting.   4 + 6

    b) Write short notes on the following :   2½ × 4

       i) Cost Unit

       ii) Fixed Cost

       iii) Variable Cost

       iv) Prime Cost.

<div align="center">OR</div>

The stock of material 'P' as on 1st May 2014 is 500 units of Re 1 per unit. Following purchases and issues of this item were made during the month of May, 2014 :

Date	Quantity purchased (units)	Rate per unit (₹)	Quantity issued (units)
May 5	---	---	200
May 11	400	1.10	---
May 16	300	1.20	---
May 21	---	---	500
May 22	---	---	300
May 25	600	1.30	---
May 26	---	---	300
May 31	---	---	200

Prepare a Stores Ledger Account showing how the value of the above issues should be arrived under the Base stock method when it operates in conjuction with LIFO Base Stock is 200 units. 20

2. What do you mean by labour turnover ? How is it measured ? Why is high labour turnover a matter of serious concern to the management ? 4+6+10

OR

a) Describe the characteristics of an ideal incentive scheme of wage payment. 8

b) The following particulars apply to a job.
   Standard Time   10 hours
   Time taken   8 hours
   Time Rate   ₹20 per hour
   Calculate earnings under Rowan system. 12

3. What are the various methods of absorption of factory overhead ? Which method do you consider most scientific and why ? 12 + 8

OR

From the following information calculate machine hour rate for the following machine. 20

i) Cost of machine ₹90,000

ii) Installation charges ₹10,000

iii) Working life 10 years

iv) Working hours 2,000 per year

Process Accounts, assuming there are no opening or closing stock. Also give the abnormal wastage and Abnormal gain A/cs.   20

5. What is Integrated Accounting System? State its advantages and pre-requisites.   3 + 10 + 7

OR

The profit of a firm as per Cost Accounts is ₹1,50,000. The following details are ascertained on comparison of Cost and Financial Accounts :

	Cost Accounts (₹)	Financial Accounts (₹)
a) Opening stock :		
Materials	10,000	15,000
Finished goods	18,000	16,000
b) Cloosing stocks :		
Materials	12,000	13,000
Finished goods	20,000	17,000

c) Interest charged but not paid ₹10,000

d) Write off preliminary expenses ₹500

e) Write off good will   ₹2,000

f) Indirect expenses charged in financial accounts ₹80,000 but ₹75,000 recorded in Cost Accounts.

Find out the financial profit by preparing a reconciliation statement.   20

[2]

b) Write notes on : 5 × 4

i) Price Discrimination

ii) Reasons initiating Price Cuts

iii) RIO Pricing Strategy.

iv) Skimming Pricing.

4. a) Discuss the services which wholesalers render to the manufacturers and the customers. Can these middleman be eliminated ? 7 + 7 + 6

OR

b) Discuss the various physical distribution decision areas. 20

5. a) "Personal selling process is the logical sequence of steps that a sales person takes in dealing with prospective customer". Discuss this statement and discuss the various stages in the personal selling process. 10 + 10

OR

b) Discuss the various media used for advertising the product/service with the comparative analysis. 20

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you understand by marketing ? Differentiate between the traditional and modern concept of merketing. 8 + 12

OR

b) Explain the concept of marketing mix and describe various factors that determine it. 8+12

2. a) What do you understand by consumer behaviour ? Discuss the various theories relating to consumer behaviour. 6 + 14

Or

b) Discuss various market segmentation strategies (Pattern of segmentation) with their relative characteristics. 20

3. a) What do you understand by Product Planning ? Discuss briefly the problems of introducing a new product. 8 + 12

Or

b) Explain the agricultural location theory of Von Thunen.

4. a) Explain the industrial location theory as propounded by Weber.

OR

b) Bring out the major industrial regions of Asia.

5. a) Discuss the role of water transport in the international trade.

OR

b) "Transport plays a key role in the economic development of a country". Justify.

□□

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

Give maps and diagrams wherever necessary.

1. a) Discuss the meaning, concept and scope of economic geography.

OR

b) Elaborate upon the types of economic activities and their world distribution.

2. a) Discuss the various factors that influence agricultural systems in the World.

OR

b) Account for the factors affecting the location of an industry.

3. a) Give an account of the production and distribution of wheat in the World.

OR

[4]

c) Show that the necessary and sufficient condition for the vector valued function $\vec{V}(t)$ to have constant direction is $\vec{V} + \dfrac{d\vec{V}}{dt} = 0$ 6

d) Show that $\nabla \cdot (\vec{F} \times \vec{g}) = \vec{g} \cdot \text{curl}\ \vec{F} - \vec{F} \cdot \text{curl}\ \vec{g}$ 6

V-293-0.5   □□

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *three* of the following :   4 × 3

i) Find the value of $\displaystyle\int_0^{\pi/2} \sin^8 x\ dx$

ii) Find the curve $y = \log x$ is concave or convex upward.

iii) Find the asymptote parallel to the coordinate axes for the curve $\dfrac{a^2}{x^2} + \dfrac{b^2}{y^2} = 1$

iv) Determine the nature of origin of the curve $y^2(a - x) = x^3$.

v) Find the point of inflection of the curve $x = 3y^4 + 4y^2 + 5$

V-293   [Turn Over

2. a) Find the asymptotes of the curve $x^3 + y^3 = 3axy$.   6

   b) Find the nth derivative of the curve $y = x^n e^x$ 6

OR

   c) Show that $y = e^x$ is concave upward.   6

   d) Find the nth derivative of $\dfrac{1}{x^2 + x + 1}$ 6

3. a) Trace the curve $y^2(a^2 - x^2) = a^2 x$.   6

   b) Obtain the reduction formula for $\displaystyle\int x^n e^{-x}\, dx$ 6

OR

   c) Trace the curve.   6

     $x = a(Q + \sin\theta),\ y = a(1 + \cos Q)$.

   d) Determine $\displaystyle\lim_{x \to 0} (\cos x)^{1/x^2}$ 6

4. a) Find the perimeter of the curve   6

     $r = a(1 + \cos Q)$ 6

   b) Find the volume of the solid formed due to rotation of the ellipse

     $\dfrac{x^2}{4} + \dfrac{y^2}{3} = 1$ about axis of x.   6

OR

   c) Find the area bounded by the curve .

     $x^{2/3} + y^{2/3} = a^{2/3}$ 6

   d) Find the surface of the solid generated by the revolution of the curve

     $x = a \cos^3 t,\ y = a \sin^3 t$.   6

5. a) Find the equation of the sphere which passes through the points $(1, 1, 2)$, $(1, 0, 1)$ and whose centre lies on the straight line.

     $x + y + z - 4 = 0 = x - y + z + 2$ 6

   b) Find the equation of the cone whose vertex is $(1, 1, 2)$ and whose guiding curve in the ellipse

     $\dfrac{x^2}{16} + \dfrac{y^2}{9} = 1,\ z = 0$.   6

OR

4. a) Discuss the administration and religion of Harshavardhana.

OR

b) Evaluate the achievments of sultan Ghiyasuddin Balban.

5. a) Give an account of the reforms of sultan Alauddin Khiliji.

OR

b) Discuss the causes of the decline of the Delhi Sultanate.

V-350-0.2   □□

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Discuss the general features of the Harappan civilization.

OR

b) Give an account of the early Vedic Culture.

2. a) Discuss the main principles of Jainism.

OR

b) Examine the conquest and administration of Chandragupta Maurya.

3. a) Review the conquest of Samudragupta

OR

b) Assess the cultural development of the Gupta age.

V-350   [Turn Over

[4]

Put the following Boolean expressions into normal form.   8 + 12

a)   AB + A'C + C'

b)   (AB + A'C)' + B.

□□

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a)   What is 'Figure' and what is 'Mood' in a Syllogism ? Determine vadid moods in 2nd Figure.   2 + 2+16

OR

b)   Prove that :

i)   If one of the premise be negative, the conclusion must be negative.   10

ii) From a particaular major premise and a negative minor premise, no conclusion fallows.   10

2. a)   What, according to C.Lewis, are the characteristics of Symbolic Logic ?   10

b) Distinguish between Inference and Implication. 10

OR

c) Explain with examples the following truth functions :

i) The Implicative Function. 10

ii) The alternative Function. 10

3. Construct truth-table for the following propositional formula and say which of them are tautologies. 6 + 6 + 8

i) $(p \supset q) \supset (\sim q \supset \sim p)$

ii) $(p \cdot q) \supset (p \lor q)$

iii) $((p \supset q) \supset r) \supset (p \supset (q \supset r))$

OR

How are proposition classified according to their matrix numbers ? Explain. 20

4. Reduce the following formulae into CNF and say which of them are tautologies. 8 + 12

i) $((p \supset q) \cdot \sim q) \supset \sim p$

ii) $((p \supset q) \cdot (q \supset r)) \supset (p \supset r)$

OR

Test the validity of the following arguments by the method of equivalent substitution. 10

a) i) $(A \lor B) \supset C$

ii) $\sim C$
Therefore, $\sim B$

b) i) $\sim p \supset q$ 10

ii) $q \supset R$

iii) $\sim R$
Therefore, p

5. Translate the following propositions by appropriate quantifiers. 5 × 4

a) All men are mortal.

b) No crows are cows.

c) Some politicians are liars.

d) Some men are not honest.

OR

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions from both sections

Section-A

1. a) Discuss the political, social and cultural background of the Jacobean Age.   7½

   OR

   b) Bring out Chaucer's realism in the portrayal of the Wife of Bath.

2. a) Describe the characteristics of true love in the light of Shakespeare's 'Sonnet No.116'.   7½

   OR

   b) Critically analyse Ben Jonson's love poem 'Song to Celia'.

[Turn Over

3. a) Discuss the role of the three Witches in *Macbeth*. 7½

OR

b) Sketch the character of Banquo.

4. a) Write a note on wit and humour in *Twelfth Night*. 7½

OR

b) Sketch the character of Lady Olivia.

Section-B

5. a) Discuss the historical, political, social and cultural factors which gave birth to the English Renaissance. 12½

OR

b) Discuss the Chaucer's art of characterisation with special reference to the Wife of Bath.

6. a) "Throughout *Macbeth*, we watch the deterioration of a great man ; but we never lose the sense of his greatness". Discuss. 12½

OR

b) Sketch the character of Lady Macbeth.

7. a) Discuss the elements of the romantic comedy in *Twelfth Night*. 12½

OR

b) Sketch the character of Viola.

8. a) Write a critical appreciation of Shakespear's Sonnet no 73', commenting on the imagery used in it. 12½

OR

b) Critically appreciate Spenser's 'Sonnet no. 75' and point out the differences between Shakespearean Sonnet and Spenserian Sonnet.

Group-B

2. Discuss the basic economic problems faced by any economy. 12½

3. State and explain Law of Demand and point out its limitations. 12½

4. Explain the modern theory of incidence of taxation. 12½

5. Explain methods of measurement of Elasticity of Demand. 12½

6. State and explain first order necessary and second order sufficient condition for the attainment of consumer's equilibrium under Indifference Curve technique. 12½

7. 'Law of Increasing Return is an empirical fact whereas law of Diminishing Return is the logical necessity'. 12½

8. Explain the Mariginal Productivity theory of distribution. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write short notes on any *four* of the following: 7½×4

   a) Economicis one Normative science.

   b) Problem of Scarcity and Choice

   c) Production Possibility Frontier

   d) Concave and Convex Curves

   e) Effect of simultaneous change in Demand and Supply on Equilibrium price

   f) Application of Minimum Price Legislation.

   g) Arc Elasticity of Demand

   h) Giffen's Paradox.

g) Discuss the differences between the Procedural and Substantive Democracy.

h) How the minorities can be best represented in a democratic form of Government ?

Group-B

2. Discuss the general characteristics of Politics. 12½

3. Analyse the Maxian view of Political Theory 12½

4. Examine the Historical approach to the study of Political Theory. 12½

5. Make a critical evaluation of the Conservative Political Theory. 12½

6. Examine the nature of Socialist Feminism. 12½

7. Discuss the merits and demerits of different types of electoral system. 12½

8. Write a note on Substantive Democracy. 12½

□□

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer on any *four* of the following : 7½×4

   a) Discuss the significance of Political Theory.

   b) Describe the important characteristics of liberal view of Political Theory.

   c) Enumerate the nature of Normative approach to the study of Political Theory.

   d) Write shortly the Anarchist views on the State.

   e) Point out the causes for the rise of the Second Wave of Feminism.

   f) Write down the basic differences between the Modern and Post-modern Political Theory.

Group-B

2. Throw light on the Literary and archaeological sources for the study of Ancient Indian History. 12½

3. Write a note on the sequence and technological developments of the Polaeolithic Culture. 12½

4. Discuss the chronological distribution and new technology of the Mesolithic Culture. 12½

5. Highlight the chronological distribution of the Neolithic Culture. 12½

6. Give an account of the subsistence pattern of the Chalcolithic culture. 12½

7. Discuss the origin, town planning and agrarian base of the Harappan Civilization. 12½

8. Examine the social, political and religious life of the Later Vedic culture. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No 1 which is compulsory

Group-A

1. Write short notes on any *four* of the following: 7½×4

   a) Rajatarangini

   b) Indica

   c) Punchmarked Coins

   d) Tools of the Palaeolithic Age

   e) Microlith

   f) Neolithic sites of North India

   g) Great Bath

   h) Rig Vedic religion.

Group-B

2. Discuss the various meaning of the word "meaning". 12½

3. Distinguish between the defining and accompanying characteristics. 12½

4. Can definition be true or false ? Discuss. 12½

5. Explain use view of meaning. 12½

6. Distinguish between analytic and synthetic proposition. 12½

7. What is a proposition ? How is it different from a sentence. 12½

8. Explain the nature and charateristics of inductive reasoning. 12½

□□

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write short notes on any *four* of the following : 7½×4

   a) Vagueness

   b) Nature and definition

   c) Persuasive and definition

   d) Referential theory of meaning

   e) Emotive use of language

   f) Category mistake

   g) Law of Identity

   h) Deductive reasoning.

9. a) Prove that the equation

$4x^2 - y^2 + 2z^2 + 2xy - 3yz + 12x - 11y + 6z + 4 = 0$

represents a cone. Find its vertex.

OR

b) Find the equation of the enveloping cylinder of the sphere $x^2 + y^2 + z^2 = 4$ and where generators

are parallel to the line $\dfrac{x}{1} = \dfrac{y}{-1} = \dfrac{z}{1}$

10. a) find the equations of the tangent planes to the

conicoid $\dfrac{-x^2}{3} + \dfrac{y^2}{7} + \dfrac{2z}{21} = 1$ which passes

through the line $7x - 6y + 9 = 0 = z - 3$.

OR

b) Find the equations of the generators of the hyperboloid of one sheet

$\dfrac{x^2}{1} + \dfrac{y^2}{4} - \dfrac{z^2}{9} = 1$ through the point $(1, 2, 3)$.

□□

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

Symbols used have their usual meaning

1. a) Show that for the curve

$$\frac{x + \sqrt{a^2 + y^2}}{a} = \log \frac{a + \sqrt{a^2 - y^2}}{y}$$

$y\dfrac{ds}{dy}$ is constant

OR

b) Find the radius of curvature for the curve

$x = a(t + \sin t), y = a(1 - \cos t)$.

2. a) Trace the curve $y^2 x^2 = x^2 - a^2$.

OR

b) Find the length of the arc of the catenary

$y = c \cosh^{x/c}$ measured from the vertex (o, c) to any point (x, y).

[Turn Over

3. a) Find the area of the loop of the curve $x^3 + y^3 = 3axy$.

OR

b) Find the area of ellipse $x^2/a^2 + y^2/b^2 = 1$

4. a) Find the volume of the solid generated by revolving the curve $x^{2/3} + y^{2/3} = a^{2/3}$ about x-axis.

OR

b) Find the surface of the sphere of radius a.

5. a) Solve $(2x+y+3)\dfrac{dy}{dx} = x+2y+3$.

OR

b) Solve $(px - y)^2 = (1 + p^2)(x^2 - y^2)$.

6. a) Solve $(1 - x^2)\dfrac{dy}{dx} - xy - axy^2 = 0$

OR

b) Find orthogonal trajetories of the family.

i) $\dfrac{x^2}{a^2} + \dfrac{y^2}{a^2 + \lambda} = 1$

ii) $r = 2a \cos \theta$

7. a) Solve $\dfrac{d^2y}{dx^2} - 2\dfrac{dy}{dx} + 4y = e^x \cos x$

OR

b) Find the general solution of

$x^2 y'' + 2x(1 - x) y' + x(x - 2) y = 0.$

8. a) Find the laplace transform of

i) $\sin^2 2t$

ii) $e^{-2t} \cos t$

OR

b) Solve using laplace transform

$y'' - 4y' + 4y = 0, \quad y(0) = 0, \quad y'(0) = 3.$

Group-B

2. Describe the functions of Educations towards society. 9

3. Discuss the aim of education for individual development. 9

4. Describe educational implications of Meta-physics. 9

5. Narrate the educational implications of Vedanta Philosophy. 9

6. What is Pragrmatism and what are its educational implications ? 9

7. Describe the influence of Gandhiji on the aims and curriculum of Indian Education. 9

8. Write the influence of John Dewey on the practice of Education. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer on any *four* of the following : 6 × 4

   a) Explain the nature of Education.

   b) What is meant by Education for social efficiency ?

   c) Define philosophy and Education each.

   d) What is Epistemology ?

   e) What is Sankhya Philosophy ?

   f) Explain then Naturalistic method of teaching

   g) What is the Integral Education ?

f) What are the major areas found in cerebral cortex ? What functions do they serve ?

g) Briefly point out everyday changes in conciousness.

h) What do you mean by extended states of consciousness ? Examine hallucinations as extended state of consciousness.

Group-B

(Each answer should be within 250 words)

2. Discuss psychology as a scientific discipline. 9

3. Briefly explain the cognitive, Humanistic and Sociocultural perspective of psychology. 9

4. Discuss the merits and limitations of survey method and case study with suitable examples. 9

5. Discuss the nature, advantages and limitations of correlational methods. 9

6. With a suitable diagram, discuss the structure and functions of a neuron. 9

7. Briefly discuss the structure and functions of Autonomic Nervous System. 9

8. Examine and explain hypnosis and meditation as extended states of consciousness. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1
which is compulsory

Group-A

1. Answer on any *four* of the following within 150 words: 6 × 4

a) Define Psychology. Discuss psychology as the science of behaviour, experience and mental process.

b) Briefly discuss the behavioural and psychodynamic perspective in Psychology.

c) Discuss the merits and limitations of different types of observations.

d) Briefly discuss the utility and steps involved in the Experimental method.

e) Discuss different functions of endocrine system. How these glands affect human behaviours and personality ?

b) Explain the importance of web-browsers. 3

c) Explain the various search engines used in internet. 6

OR

d) Explain various steps to send an e-mail with different attachments. 6

e) Internet has reduced the radius of earth. Comment. 6

□□

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) A box contains 5 red and 2 white balls. In how many ways can 6 balls be selected so that there are at least two balls of each colour ? 6

   b) How many triangles can be made whose vertices are at the vertices of an octagon but none of whose sides happens to come from the sides of the octagon ? 6

   OR

   c) Find the coefficients of x^2 and x^{-17} in the expansion of $\left(x^4 - \dfrac{1}{x^3} \right)^{15}$ 6

   d) Evaluate $\displaystyle\sum_{n=1}^{\infty} \dfrac{n^2}{(n+1)!}$ 6

[Turn Over

2. a) If A is a non-singular square matrix then prove that $\text{adj}(\text{adj } A) = |A|^{n-2} A$ where n is order of A.　　6

   b) If A is a singular matrix then prove that

   $$\left|A^{-1}\right| = |A|^{-1}$$　　6

   OR

   c) Using elementary transformation find the inverse of the matrix

   $$A = \begin{bmatrix} 2 & 1 & 0 \\ 3 & -2 & -1 \\ 3 & 0 & -5 \end{bmatrix}$$　　12

3. a) Find the rank of the matrix　　12

   $$A = \begin{bmatrix} -2 & -4 & -1 & 1 \\ 3 & -2 & 1 & 3 \\ 0 & -7 & 3 & 6 \\ -1 & -1 & 3 & 2 \end{bmatrix}$$

   OR

   b) Show that the homogeneous system of equations

   $$x - 2y + z = 0$$
   $$x + y - z = 0$$
   $$3x + 6y - 5z = 0$$

   has non-trivial solution and hence find the solution.　　12

4. a) Explain storge systems of a computer.　　6

   b) Differentiate between :
   i) Input devices and output devices.　　3
   ii) Primary memory and secondary memory.　　3

   OR

   c) Write short notes on :　　4 × 3
   i) Processing unit
   ii) display devices
   iii) Operating system of a desktop.

5. a) Note down the steps to print an MS-Power point document.　　3

g)   Write a note on Formal social control

h)   Write a note on Assimilation.

Group-B

2.   Discuss the Emergence of Sociology.   12½

3.   Discuss the importance of Norms and values in society.   12½

4.   Critically examine C.H. Cooley's looking glass self theory.   12½

5.   Critically examine Functionalist theories of social stratification.   12½

6.   Define social mobility and discuss its importance.   12½

7.   Define Social Control and discuss different types of informal social control.   12½

8.   Define Co-operation and differentiate between co-operation and conflict with examples.   12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1
which is compulsory

Group-A

1.   Write short notes on any *four* of the following: 7½×4

a)   Discuss the relationship between Sociology and Anthropology.

b)   Differentiate between Society and Community.

c)   Describe the charcteristics of culture.

d)   Discuss briefly the relationship between Individual and society.

e)   Discuss the importance of primary group in society.

f)   Discuss briefly the determinants of Social Mobility.

[4]

b) State the poslutates of special theory of relativity. Using these postulates derive Loretz transformation equations.   2 + 13

c) Calculate the speed of electron that double its rest mass.   5

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. a) State and prove Gauss divergence theorem. 12

b) Prove that divergence of curve of a vector is zero.   4

c) Show that div

$$\left(\vec{A} \times \vec{B}\right) = \vec{B} \ \text{curl} \ \vec{A} - \vec{A} \ \text{curl} \ \vec{B}$$ 4

OR

d) Define central force and state its characteristics.   3 + 3

e) Reduce the two body system to a single body system and obtain an expression for reduced mass.   14

2. a) Define gravitational potential. Derive the expression for potential at a point outside and inside a solid sphere and hence deduce the field. $2 + 7 + 7 + 4$

OR

b) What is damped vibration. Obtain a general expression for displacement of a particle executing damped vibration and solve it for the motion to be overdamped, critically damped and oscillatory. $2 + 3 + 15$

3. a) Describe Carnot's cycle and derive an expression for the efficiency in terms of two temperatures between which it operates.

A Carton engine having sink temperature 7^0C has an efficiency 40%. Calculate the temperature be increased to change the efficiency to 50%. $6 + 8 + 6$

OR

b) Derive the Maxwell's thermodynamical relations. 12

c) Derive Clausius-Claypeyron equation. What is the effect of pressure on boiling point and melting point. $5 + 3$

4. a) What is an eye--piece and what is its advantage over a single lens. 5

b) Describe the construction and theory of Huygen's eye-piece and compare it with Ramsden eye-piece. $10 + 5$

OR

c) Explain the formation of Newton's ring with the help of neat diagram and derive the expression for the diameter of rings. How the wave length of monochromotic light be determined by it. $15 + 5$

5. a) What do you mean by polarisation. Discuss the construction and uses of Nichol prism. $5 + 15$

OR

ii) HO – CH$_2$– CH$_2$– OH

iii) H$_2$NCO – CONH$_2$

iv) HOOC – CH(OH) – CH(OH) – COOH

e) Define and explain electrophiles and nucleophiles with examples of each.   3 + 3

d) Explain SN$_1$ and SN$_2$ reactions with example of each.   3 + 3

6. a) Write notes on the following :   5 × 4

   i) Chlorination of benzene

   ii) Reduction of nitrobenzene in neutral medium.

   iii) Inerrtness of arylhalogen towards nucleophilic substitution.

   iv) Preparation and uses of TNT.

OR

b) How does the nature of substituent affect the reactivity of aromatic ring system towards electrophilic sustitution reactions ? Explain on the basis of inductive and resonance effects ?   10

c) Give the detailed mechanism of electrophilic substitution reaction in benzene by taking nitration and sulphonation as examples.   10

□□

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Write the postulates of Kinetic molecular theory of gases.   5

   b) Derive an expression for the pressure exerted by the molecules of a gas on the basis of kinetic molecular theory of gases.   10

OR

   c) Write notes on Maxwell's distribution of molecular velocities.   9

   d) Explain Root mean square velocity, average velocity and most probable velocity.   2 × 3

2. a) Write notes on the following :

   i) Brownian movement   3

   ii) Hardy-Schulze rule   5

   iii) Electrophoresis   5

   iv) Gold number   2

OR

   b) Explain the terms phase, component and degree of freedom with example.   2½ × 3

c) Draw and explain phase diagram of water system. 7½

3. a) Write notes on the following :
   i) de Broglie equation 4
   ii) Pauli exclusion principle 4
   iii) Shape of 'd' orbitals 4
   iv) Hund's rule. 3

OR

b) What is ionisation energy ? How does it vary along a period and down a group ? 2 + 4

c) Explain the following : 2 × 3
   i) Second ionisation energy of an element is always greater than its first ionisation energy.
   ii) Electron affinity of 'F' is less than that of 'Cl'.
   iii) Electronegativity value of noble gases is almost equal to zero.

d) Between F^-, Ne and Na^+ which will have smallest size and why ? 3

4. a) What is lattice energy ? How can the lattice energy of NaCl be determined using Born-Haber cycle ? 2 + 5

b) Write the conditions for hybridisation. 2

c) Explain the shape of the following molecules basing on VSEPR theory. 6
   (i) NH_3 (ii) H_2O.

OR

d) Discuss the shapes of the following on the basis of hybridisation. 6
   i) CH_4 (ii) C_2H_4 (iii) C_2H_2.

e) Draw the molecular orbital diagram of N_2 molecule. Calculate its bond order and predict its magnetic character. 3 + 2

f) Explain :
   i) Oxygen molecule is paramagnetic 2
   ii) Half filled and fully filled orbitals are more stable. 2

5. a) What are Carbanions ? Discuss the formation, structure and stability of 1^0, 2^0 and 3^0 carbanions. 2 + 2 + 2 + 6

b) Explain with example : 5 + 3
   i) Hyperconjugation   (ii) Sterric effect.

OR

c) Explain :
   i) Chloroacetic acid is more acidic than acetic acid. 2
   ii) Methylamine is more basic than ammonia. 2

d) Give IUPAC names of the following : 4
   i) $OHC - CH_2 - CO - CH_3$

3. Discuss the mechanism of stomatal opening and closing in plants during transpiration.

Or

Write notes on the following :

a) Osmosis

b) Plasmolysis.

4. Give an account of TCA cycle.

Or

Write notes on the following :

a) Inhibitors

b) C_4 plants.

5. Discuss the causes, effects and control measures of Water pollution.

Or

Write notes on the following :

a) Tetrasporic embryosac

b) Ecological anatomy of stem of hydrophytes.

□□

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

Give labelled diagrams wherever necessary

1. Give an account of the structure and economic importance of Bacteria.

Or

Write notes on the following :

a) Transformation.

b) Economic importance of viruses.

2. Describe the structure and reproduction of *Anthoceros*.

Or

Write notes on the following :

a) Economic importance of fungi

b) Thallus structure of *vaucheria*.

[Turn Over

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Symbols used have their usual meaning.

1. a) Solve the following systems of linear equations by matrix inversion method : 7

   $x + y - 2z = 3$

   $3x + y - z = 8$

   $2x - y + z = 0$

   b) Find the rank of the matrix by using row-reduction method : 6

$$\begin{bmatrix} 1 & 2 & -1 & 0 \\ -1 & 3 & 0 & -4 \\ 2 & 1 & 3 & -2 \\ 1 & 1 & 1 & -1 \end{bmatrix}$$

OR

[Turn Over

c) Find the rank and nullity of the matrix.

$$\begin{bmatrix} 2 & 0 & 1 \\ 7 & 1 & 2 \\ 3 & -1 & 1 \end{bmatrix}$$ 7

d) Solve the following system of equations by using Cramer's rule :   6

$2x - 3y + z = 1$

$x + y - z = 0$

$x - 2y + z = -1$

2. a) Find the eigenvalues and eigenvectors of the matrix :   12

$$\begin{bmatrix} 1 & -1 & 2 \\ 0 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$$

OR

b) Reduce the matrix :   12

$A = \begin{bmatrix} 1 & 2 & -2 \\ 2 & 1 & 2 \\ -2 & 2 & 1 \end{bmatrix}$ to the diagonal form.

3. a) If $\vec{r} = \vec{a}\cos\lambda t + \vec{b}\sin\lambda t$, where $\vec{a}$, $\vec{b}$ are constant vectors, then show that.   7

i) $\dfrac{d^2 r}{dt^2} + \lambda^2 \vec{r} = 0$

ii) $\vec{r} \times \dfrac{d\vec{r}}{dt} = \lambda\left(\vec{a} \times \vec{b}\right)$

b) Find div (curl F), where

$F = x^2 y\hat{i} + xz\hat{j} + 2yz\hat{k}$ 6

OR

c) Verify that

$u = (6xy + z^3)\hat{i} + (3x^2 - z)\hat{j} + (3xz^2 - y)\hat{k}$

is irrotational.   7

d) If $u = (3x^2 y - z)\hat{i} + (xz^3 + y^4)\hat{j} - 2x^3 z^2 \hat{k}$

then find grad (div u) at $(2, -1, 0)$.   6

4. a) Evaluate $\int_c F.\,dr$ where $F = x^2 y^2 \hat{i} + y\hat{j}$ and the curve c is $y^2 = 4x$ in the xy-plane from $(0, 0)$ to $(4, 4)$.   6

   b) Evaluate

   $\int F.\,ndS$ where $F = z\hat{i} + x\hat{j} - 3y^2 z\hat{k}$ and S is the surface of the cylinder $x^2 + y^2 = 16$ included in the first-octant between $z = 0$ and $z = 5$.   6

   OR

   c) Apply Gauss' theorem, evaluate $\int_s F.ndS$

   where $F = x\hat{i} - y\hat{j} + (z^2 - 1)\hat{k}$ and S is the cylinder formed by the surfaces $z = 0$, $z = 1$, $x^2 + y^2 = 4$.   6

   d) Verify Stokes' theorem for the function

   $F = x^2 \hat{i} + xy\hat{j}$, integrated round the square in the plane $z = 0$, whose sides are along the lines $x = 0$, $y = 0$, $x = a$, $y = a$.   6

5. a) i) If G is a group, then the identity element of G is unique.   3

   ii) If G is a group then for all $a, b \in G (a.b)^{-1} = b^{-1}.a^{-1}$.   3

   b) If G is a finite group and H is a subgroup of G then $O(H)$ is a divisor of $O(G)$.   7

   OR

   c) If N is a normal subgroup of G if and only if $g N g^{-1} = N$ for every $g \in G$ 6

   d) If ϕ is a homorphism of G into $\overline{G}$ with kernel K then K is a normal subgroup of G   7

6. a) Solve :   6

   $$\frac{d^3 y}{dx^3} + 2\frac{d^2 y}{dx^2} + \frac{dy}{dx} = e^{2x} + x^2 + x$$

   b) Find the particular integral of

   $(D^3 + 1)y = e^x \cos x + \sin 3x$ 6

   OR

c) Solve : $x^2 \dfrac{d^2y}{dx^2} - x\dfrac{dy}{dx} - 3y = x^2 \log x$

d) Solve : $(D^2 + 4)y = 4 \tan 2x.$ 6

7. a) Use the Laplace transformation to solve the following equation : $y'' - 2y' - 3y = 0, y(0) = 1,$ $y'(0) = 7$ 7

b) Find the Laplace transform of the function

  i) $f(t) = e^{at} t^n$ 3

  ii) $f(t) = a + bt + ct^2$ 3

OR

c) Use the Laplace transformation to solve the following initial value problem.   7

  $y'' + y = 2e^t$, $y(0) = y'(0) = 2.$

d) Find the inverse transform of

  i) $\dfrac{1}{p(p+1)^2}$ 3

  ii) $\dfrac{p+3}{p^2 + 2p + 10}$ 3

8 a) Solve the following cubic by Cardan's method : $35x^3 - 18x^2 + 1 = 0.$ 12

OR

Solve the following equation by Ferrari's method :

$x^4 - 4x^3 - 4x^2 - 24x + 15 = 0.$ 12

8. a) Solve : $p^2x^2 - 2xyp + 2y^2 - x^2 = 0$

   OR

   b) Solve : $y = 2xy - p^3$

9. a) Solve : $(D^2 + 4D + 5)y = x + \cos 2x$.

   OR

   b) Obtain the inverse transform of the following :

   i) $\dfrac{p+3}{p^3 + p^2 - 6p}$

   ii) $\dfrac{p}{(p+1)^2}$

10. a) Solve $xy'' - y' + (1 - x)y = xe^{-x}$

    OR

    b) Solve using Laplace Transform :

    $y'' + 2y' + 2y = 2$ given $y(0) = 0$, $y'(0) = 1$.

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Find the radius of curvature at any point (r, θ) on the cardioide $r = a(1 + \cos \theta)$.

   OR

   b) Find the asymptotes to the curve

   $3x^3 + 2x^2y - 7xy^2 + 2x^2 - 14xy + 7y^2 + 4x + 5y = 0$

2. a) Rectify the curve $x = a(t + \sin t)$, $y = a(1 + \cos t)$

   OR

   b) Find the surface of the solid generated by revolving the arc of the parabola $y^2 = 4ax$ bounded by its latus rectum about x-axis.

3. a) Find the equation of the sphere for which the circle $x^2 + y^2 + z^2 + 7y - 2z + 2 = 0 = 2x + 3y + 4z - 8$ is a great circle. Find the radius and centre of the sphere.

   OR

[Turn Over

b) Prove that the equation :

$4x^2 - y^2 + 2z^2 - 2xy - 3yz + 12x - 11y + 6z + 4 = 0$

represents a cone; find its vertex.

4. a) Find the equation of the right circular cylinder of radius 2 and whose axis passes through (1, 2, 3) and has direction ratios 2, − 2, 6.

OR

b) Find the equation of the tangent plane to the conicoid $2x^2 - 6y^2 + 3z^2 = 5$ which passes through the line $x + 9y = 0 = 3x - 3y + 6z - 5$.

5. a) Show that the function

$$f(x,y) = \begin{cases} xy\,\dfrac{x^2 - y^2}{x^2 + y^2}, & (x,y) \neq (0,0) \\ 0 & , (x,y) = (0,0) \end{cases}$$

is continuous at origin.

OR

b) If $u = (x^2 + y^2 + z^2)^{-\frac{1}{2}}$ prove that

i) $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} + z\dfrac{\partial u}{\partial z^2} = -u$

ii) $\dfrac{\partial^2 u}{\partial x^2} + \dfrac{\partial^2 u}{\partial y^2} + \dfrac{\partial^2 u}{\partial z^2} = 0$

6. a) Expand $e^x \tan^{-1} y$ about (1, 1) upto the second degree in (x− 1) and (y − 1)

OR

b) Test the function $f(x, y) = x^3 - y^3 + 3x^2 - 3y^2 - 9x$ for relative maxima, relative minima and saddle points if any.

7. a) Solve the IVP :

$9\,(y - 1)dy + (x - 3)dx = 0,\ \ y(3) = 0$

OR

b) Solve : $\dfrac{dy}{dx} + \dfrac{y}{x} = \dfrac{y^2}{x}\log x$

4. For steady flow of a liquid, derive poiseuille's equation and calculate the volume rate of liquid flow from the equation.   6 + 3

5. Set up and solve the differential equation for damped simple and harmonic motion. Discuss the underdamped case and show that there is logarithmic decrement of amplitude.   5 + 4

6. Derive the expression for the gravitational field intensity inside and outside a solid sphere of mass M and radius R. Plot the results as a function of the radial coordinate and find the value at the suface. How can you obtain the potential, given the intesity.   3+3+1+1 +1

7. Reduce the two-body central force problem to the equivalent one-body problem and deduce the energy equation for the Kepler problem and plot the energy diagram.   3 + 4 + 2

8. a) Derive Einstein's mass-energy equivalence relation.   5

   b) Show that the space-time interval between a pair of events is a Lorentz invariant.   4

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write short notes on any *four* of the following :

   a) i) Distinguish between inertial and non-inertial frames of reference.   2

      ii) Write the Galilean transformation equations and prove that Force in Newton's 2nd law is a Gallilean invariant.   2 + 2

   b) i) State Work-energy thorem and apply it to prove that a constant force is conservative in nature.   2 + 1

      ii) Calculate the work done when a black is moved through a distance on a horizontal table and is brought back to the starting point, given that coefficient of friction is 0.5.Is friction non-conservative ?   2 + 1

c) i) Define angular momentum of a particle about a point and calculate the angular momentum of a particle moving along the x-axis about the point (0, 5, 0). What is the direction of this angular momentum ? $1 + 3 + 1$

ii) What is the angular momentum in the above example if it is evaluated about an axis making an angle 30^0 with the z-axis ?   1

d) i) Define the three elastic constants. $1\frac{1}{2} \times 3$

ii) Define Poisson's ratio and state its limits. $1\frac{1}{2}$

e) i) Distinguish between inertial and gravitational mass of an object and establish their proportionality. $3 + 1$

ii) State the law of Universal gravitation due to Newton in vectorial form and depicts the forces in a diagram. $1 + 1$

f) Write the Lorentz transformation equations and derive the expression for length contraction. $2 + 4$

g) Calculate the moment of inertia of a solid cylinder about an axis perpendicular to its geometrical symmetry axis and passing through its centre of mass.   6

h) i) Calculate the mass of photons of wavelength emitted by sodium vapour lamp at 5893Å using mass-energy relation and the Plank-Einstein formula.   3

ii) What would be the velocity of a class of beings such that 1 year for us equals just a day for them ?   3

Group-B

2. Derive the equation of motion for a particle of mass m in moving with velocity $\vec{v}$ with respect to a rotating frame of angular velocity $\vec{\omega}$. Identify the centrifugal and coriolis accelerations of the particle from this equation. What is the correction to the acceleration due to gravity on earth surface at a latitude ϕ due to the centrifugal term ? $5 + 2 + 2$

3. a) Show that the angular momentum of a system of particles is the sum of angular momentum of the centre of mass about the reference point and the angular momentum about the centre mass.   5

b) State and prove the principle of conservation of angular momentum for such a system.   4

7. a) Give an account of different types defects commonly produced in crystals.   3

   b) Elaborate on the analysis power diffraction pattern of NaCl crystal.   6

   OR

   c) Describe diffrent types of symmetries and symmetry operations in Crystallography.   6

   d) Discuss on the classification of liquid crystals on the basis of molecular arrangement.   3

8. a) Derive an expression for the p^H of an aqueous solution of a salt of weak acid and weak base.   6

   b) Aqueous solution of ammonium chloride is acidic but that of sodium chloride is neutral– Explain.   3

   OR

   c) What is Solubility product principle ? Discuss the application of this principle in Qualitative analysis.   6

   d) Explain the terms–'Buffer Capacity' and 'Buffer range'.   3

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Group-A

1. a) State and explain the principle of equipartition of energy. Using this principle calculate the average internal energy of a molecule of carbon monoxide at 27^0C (K $=1.38 \times 10^{-23}$ JK^{-1}).   4+2

   OR

   b) i) Write a note on different types of molecular velocities used in the study of gases   4

      ii) Calculate the most probable velocity of SO_2 molecules at 227^0C.
          (R = 8.31 $\times$ 10^7 ergs K^{-1} mol^{-1}).   2

2. a) i) What are electrolytes ? Discuss their classification with suitable examples.   4

ii) Calculate the p^H of a decinormal solution of acetic acid which is 1.6 percent ionized. 2

OR

b) Write notes on the following : 4 + 2

i) p^H Scale

ii) Ionic product of water.

3. a) i) Outline the important characteristics of Solid State. 4

ii) Find out Miller indices of a crystal plane whose Weiss incices are 2a, 2b, 3c. 2

OR

b) i) Write an explanatory note on Bravis Lattice. 4

ii) Calculate the number of atoms per unit cell of bcc and fcc lattices. 2

4. a) What is meant by Buffer Solution ? Explain the buffer action of $NH_4OH - NH_4Cl$ buffer mixture. 6

OR

b) Derive an expression for the p^H of an acidic buffer solution. 6

Group-B

5. a) Derive an expression for the pressure exerted by the molecules of a gas on the basis of Kinetic theory. 9

OR

b) Deduce expressions for critical constants in terms of Van der Waals constants. 9

6. a) Define and explain the terms ; 'Surface tension and surface energy'. 3

b) Describe the Capillary rise method for determination of surface tension of liquids. 6

OR

c) Derive Ostwald dilution law for weak electrolytes. 3

d) Deduce exact expression for dissociation constant (K_a) of a weak monoprotic acid, HA. Show that the exact expression in reducible to the form,

$$\left[H_3 \overset{+}{O} \right] = \sqrt{K_a [HA]_0},$$

where $[HA]_0$ is the total concentration of the acid. 6

Group-B

2016

2. Describe meiosis-I in a plant meiocyte emphasising behaviour of chromosomes.   9

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

3. Describe the structure of an interphase nucleus highlighting organisation of chromatin.   9

Answer *five* questions including Q.No1 which is compulsory

4. Describe the fluid mosaic model of plasmamembrane and explain the role of proteins present in it.   6 + 3

Group-A

5. Elaborate the structure of B-DNA with labelled diagram. Explain the features on which replication and transcription proceeds.   6 + 3

1. Write notes on any *four* of the following :   6 × 4

   a) Golgi-Apparatus .

6. Define carbohydrades and give an outline classification of the group. Explain the structure of starch and cellulose.   3 + 6

   b) Isoelectric point.

   c) Origin of eukaryotic cell

7. Explain the mechanism of enzyme action in cells.   9

   d) Microtubules

   e) Feedback inhibition

8. Give in detail the structure and function of Mitochondria with special emphasis on its semi autonomous role.   9

   f) Eukaryotic cell cycle

   g) Coupled reactions

   h) Disachharides.

Group-B

2. Discuss temperature as an ecological factor.   9

3. Describe patterns of population growth.   9

4. Give an account of ecological succession.   9

5. Discuss nitrogen cycle.   9

6. Discuss levels of Biodiversity and its significance.   9

7. Give an account of energy flow through ecosystem.   9

8. Explain Gause's principle with laboratory and field examples.   9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write notes on any *four* of the following :   6 × 4

   a) Laws of limiting factors.

   b) Natality and mortality

   c) Community characteristics

   d) Lithosere

   e) Food chain

   f) Sulphur cycle

   g) In-situ conservation of Biodiversity

   h) Role of WWF.

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1
which is compulsory

Group-A

1. Write notes on any ***eight*** of the following : 3×8

    a) $(11001111)_2 = (?)_8$, $(230)_8 = (?)_2$

    b) Define logic gates. Name some logic gates

    c) Define Flip-Flop. Name some flip-flops available.

    d) Explain the functionality of the control unit

    e) How indexing and arrays are related ?

    f) What is the major difference between stack and queue ?

[Turn Over

g) Write the difference between RAM and ROM in brief.

h) What is Addressing Mode ?

i) What is Flash Memory ?

j) What is Subrooting ?

Group-B

2. Draw a Karnaugh map for the following function of four variables and use it to reduce the function. How you will realize the reduced function by using   9

   i) NAND gates

   ii) NOR gates, $F = \sum m(0, 1, 4, 5, 12, 13, 8, 9, 6, 14)$

3. a) What are universal gates and they are called so ? Give truth table of at least two distinct universal gates.   2 + 2 +2

   b) Convert the following numbers to decimal equivalent.   3

      i) $(670)_8 = (?)_{16}$

      ii) $(1035)_8 = (?)_{10}$

4. a) Describe the working of a RS-flip-flop. How it differs from D flip-flop.   5

   b) Write short notes on Decoders in briefly.   4

5. a) What is a ripple counter ? How it works ? Explain with logic diagram.   5

   b) Write short notes on Multiplexers in briefly.   4

6. a) Is the ALU part of a CPU ? What about memory ? Discuss their functions.   5

   b) Add +9 and –8 using 2's complement in 8bits and Express –6 in 2's complements form.   4

7. a) Write the differences between Stack and Queue.   5

   b) Write short notes on Subroutines in briefly.   4

8. a) Write short notes on **three** of the following : 3×3

      i) Flash Memory

      ii) Static Memories

      iii) Asynchronous DRAMS

      iv) RAMBUS Memory.

ii) Let $T : R^2 \to R^3$ be a linear transformation such that $T(x_1, x_2) = (x_1-2x_2, -x_1 + 3x_2, 3x_1-2x_2)$ Find x such that $T(x) = (-1, 4, 9)$.   4½

6. i) Define linear transformation. If $T : R^n \to R^m$ be a linear transformation and A be the standard matrix for T, then prove that T is one-to-one iff the columns of A are linearly independent.   2+6

ii) Determine if the linear transformation $T : R^4 \to R^4$ defined by   4½
$T(x_1, x_2, x_3, x_4) = (0, x_1+ x_2, x_2 + x_3, x_3+x_4)$ is (a) one-to-one (b) onto

7. i) Prove that the eigenvalues of a triangular matrix are the entries on its main diagonal.   6

ii) Find the characteristic polynomial of the matrix A and find the eigen values with multiplicity.

$$A = \begin{bmatrix} 4 & -7 & 0 & 2 \\ 0 & 3 & -4 & 6 \\ 0 & 0 & 3 & -8 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$ 6½

8. i) Prove by mathematical induction that $1^2 -2^2 +3^2 - 4^2 +\ldots + (-1)^{n-1} n^2 = (-1)^{n-1} n(n + 1)$, for all $n \geq 1$.   6½

ii) For any integer $n \geq 1, 2^{2n} - 1$ is divisible by 3.   6

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer on any *four* of the following :   7½×4

a) Solve : $z^4 = 5(z - 1)(z^2 - z + 1)$.

b) Show that the product of all the straight lines that can be drawn from one of the angles of a regular polygon of n sides in a circle of radius a to all other angular points is na^{n-1}.

c) Prove that given integers a and b, not both of which are zero, there exists integers m and n such that $g = gcd(a, b) = ma + nb$.

d) For a, b ∈ N define a ~ b if and only if $a^2 +b$ is even. Prove that ~ defines an equivalance relation on N and find the quotient set determined by ~.

e) Row reduce the matrix

$$A = \begin{bmatrix} 0 & -3 & -6 & 4 & 9 \\ -1 & -2 & -1 & 3 & 1 \\ -2 & -3 & 0 & 3 & -1 \\ 1 & 4 & 5 & -9 & -7 \end{bmatrix}$$

into echelon form and locate the pivot columns of A.

f) Find a basis for the nullspace of the matrix

$$A = \begin{bmatrix} 4 & 5 & 9 & -2 \\ 6 & 5 & 1 & 12 \\ 3 & 4 & 8 & -3 \end{bmatrix}$$

g) Let $V_1 = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$, $V_2 = \begin{bmatrix} 5 \\ 5 \\ 6 \end{bmatrix}$, $V_3 = \begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$

i) Determine whether $\{v_1, v_2, v_3\}$ is linearly independent or not.

ii) If possible, find a linear dependence relation among v_1, v_2, v_3.

h) Is $\lambda = 3$ an eigenvalue of $\begin{pmatrix} 1 & 2 & 2 \\ 3 & -2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$?

If so find the one corresponding eigenvector.

Group-B

2. State and prove Demoivre's theorem for rational indices and find the cube roots of $z = 2 + 2i$.   2+6+4½

3. i) Given any natural number $n > 1$, prove that there exists a prime p such that $p|n$. Also using it show that there are infinetly many primes.   6 + 3

   ii) Is $2^{15} - 1$ prime ? Explain   3½

4. i) Write the matrix equation

$$\begin{bmatrix} 5 & 1 & -8 & 4 \\ -2 & -7 & 3 & -5 \end{bmatrix} \begin{bmatrix} 5 \\ -1 \\ 3 \\ 2 \end{bmatrix} = \begin{bmatrix} -8 \\ 16 \end{bmatrix}$$

   as vector equation.   6½

   ii) Write the solution of the given homogeneous system in parametric vector form.   6
$$x_1 + 3x_2 + x_3 = 0$$
$$-4x_1 - 9x_2 + 2x_3 = 0$$
$$-3x_2 - 6x_3 = 0$$

5. i) Define Invertible matrix. If A is an $n \times n$ invertible matrix, then for each in R^n the equation $Ax = b$ has the unique solution $x = A^{-1}b$.   2 + 6

b) Explain how a Bill becomes Law.

4. a) Discuss the role of Comptroller and Auditor General of India. 12½

OR

b) Examine the role of Executive in Law Making.

V-180-1 ◻◻

2016

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Group-A

1. a) Write short notes on Members of Parliament. 7½

OR

b) Explain the election procedure of members of State Legislative Assembly and their functions.

2. a) Analyse the procedure of preparation of a Bill. 7½

OR

b) Write short notes on Estimates Committees.

Group-B

3. a) Discuss the functions of Gram Panchayat. 12½

OR

4. a) Define Holder and Holder-in-due course. Explain the previlages enjoyed by Holder-in-due course. 6 + 14

OR

b) Define cheques. Explain different kinds of cheques alongwith crossing of cheques. 6+8+6

5. a) What are different classes of resolutions which may be passed by a company ? Explain where special resolution is necessary. 10 +10

OR

b) Procedure for forfeiture of shares. 10

c) Winding up by the Tribunal. 10

2016

Full Marks - 100

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) "No consideration no contract". Explain. 20

OR

b) "All contracts are agreement but all agreements are not contract. 20

2. a) Explain the methods of creating Agency. 20

OR

b) Explain the duties of the Bailor. 20

3. a) Distinguish between sales and Hire-purchase agreement. 10

b) Distinguish between conditions and warranties. 10

OR

c) "No Seller can give the buyer of goods a better title to the goods than he himself has". Explain the statement. 20

Group-B

2. Briefly describe the concept of plate Tectonics.   9

3. Briefly describe the Island Arcs   9

4. Discuss the various theories of Isostasy.   9

5. Describe the various types of Geosynclines with example.   9

6. Describe different types of Aerial Photography.   9

7. Describe the application of Remote sensing in Geomorphology.

8. Give a suitable scheme of classification of marine sediments.   9

V-316-0.3   ▢▢

2016

Full Marks - 60

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Write notes on any *four* of the following :   6 × 4

   a) Types of plate boundaries

   b) Epiorogenesis

   c) Continental Drift

   d) Scale of Aerial Photograph

   e) Drift and Crab

   f) FCC

   g) Principle of Remote Sensing

   h) Coral Reefs.

[Turn Over

2016

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *two* questions from each group

Group-A

1. Write a brief note on 'e' banking.   7½

2. Mention the procedure for closing accounts.   7½

3. What is banker's cheques ? Mention its advantages to the bank.   7½

4. Distinguish between Primary Market and Secondary Market   7½

Group-B

5. Explain any two major changes in the functioning of Indian Banking.   12½

6. Discuss the general procedures for opening an account. Point out the general precautions to be taken by a Bank.   12½

7. Metion different types of Bank accounts and their features.   12½

8. What is Money Market ? Analyse its constituents.   12½

2016

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *three* questions including Q.No1

which is compulsory

Group-A

1. Write short notes on any *two* of the following : 7½×2
    a) Meaning of 'antiquity'
    b) Tangible heritage
    c) Tajmahal
    d) Sun temple at Konark.

Group-B

2. Write a note on the five important archaeological sites of India.   12½

3. Discuss about the principal museum-regulatory bodies of India.   12½

4. Point out the effective steps to be taken for checking smuggling of antiquity.   12½

5. Write an essay on the management of Heritage sites.   12½

7. What do you mean by correlation ? Distinguish between positive correlation and negative correlation. Show that the limit of correlation coefficient lies in between –1 to +1.   9

8. Explain what are regression lines ? Why are there two regression lines ? Find the angle between two lines of regression and state when the two lines will be perpendicular to each other and when they will be coincident.   9

V-308-0.5   □□

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1

which is compulsory

Group-A

1. Answer any *four* of the following :   6 × 4

   a) What are the various sources of collecting Secondary data ?

   b) What do you mean by classification of data ? Explain the various types of classification with examples.

   c) Show that $AM \geq GM \geq HM$

   d) Find the AM and SD of 1, 2, 3.....n

   e) The AM and SD of a series of 20 items were calculated by a student as 20cm and 5cm respectively. But while calculating them an item 13 was misread as 30. Find the correct AM and SD.

f) The coefficient of variation of series is 48%. The mode of the series is 264 and its SD is 96. Find coefficient of Skewness.

g) Show that correletion coefficient r between two variables X and Y is given by

$$\gamma = \frac{\sigma_x^2 + \sigma_y^2 - \sigma_{x-y}^2}{2\sigma_x \sigma_y .}$$

Where σ_x, σ_y and σ_{x-y} are S.D of x, y and x − y respectively

h) The equations of two regression lines obtained in a correlation analysis are as follows.
3x + 12y = 19   3y + 9x = 46.
Obtain the value of

i) Correlation coefficient

ii) $\overline{X}$ and $\overline{Y}$

iii) The ratio of coefficient of variability of X to that of Y

Group-B

2. What is tabulation of data ? Write the objectives of tabulation ? Discuss the various parts of a table?   9

3. Define Arithmetic mean ? State and Prove its important properties ? Why AM is considered as an ideal average ?   9

4. Write the difference between mean deviation and standard deviation. Prove that for any discrete distribution standard deviation is not less than mean deviation from mean.   9

5. Define Skewness ? Discuss the various measures of Skewness ? Write the difference between Dispersion and Skewness.   9

6. For a distribution mean is 10 and variance is 16. $\gamma_1 = +1$ and $\beta_2 = 4$. Obtain the first four moments about the origin. Comment upon the nature of the distribution.   9

b) In any Case,

I set you free from all your obligations. You are not to feel yourself bound in the slightest way, any more than I shall. There must be perfect freedom on both sides.

OR

But our home has been nothing but a playroom. I have been your doll-wife, just as at home I was Papa's doll-child ; and here the children have my dolls.

□□

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer the following in one sentence each : 1×10

   a) Why is Chaucer famous in English literature ?

   b) What was the source of Miracle Plays ?

   c) Who is the author of *Utopia* ?

   d) What was the contribution of Earl of Surrey and Thomas Wyatt in English Literature ?

   e) Who is the author of 'The Faerie Queen' ?

   f) Name one play written by Ben Jonson.

   g) When was the Authorized Version of the Bible Published ?

   h) By whom was the play 'Duchess of Malfi' written ?

[Turn Over

i) Why is the year 1642 important in the history of British drama ?

j) Name the most important dramatist among the University Wits.

2. Write short notes on any *three* of the following :

5 × 3

i) Shakespearean Sonnet

ii) Translation of the classics during the Elizabethan period

iii) Influence of Seneca on British drama

iv) Conciets in John Donne's poems

v) Restoration Drama.

3. a) Consider 'Dr. Faustus' as a Christian Play. 15

OR

b) Sketch the character of Dr. Faustus.

4. a) Discuss 'A Doll's House' as a problem play. 15

OR

b) Make an assessment of the character of Nora.

5. Write short notes on any *two* of the following : 7½ × 2

i) Elegy

ii) Ode

iii) Tragic hero

iv) Difference between Tale and Novel.

6. Annotate the following : 5 × 2

a) I see there is virtue in my heavenly words'
Who would not be proficient in this art ?
How pliant is this Mephistophilis,
Full of obedience and humility !

OR

Was this the face that launched a thousand ships,
And burnt the topless towers of Ilium?
Sweet Helen, make me immortal with a kiss.

3. a) Discuss the equilibrium of the firm and industry in short run under perfect competition.

OR

b) Explain how price and output are determined in the long run under monopolistic competition.

4. a) 'Rent does not enter into Cost of Production ? Discuss.

OR

b) Explain the liquidity preference theory of interest and point out the limitations.

5. a) What is welfare economics ? Discuss the problems in measuring welfare in an economy.

OR

b) Critically examine the Paretian welfare criteria of welfare economics.

V-358-0.2 ▢▢

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Explain how a consumer attains equilibrium through indifference curve technique.

OR

b) Examine the concept of consumer's surplus. Show how it can be measured through indifference curve analysis.

2. a) Critically examine the law of variable proportions.

OR

b) 'Short run average cost curve must be 'U' shaped, long run cost curve is not necessarily 'U' shaped ? Discuss.

[Turn Over

b) Assess the achievments of Kaniska I..

4. a) Estimate the achievements of Gautamiputra Satakarni.

OR

b) Describe the conquests of Samudragupta.

5. a) Discuss the causes and effects of the Arab invasion of Sindh.

OR

b) Give an account of the invasion of India by Muhammad of Ghor.

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Discuss the important sources of ancient Indian history.

OR

b) Give an account of the social, economic and religious life of the later Vedic people.

2. a) Examine the political condition of India during the 6th Century B.C.

OR

b) Discuss the main principles of Jainism.

3. a) Review the missionary activities of Ashoka.

OR

b) Define Law and discuss its various sources.

4. a) "Equality does not mean indentity of treatment". Explain.

OR

b) Examine various Theories of Rights.

5. a) What do you mean by Civil Society ? Examine its role and importance in the present era.

OR

b) What is Feminism ? Discuss the main features of Feminism.

□□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) Examine the nature and the expanding scope of the Study of Political Science.

OR

b) Discuss the taditional methods of the Study of Political Science.

2. a) Critically examine the Social Contract Theory of the Origin of State.

OR

b) Discuss the Liberal Theory of democracy.

3. a) Critically discuss Monistic Theory of Sovereignty.

OR

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prove that :   8 + 8

   a) The middle term must be distributed at least once in the premises.

   b) From two particular premises, no conclusion follows.

   OR

   Determine the valid moods in 1st Figure.   16

2. Explain how symbolic Logic is a development of classical Logic.   16

   OR

   What is Truth-Function ? Construct truth tables for the following Truth-Functions.   4+6+6

   a) Conjuctive Function

   b) Impliative Function.

3. Construct Truth-tables for the following expressions and say which of them are tautologies.   8+8

   a) $((p \supset q) \cdot \sim q) \supset \sim p$

   b) $((p \supset q) \cdot (q \supset r) \supset (P \supset r)$

   OR

   Test the validity of the following arguments by indirect truth-table method   8 + 8

   a) $((p \supset q) \cdot p) \supset q$

   b) $((p \supset q) \cdot \sim q) \supset \sim p.$

4. Reduce the following formula to their CNF and say which of them are tautologies.   8 + 8

   a) $((p \supset q) \cdot (q \supset r)) \supset (p \supset r)$

   b) $((p \supset q) \cdot \sim q) \supset \sim p.$

   OR

   Test the validity of the following arguments by the method of equivalent sustitution.   8 + 8

   a) If the cost of living rises or government revenues increase, then salary increase will be granted. No salary increases will be granted. Therefore, government revenues will not increase.

   b) If the police do not catch the murderer within a weak, then there will be a public outcry. If there is a public outcry, then the chief of the police will resign. The chief of the police will not resign. Therefore, the police will catch the murderer within a weak.

5. Distinguish between :   8 + 8

   a) Free variables and bound variables

   b) Universal Quantifiers and Particular Quantifiers.

   OR

   Put the following Boolean expressions into normal form :   8 + 8

   a) $A' + AC + ABC' + AB'C'$

   b) $AB + A'C + C'.$

ଖ) ଯେ କୌଣସି *ଗୋଟିକର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ :   ୫

i) କେଦାର ଗୌରୀ

ii) ତପସ୍ୱିନୀ

iii) କାଳିଜାଇ ।

୩. କ) ଅନ୍ତଦାଶଙ୍କର ରାୟ କବିତାରେ ନୂତନ ସମାଜ ସୃଷ୍ଟିର ପ୍ରେରଣା
କିପରି ପ୍ରଦାନ କରିଛନ୍ତି ଉଲ୍ଲେଖ କର ।   ୧୫

ଅଥବା

ସଚ୍ଚିଦାନନ୍ଦ ରାଉତରାୟ ପ୍ରଗତିବାଦର ସାର୍ଥକ ବାର୍ତ୍ତାବହ–ଆଲୋଚନା
କର ।

ଖ) ଯେ କୌଣସି *ଗୋଟିକର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ :   ୫

i) ସବୁଜ କବିତା

ii) ମାଟିର ମଣିଷ

iii) ବାଜି ରାଉତ

୪. କ) ଓଡ଼ିଆ ଭାଷା ଦୃଷ୍ଟିରୁ ଚର୍ଯ୍ୟାପଦର ଭାଷାତତ୍ତ୍ୱିକ ଅଧ୍ୟୟନ କର । ୧୫

ଅଥବା

ଷୋଡଶ ଶତକ ପର୍ଯ୍ୟନ୍ତ ଓଡ଼ିଆ ଭାଷାର ଉତ୍ପତ୍ତି ଓ କ୍ରମବିକାଶ ଦର୍ଶାଅ ।

ଖ) ଯେ କୌଣସି *ଗୋଟିକର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ :   ୫

i) ଓଡ଼ିଆ ଶବ୍ଦ ଭଣ୍ଡାରର ବିଭାଗୀକରଣ

ii) ଓଡ଼ିଆ ଭାଷାରେ ଇଂରାଜୀ ପ୍ରଭାବ

iii) ଦେଶଜ ଶବ୍ଦ ।

□□

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

୧ . କ) ସାରଳା ସାହିତ୍ୟରୁ ସମକାଳୀନ ସମାଜର ଚିତ୍ର ପ୍ରଦାନ କର ।   ୧୫

ଅଥବା

ଜଗନ୍ନାଥ ଦାସଙ୍କ ଭାଗବତର ଜନପ୍ରିୟତାର କାରଣ ଅନୁସନ୍ଧାନ
କର ।

ଖ) ଯେ କୌଣସି *ଗୋଟିକର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ :   ୫

i)   ବଟ ଅବକାଶ

ii) ବୈଦେହୀଶ ବିଳାସ

iii) ବିଳଙ୍କା ରାମାୟଣ ।

୨. କ) ଫକୀର ମୋହନଙ୍କ ଉପନ୍ୟାସରେ ଗ୍ରାମ୍ୟ–ଜୀବନ କିପରି ରୂପାୟିତ
ହୋଇଛି ବର୍ଣ୍ଣନ କର ।   ୧୫

ଅଥବା

ଗୋପବନ୍ଧୁଙ୍କ ସ୍ୱଦେଶ–ପ୍ରୀତିର ପରିଚୟ ଦିଅ ।

2016

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

୧. ଯେ କୌଣସି **ଦୁଇଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଲେଖ ।   ୭½×୨

    କ) ବିଜ୍ଞାପନରେ ଲୋକ ସାହିତ୍ୟର ଭୂମିକା

    ଖ) ବିଜ୍ଞାପନର ଭାଷାଶୈଳୀ

    ଗ) ବିଜ୍ଞାପନର ଉପଯୋଗିତା

    ଘ) ବିଜ୍ଞାପନ ପ୍ରସ୍ତୁତ କାଳୀନ ସତର୍କତା ।

୨. ଯେ କୌଣସି **ଦୁଇଟିର** ଦୀର୍ଘ ଉତ୍ତର ଦିଅ ।   ୧୨½×୨

    କ) ବିଜ୍ଞାପନର ଲକ୍ଷ୍ୟ ଓ ପ୍ରକାର ସଂପର୍କରେ ଆଲୋଚନା କର ।

    ଖ) ବିଜ୍ଞାପନର ପରଂପରା ଓ ଇତିହାସ ଉପରେ ଆଲୋକପାତ କର ।

    ଗ) ବିଜ୍ଞାପନ ପ୍ରସ୍ତୁତ ପ୍ରଣାଳୀର ବିଭିନ୍ନ ସୋପାନ ବର୍ଣ୍ଣନ କର ।

    ଘ) ବିଜ୍ଞାପନର ଭାଷା ଓ ଆଇନଗତ ଦିଗ ଉଲ୍ଲେଖ କର ।

□□

[2]

What are the advantages and disadvanages of decentralisation ?

4. Explain McGregor's Theory X and Theory Y. How this theory is an improvement over the traditional view that you can motivate emplyees by paying them more money ?

OR

Explain and evaluate different styles of leadership.

5. Write short notes on the following :

a) Break-even analysis

b) Budgeting

c) Management Audit

d) CPM and PERT.

OR

What do you understand by "Planned Change" ? Explain the steps involved in the process of planned change.

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. What is contingency approach to management ? Crtically evaluate the contingency approach.

OR

Describe in brief the management process.

2. What is decision making ? Discuss the steps involved in the process of decision making.

OR

Explain the concept of environment analysis in the light of SWOT analysis.

3. What do you mean by authority ? Explain the different theories of authority.

OR

Group-B

2. Define Human Resource Management and discuss its functions. 12½

3. What do you mean by human resource planning ? Explain the need and importance of human resource planning. 12½

4. Briefly discuss various sources of recruitment. 12½

5. Define the term training and outline the importance of training. 12½

6. What is performance appraisal ? Discuss modern methods of performance appraisal. 12½

7. Explain the importance of industrial safety. Discuss common procedures followed for ensuring safety in industry. 12½

8. What are the causes of industrial disputes ? Describe briefly different mechanisms employed for settlement of industrial disputes. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No 1

which is compulsory

Group-A

1. Write notes on any *four* of the following : 7½ × 4

   a) Explain the objectives of Human Resources Management

   b) Write a note on emerging challenges of HRM.

   c) What are the uses of 'job analysis' ?

   d) Explain the benefits of 'Job description'.

   e) What are the benefits of training to the organisation ?

   f) What are the differences between training and development ?

   g) What are the essentials of a sound wage incentive plan ?

   h) What are the steps in 'Grievance handling' ?

3. What is an isoquant ? Explain the properties of an isoquant.

4. Why is short run average cost curve "U" shaped ? Explain.

5. Analyse the longrun equlibrium of firm and industry under Perfect competition.

6. Describe the shift in demand curve and the absence of supply curve in a monopoly market.

7. "A monopolistic competition market is less efficient in longrun as compared to a perfectly competitive market". Discuss.

8. How is price determined in a collective Oligopoly ? Explain.

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No 1
which is compulsory

Group-A

1. Write short notes on any *four* of the following :   7½×4

   a) Cross Elasticity of Demand.

   b) Engel curve

   c) Mariginal rate of technical substitution.

   d) Producers surplus under perfect competition.

   e) Horizontal and vertical integration of firms

   f) Oligopoly

   g) Expansion Path.

Group-B

2. Describe the shape of average revenue curve and marginal revenue curve under monopoly

[2]

h) Discuss circular flow of income and expenditure.

Group-B

2. Discuss in details the 'Basic Economic Problems of an economy'. 12½

3. Define price elasticity of demand. Distinguish between price elasticity and income elastisity of demand. 12½

4. Define Total Revenue (TR), Average Revenue (AR) and Mariginal Revenue (MR). Show the relationship between TR, AR and MR. 12½

5. State and explain the 'Law of Supply'. What are the asumptions of the law? Why does the supply curve slope upward? 12½

6. Define Average Cost (AC) and Mariginal Cost (MC). Why is the short-run Average Cost Curve 'U' shaped? Show the relationship between average cost (Ac) and mariginal cost (MC) in the short-run. 12½

7. Explain with diagrams the equilibrium of a firm under perfect competition in the short-run. 12½

8. Define monopoly. Explain how price is determined under monopoly. 12½

2016

Full Marks - 80

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No 1

which is compulsory

Group-A

1. Write short notes on any *four* of the following: 7½ ×4

a) Distinguish between micro and macro economics. What is the place of microeconomics in economic theory?

b) What is demand? Distinguish between a change in demand and a change in quantity demand.

c) Define 'Elasticity of Demand'. Discuss the factors that determine elastisity of demand.

d) What do you mean by supply? Discuss the factors determining supply.

e) Distinguish between 'Accounting Costs' and 'Economic costs' and 'Fixed costs' and 'variable costs'

f) Write a note on 'Economies and Diseconomies of Scale'

g) Distinguish between perfect competition and monopoly. What are the features of perfect comptition.

[2]

b) What is meant by entrepreneurial motivation ? Discuss "Maslows's Need Hierachy Theory".

4. What do you mean by EDPS ? Explain the need for and objectives of EDP.

OR

Write notes on the following :

a) SIDBI

b) DIC

c) SISI

d) Industrial Estates.

5. a) Discuss the role played by small entrepreneurs in the economic development of a country.

OR

b) Explain the role of institutional agencies in export promotion.

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. Define women entrepreneur. Describe reasons for slow progress of women entrepreneurs in India.

OR

Distinguish between:

a) Entrepreneur and Intrapreneur

b) Entrepreneur and Professional Manager.

2. a) What are the legal formalities and documentation required for establishment of a new enterprise ?

OR

b) Define social responsibility of business and explain its need for the business enterprises.

3. a) Define innovation and explain different forms of innovation.

OR

[2]

b) Discuss various types of plans.

4. a) What do you understand by 'Span of Control' in business management ? Examine the factors that determine the span of control.

OR

b) What do you understand by motivation ? Discuss the part played by the leader in promoting motivation.

5. a) Understanding control really means understanding three principal things about it. What is control ? Who is controlled ? Who controls ? Discuss.

OR

b) Explain the essential functions of a Stock Exchange.

V-364-0.3 □□

(Back)

2016

Full Marks - 100

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. a) The one-man control is the best in the world if that one man is big enough to manage every thing. Comment.

OR

b) Briefly explain the various divisions or components of business.

2. a) If you want to start a business in partnership with certain other people, what precautions ought you to take so as to avoid future disputes and consequent litigation ?

OR

b) What do you understand by a Memorandum of Association ?

3. a) Comment on the true nature of Management. Is it a science or an art ?

OR

g) Write an essay on Public Service Guarantee Act.

h) Discuss on Right to Information.

Group-B

2. Distinguish between Government and Governance and the significance of Governance. 12½

3. Examine the role of the state in the era of economic liberalisation with special reference to India. 12½

4. Do you think that good governance can be possible without democracy ? Justify your answer. 12½

5. What is sustainable development ? Explain its characteristics. 12½

6. Examine the major challenges to decentralized governance 12½

7. What do you mean by electronic governance ? Discuss various initiatives of the Government through e-governance. 12½

8. Write an essay on Corporate Social Responsibility. 12½

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following: 7½×4

a) Explain the meaning and subject "good governance.

b) Explain the impact of Globalisation on the Indian administration.

c) Discuss the characteristics of Good Governance.

d) Discuss the changing dimensions of development.

e) Examine the relationship between environment and development in the context of rapid industrialisation.

f) Discuss the concept of Democratic Decentralisation.

8. If X_1, X_2 ..... X_n be random sample from $N(\theta, \sigma^2 e)$ where σ^2 is known, find the shortest Confidence Interval.	9

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1

which is compulsory

Group-A

1. Answer any *four* of the following in short :	6 × 4

   a)	Define an estimator and explain how it is different from a statistic.

   b)	With suitable examples discuss the characteristics of an estimator.

   c)	Write a short note on confidence belt.

   d)	Explain how a shortest confidence interval is obtained.

   e)	Give an idea of confidence sets.

   f)	For a random sampling from Normal Population $N(\mu, \sigma^2)$ find MLE for μ when σ^2 is known.

g) A random sample is obtained from a normal population with mean μ and variance σ^2, find an MLE for simultaneous estimation of μ and σ^2.

h) When μ is known find on MLE for σ^2 for a random sampling from normal population with mean μ and Variance σ^2.

Group-B

2. If X_1, X_2 and X_3 are random samples of size 3 from a population with mean μ and variance σ^2. T_1, T_2 and T_3 are the estimators used to estimate mean value μ where 9

$$T_1 = X_1 + X_2 - X_3$$

$$T_2 = 2X_1 + 3X_2 - 4X_3$$

$$T_3 = \frac{\lambda X_1 + X_2 + X_3}{3}$$

i) Are T_1 and T_2 unbiased estimators

ii) Find the value of λ such that T_3 is an unbiased estimator for μ.

iii) With this value of λ is T_3 a consistent estmator.

iv) Which is the best estimator ?

3. What is Black Wellisation. State and Prove Rao-Blackwell theorem. 9

4. What is minimum variance unbiased estimator (MVUE) Show that an M.V.U is unique. 9

5. What are the different methods of Estimation ? Discuss the method of maximum likelihood estimator. What are the properties of maximum likelihood estimator. 9

6. Define Confidence Intervals and Confidence Limits. How is it obtained ? 9

7. Obtain $100(1 - \alpha)\%$ confidence intervals for the parameters (a) θ (b) σ^2 of the normal distribution

$$f(x, \theta, \sigma) = \frac{1}{\sigma \sqrt{2\pi}} \, e^{-\frac{1}{2}\left(\frac{x-\theta}{\mu}\right)^2}$$

$$-\infty < x < \infty.$$ 9

Group-B

2. Give an account of the concept, definition and importance of Environment. 12½

3. Write a note an Natural Vegetation and Wildlife. 12½

4. Discuss about indegenous knowledge system on Environment and Societies. 12½

5. Explain Human Environment in relation to settlement and Agriculture. 12½

6. Make an estimate of the impact of modern Industries on Environment. 12½

7. What is Pollution ? Analyse the types of pollution and their impact on Enviroment. 12½

8. Describe the various Anti-pollution Movements undertaken in Independent India. 12½

□□

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 7½×4

a) Environment in Vedas

b) Natural Vegetation

c) Ecology of Hills amd Mountains

d) Water and Irrigation

e) New Regimes of Land

f) Degradation

g) The Issues of Dams

h) The Issues of Displacement.

[Turn Over

Group-B

2. What are the characteristics of the basic competitive model ? Discuss the role of prices, property rights and profits for efficient working of the market. 12½

3. Analyse how the demand schedule and the demand curve are related. Why does the demand curve slope downwards to the right ? 12½

4. What is price elasticity of demand ? Explain the measurement of price elasticity of demand by piont method. 12½

5. Illustrate consumer's optimum choice with the help of indifference curve analysis. 12½

6. Define budget line. What causes shift in the budget line ? What does the slope of the budget line measure. 12½

7. Explain the equilibrium of the firm opertating under the conditions of perfect competition. 12½

8. Show how under perfect competition price of labour is equal to its value of marginal product. 12½

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No 1

which is compulsory

Group-A

1. Answer any *four* of the following : 7½×4

   a) Show how problem of scarcity causes problem of chioce.

   b) Discuss three basic problems faced by an economy.

   c) Distinguish between movement along the demand curve and shift in the demand curve.

   d) Write a brief note on consumer surplus.

   e) Indifference curve is convex to the origin. Analyse.

   f) Income effect is always positive. Do you agree with the statement ? Give reasons.

   g) State how anti-trust policy prevents monopoly practices.

   h) Demand for a factor is derived demand. Examine.

[Turn Over

Group-B

2. Explain the principles of Logic and point out their interrelations. 12½

3. What is distribution of terms ? Determine the terms distributed and undistributed in A, E, I and O propositions. 12½

4. Explain the different forms of opposition of propositions. Is sub-alternation a form of proposition. 12½

5. Distinguish between Partial Contrapositive and full contrapositive. Show that I can not be contraposed. 12½

6. What is mood ? Determine the valid moods of different figures of syllogism. 12½

7. Distinguish between direct reduction and indirect reduction. Is reduction necessary ? 12½

8. Explain the different kinds of hypotheses with suitable examples. 12½

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following : 7½×4

   a) Explain with example the different parts of a proposition.

   b) Explain the nature of Categorical Proposition.

   c) Show that O cannot be converted.

   d) Explain with example the fallacy of Illicit Process of minor term.

   e) Distinguish between First Figure and Fourth Figure.

   f) In what figures is the mood AEE valid.

   g) Reduce 'CAMESTRES' directly.

   h) Describe the situation when the framing of a hypothesis is necessary.

h) Write a note on socialculturia and education.

Group-B

2. State the constitutional provisions of Indian education that reflect secularism and social justice. 9

3. Explain R.N Tagore's Liberationist pedagogy in the context of philosophy and practice of education. 9

4. Discuss the concerns and issues as regards universalisation of school education in India. 9

5. Explain the provisions for equality of educational opportunity in India. 9

6. Discuss the inequalities prevailing in the school systems-Public and Private, Rural and urban in our state. 9

7. Write the recommendations of Education Commission (1964-66) on education for national development. 9

8. Explain the emerging trends in the interface between economic development and Education. 9

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1

which is compulsory

Group-A

1. Answer any *four* of the following : 6 × 4

a) Explain what is meant by normative orientation of Indian education.

b) What are the aims of education drawn from the normative vision ?

c) Explain the aims of Sri Aurobindo's Integral education.

d) Explain the concerns for universal enrolment in school education.

e) Discuss the nature of inequality prevailing in dominant and minors group's education in India.

f) Elaborate the idea of common school system in India.

g) Explain the trend in the interface between political process and education.

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *five* questions including Q.No1
which is compulsory

Group-A

1. Answer any *four* of the following :   7½×4

    a) Discuss the differences between Sociology and Political Science.

    b) Discuss briefly the characteristics of culture.

    c) Write a brief note on Social norms.

    d) Discuss briefly the characteristics of primary group.

    e) Define caste and discuss briefly its characteristics.

    f) Write a brief note on Power.

    g) Discuss briefly the formal means of social control.

    h) Discuss the characteristics of competion.

Group-B

2. Define sociology and discuss its scope.   12½

3. Define community and discuss its characteristics. 12½

4. Define Secondary group and analyse the characteristics of the secondary group.   12½

5. Discuss briefly the functionalst theory of social stratification.   12½

6. Define social mobility and discuss its determinants.   12½

7. Define social control and discuss the informal means of social control.   12½

8. Analyse conflict as a dissociative social process. 12½

Describe the functions of the different parts of the human brain.

4. What is consciousness ? Discuss the changes in consciousness.

OR

Describe briefly the different extended states of consciousness.

2016

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

1. What is psychology ? Discuss the origin and development of psychology.

OR

Describe the behavioural and humanistic approach in studing behaviour and find out the basic differences between them.

2. Case-study is the most appropriate method for dealing with the psychological problems. Discuss.

OR

Describe the importance of experimental method in studying psychology with its limitations.

3. Discuss the process of conduct of nerve impulses with diagram.

OR

8. Define Regression Coefficient. State and prove its properties. 9

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1
which is compulsory

Group-A

1. Answer any *four* of the following : 6 × 4

   a) What do you mean by diagramatic representation of statistical data ? Explain the advantages of graphical and diagramatic representation.

   b) Name the different type of averages ? Explain the characterstics of a good average.

   c) Find mean and standard deviation of natural numbers 1, 2, 3.....n.

   d) Define Mean deviation and Standard deviation and write the difference in between them.

[2]

e) Show that for a discreate frequency distribution $\beta_2 > 1$.

f) The first three moments of a distribution about the value 2 are 1, 16 and –40 respectively. Examine the skewness of the distribution.

g) The variables X and Y are connected by the equation $ax + by + c = 0$. Show that correlation between them is –1 if the sign of a and b are all alike and +1 if they are different.

h) Define line of regression. Why two lines of regression? When two lines of regression will coincide.

Group-B

2. Explain the method of constructing Histogram and frequency polygon. Which out of these two is better representative of frequency of (i) a particular group (ii) Whole group. 9

3. Define Arithmetic Mean. State and Prove the properties of Arithmetic mean. What are the limitations of Arithmetic mean. 9

[3]

4. Define Standard deviation and Variance. Prove that Standard deviation is independent of change of origin but not scale. 9

5. Define moments. Establish the relationship between moments about mean in terms of moments about any point. 9

6. How do you define the term "The line of best fit". Give the normal equations generally used to obtain such a line. Fit a parabolic Curve to the following data relating to profits of a certain company 9

Year	1960	1962	1964	1966	1968
Profit in lakhs (₹)	125	140	165	195	230

7. Prove that Spearman's Rank correlation coefficient is given by 9

$$\rho = 1 - \frac{6 \sum di^2}{n(n^2 - 1)}$$

Where 'd' denotes the difference in ranks of an individual.

3. Derive 'IS' and 'LM' curves for an economy. 12½

4. Discuss in details the causes of inflation. 12½

5. 'Saving and Investment are related to the international flow of goods and capital'. Discuss. 12½

6. Account for the rapid growth of supply of money in India. 12½

7. Define the term unemployment. Discuss about natural, frictional and wait unemployment. 12½

8. Explain the determinants of residential and inventory investments. 12½

III-UG-Com(GE)-III (M.Eco)

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No 1 which is compulsory

Group-A

1. Write short notes on any *four* of the following: 7½×4

   a) Static Macro economic analysis.

   b) Social cost of inflation.

   c) Trade-off between inflation and unemployment.

   d) Muncell-Fleming model with fixed prices.

   e) Determinants of business fixed investment.

   f) Demand for money.

   g) Differential interest rates.

Group-B

2. What do you mean by circular flow of income in an economy ? What determines the magnitude of circular flow of income and expenditure ? 12½

b) Critically evaluate the role of branding and packaging in the marketing of products.   7

c) Define labelling. Discuss various types of labels.   7

3. a) How the Price Policy is determined ? Describe the methods of Price Policies adopted in determining the price of a new product. 5 + 8

OR

b) It is said that wholesaler is a Parasite and therefore a useless link in the chain of middlemen from manufacturer to consumer. Do you agree ? Discuss.   13

2016

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) "Marketing mix means the actual activities which are performed to achieve market targets and objectives of the firm"' Discuss and throw lights on the elements of marketing mix.   13

OR

b) What do you understand by marketing environment ? Discuss the different factors affecting marketing environment.   5 + 8

2. a) Discuss the stages in the product life cycle. What is significance of product life cycle in the marketing mix and in the product planning and development.   14

OR

c) There are 5 yellow, 4 green and 3 black balls in a bag. All the 12 balls are drawn one by one and arranged in a row. Find out the number of different arrangements possible.   6

b) Write short notes on the following :   6

   i) Lattices

   ii) Discrete Probability.

2016

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Why computer is called as Data processor. Draw and explain a block diagram to illustrate the basic organization of a computer system.   12

   OR

   b) Write short notes on the following :   12

      i)   Error Detection Codes

      ii) Floating Point Representation

      iv) History of Computers

      vi) Types of Data.

2. a) Convert the following numbers into their binary equivalent   12

   (i) $(352)_8$ (ii) $(A32)_{16}$ (iii) $(C74)_{16}$ (iv) $(698A)_{16}$

   OR

b) Write short notes on the following :   12

   i) 2's Complement form

   ii) Decoding BCD to Decimal

   iv) Encoding Decimal to BCD

   vi) Error Detecting Codes.

3. a) What is Virtual Memory ? Explain how program
        is executed by the help of virtual memory.   6

    b) What is a CACHE ? Why it is necessary ?
        Describe different mapping technique of
        CACHE.   6

                    OR

    c) How many types of storage are normally there
        in the storage unit of a computer system? Justify
        the need of each storage type. Differentiate
        between the characteristics of primary and
        secondary storage of a computer system.   12

4. a) WAP in assembly language to find out the
        greatest number among a set of given
        numbers.   6

b) Write short notes on the following :   6

   i) JK-Master Slave

   ii) Types of Logic Gates.

                    OR

    c) WAP in assembly language to find out the sum
        of two 8-bit numbers and result is 16-bit.   6

    d) Show how a NOR gate can be made into a NOT
        gate and how a NAND gate can be used as a
        NOT gate. Draw the logic gate for the following
        expression.
        $(A\overline{B} + B\overline{C} + \overline{A}C)$ 6

5. a) A question paper has two parts P and Q, each
        containing 10 questions. If a student needs to
        choose 8 from part P and 4 from part Q, in how
        many ways can he do that ?   6

    b) Compute the probability that the sum of the face
        values of the two dice is 8 when the dice are
        thrown simultaneously.   6

                    OR

b) Examine the functions and role of the World Bank as an engine of globalization.

3. Write short notes on any *one* of the following :   8

   a) Geography as an element/determinant of National Power.

   b) Concept of Spill-over

   c) Collective Security Provisions under the UN Charter.

□□

2016

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Explain the evaluation and development of International relations as a discipline. Do you think it as an autonomous discipline ? Justify your answer.   16

OR

   b) Discuss the basic assumptions of Realism and bring out the differences between Realism and Neo-Realism.

2. a) Critically examine the achievements of the SAARC as a regional organization. Delineate its basic problems.   16

OR

5. a) Explain translation, rotation and scaling procedures in two dimensional transformation. 8

OR

b) i) Write short notes on Homogeneous co-ordinates. 4

ii) Show how reflection in the line y = x and y = – x can be performed by a scaling operation followed by a rotation. 4

V-267-0.5 □□

2016

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Describe the characteristics and purpose of escape sequence characters. 4

b) State the differences between the declaration of a variable and the definition of a symbolic name. 4

OR

c) Write a short note on logical and Relational operators available in C. 4

d) Write a program to evaluate the roots of a given quadratic equation. 4

2. a) What is a conditional operator ? Write a program that will read the value of x and evaluate the following function

$y = 1$ for $x > 0$

$= 0$ for $x = 0$

$= -1$ for $x < 0$

using conditional operator. 4

[Turn Over

b) In what way a switch statement differ from an If statement. Explain with suitable example. 4

OR

c) Using while statement write a program to compute the sum of the digits of a given number. 4

d) Compare in terms of their functions the following pairs of statements 4

i) break and continue

ii) While and for.

3. a) Using array write a program to read *n* numbers and find their sum and average. 4

b) Distinguish between the following : 4

i) Actual and formal arguments.

ii) Automatic and static variables.

OR

c) Using function write a program that will read the values of two variables say x and y and print their interchange values. 4

d) Write the syntax of a two-dimensional array. Write a program that will read a 2-dimensional array and print it along with its transpose. 4

4. a) What is the difference between Structure and Union. Illustrate your answer with suitable example. 4

b) Write a program using pointers to read in an array of integers and print its elements in reverse order. 4

OR

c) Explain the difference between 'call by value' and call by reference. 4

d) Write a suitable program to show how a structure is defined and values are assigned to structure members. 4

[4]

b) Find the equation of the cone whose is the point (1, 2, 3) and whose guiding curve is given by the equation

$$x^2 + y^2 + z^2 - 4 = 0 = x + y + z - 1.$$

10. a) A tangent plane to the ellipsoid

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

meets the coordinate axes on the points A, B and C. Find the locus of the centroid of the triangle ABC.

OR

b) Find the equation of the generators of the hyperboloid of one sheet

$$\frac{x^4}{4} + \frac{y^2}{9} - \frac{z^2}{16} = 1$$

through the point $(2, -1, {}^4/_3)$.

2016

Full Marks - 80

Time - 3 hours

The questions are of equal value

Answer *all* questions

Symbols used have their usal meaning

1. a) Find all the asymptotes to the curve

$$x^3 + 4x^2y + 4xy^2 + 5x^2 + 15xy + 10y^2 - 2y + 1 = 0$$

OR

b) Find the radius of curvature of the curve

$$(x^2 + y^2)^2 = a^2(x^2 - y^2)$$

at the point where the tangent is parallel to x-axis as $\dfrac{\sqrt{2}\,a}{3}$.

2. a) Trace the curve $y^2(2a - x) = x^3$.

OR

b) Find the entire length of the curve

$$x^{2/3} + y^{2/3} = a^{2/3}$$

[2]

3. a) Find the area of the curve $r = a(1 - \cos\theta)$

OR

b) Find the area of the curve $r = a\sin 2\theta$.

4. a) Find the volume of the solid generated by revolving one arc of the cycloid $x = a(\theta + \sin\theta)$, $y = (1 + \cos\theta)$ about x-axis.

OR

b) Find the surface of the solid generated by revolving the arc of the parabola $y^2 = 4ax$ bounded by its latus rectum.

5. a) Solve :
$(2x\cos y + 3x^2y)dx + (x^3 - x^2\sin y - y)dy = 0$, $y(0) = 2$.

OR

b) Solve : $y + px = x^4p^2$

6. a) Solve : $\dfrac{dy}{dx} = \dfrac{y}{2x} + \dfrac{x^2}{2y}$

OR

[3]

b) Find the orthogonal trajectories of the family of curves

i) $r^2 = a\sin 2\theta$

ii) $y = x + ae^{-x}$

7. a) Solve : $(x^2D^2 + 4xD + 2)y = \sin x$.

OR

b) Solve by reducing to normal form
$y'' - 4xy' + (4x^2 - 1)y = -3e^{x^2}\sin 2x$

8. a) Find Laplace transform of

(i) $e^{-t}\cos^2 t$ (ii) $\cos h^2 at$.

OR

b) Solve using Laplace transform
$y'' + 3y' + 2y = t$, $y(0) = y'(0) = 0$.

9. a) A sphere of radius r passes through the origin and cuts the coordinate axes at A, B and C. Prove that the centroid of the triangle ABC lies on the sphere $x^2 + y^2 + z^2 = \dfrac{4r^2}{9}$.

OR

Group-B

2. Solve the following basic competitive model. 12½

   $Q_d = a - bp$

   $Q_S = -c + dp$, where

   Q_d = Quantity Demanded

   Q_S = Quantity supplied

   P = Price

   a, b, c and d are parameters.   12½

3. Discuss the different methods of measurement of Price elasticity of demand.   12½

4. Explain how the consumer makes optimum choice given the indifference map and the budget constraint.   12½

5. Discuss how the consumer makes optimal chioce between income and leisure and how the supply curve of labour is derived from income-leisure equilibrium.   12½

6. Discuss how a competitive firm takes output decision in short run and long run for maximising profit. 12½

7. Analyse the nature and shape of an input demand curve. Why does it shift upward and downward?   12½

8. What is an indifference curve? Explain its properties. 12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1 which is compulsory

Group-A

1. Answer any *four* of the following :   7½×4

   a) Discuss the importance of the study of Economics.

   b) Scarcity and choice are the fundamental aspects of the economic problems. Discuss.

   c) Write a note on opportunity set.

   d) Shifts in the supply curve.

   e) Consumer surplus.

   f) A long run AC curve is U-shaped but more flatter than short run AC curve.

   g) Marginal Physical Product and Marginal Revenue Product of Labour.

   h) Determinants of demand for labour.

g) Trace the growth of science and education in post-independence India.

h) Review the role of Media in Indian society.

Group-B

2. Discuss the main features of the Cabinet Mission Plan.   12½

3. Write an essay on the drafting of the Indian Constitution.   12½

4. Examine the role of Sardar Patel for the integration of Indian States.   12½

5. Narrate the role of India in the Non-Aligned Movement.   12½

6. Discuss the aims and objectives of the Five-Year Plans of Nehru period.   12½

7. Discuss the politics of Government of India for the development of science.   12½

8. Give a picture of Indian literature during Post-Independence era.   12½

2016

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *five* questions including Q.No1

which is compulsory

Group-A

1. Answer any *four* of the following :   7½×4

a) Briefly discuss the salient features of the Government of India Act 1935.

b) Write a brief note on the formation of the Constituent Assembly.

c) What is the Mountbatten Plan ?

d) Discuss the major issues in the working of Indian democracy.

e) Examine the measures adopted by the Government of India for the improvement of agriculture.

f) Discuss the condition of Indian industry and labour.

2. Write short notes on any *two* of the following :

4 × 2

a) Pay-Back period method.

b) Advantages and Disadvantages of Rate of Return method.

c) Profitability Index Method.

SECTION - B

1. a) Define Consumer Behaviour and state its scope and application. 12

OR

b) Describe in detail the nature and need of consumer behaviour in recent marketing scenario.

2. Write short notes on any *two* of the following :

4 × 2

a) Limited Decision Making

b) Extensive Decision Making

c) Organisational Buying Behaviour.

FIA-2017

Full Marks - 20

Time - 1 hour

The figures in the right-hand margin indicate marks

Answer *all* questions from any *one* Section

SECTION - A

1. a) What is Capital Budgeting ? What are the needs and importance of Capital Budgeting ? 12

OR

b) Raess Ltd. has currently under examinaton a project which will yield the following returns over the life of the project :

Year	1	2	3	4	5
Gross yield	80,000	80,000	90,000	90,000	83,000

Cost of machinery to be installed amounts to Rs.2,00,000 and the machine is to be depreciated at 20% pa at W.D.V basis. Tax rate is 50%. The salvage value of machine is zero. Calculate the net present value of the projects at a discount rate of 10%. (PV of money at rates of interest is as under).

Year	1	2	3	4	5
Gross yield	0.909	0.826	0.751	0.683	0.621

SECTION - B
(MR)

1. a) What do you mean by Market Research. Discuss different steps involved in a research process ?   12

OR

   b) Enumerate the various methods of collecting primary data.

2. Write short notes on any **two** of the following :

4×2

   a) Research Design

   b) Smapling

   c) Questionnaire.

FIA-2017

Full Marks - 20

Time - 1 hour

The figures in the right-hand margin indicate marks

Answer **all** questions from any **one** Section

SECTION - A
(FMS)

1. a) What do you mean by Financial System ? State the functions of financial system.   12

OR

   b) Define Money Market. Describe the importance of money market.

2. Write notes on any **two** of the following : 4×2

   a) Capital Market

   b) Primary Market

   c) Call Money Market

   d) Stock Exchange.