

V-UG-Zool(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any two of the following as per the instruction of the examiners : 9 × 2
 - a) To study the different types of fish diseases
 - b) Identify the different types of scales in fishes
 - c) Study of different types of fins of fishes
 - d) Study of different modified structures of fishes (Saw of Saw fishes, Hammer of hammer-headed fish, tail of Shark)
2. Practical Record 3
3. Viva-Voce 4

V-130-0.7



V-UG-Zool(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Conduct *two* of the following assignments as per the instructions given : 6 × 2
 - a) To study the developmental stages and Life Cycle of Drosophila from stock culture. 8
 - b) To study different types of placenta that are shown in photographs/charts.
 - c) To study the different development stages of chick embryo.
2. Identify with comments on the given spots I to IV.
(permanent slides of developmental stages of Frog and chick are to be supplied) 1½ × 4
3. Practical Record. 3
4. Viva-voce 4

V-100-0.7



V-UG-Zool(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *two* of the following as per the instruction of the examiners. 6 × 2
 - a) Study of DNA replication using photographs or slides and special cases, e.g. polytene chromosomes.
 - b) Estimation of RNA using orcinol reaction quantitatively using Calorimeter.
 - c) Preparation of Liquid/Solid culture medium and raise the culture of E.coli.
2. Prepare two models related to molecular biology as per the instruction. 3 × 2
3. Practical Record 3
4. Viva-Voce 4

V-110-0.7



V-UG-Zool(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. To study different types of parental care in animals that are shown in photographs/videos. 9

OR

To study behavioural response of wood-lice in response to humid condition.
 2. To study geotaxis behaviour in earthworm. 9

OR

To study phototaxis behaviour in insect larvae.
 3. Practical Record 3
 4. Viva-Voce 4
- V-120-0.7 □□

6. Viva.	6
7. Record.	4

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Solve any *one* with Scilab programme***Distribution of Marks***

Experiment	15
Viva	06
Recod	04

1. Solve the S-wave Schrodinger equation for the ground state of the hydrogen atom for free particle. 15
2. Solve the S-wave Schrodinger equation for the first excited state of the hydrogen atom. 15
3. Solve the S-wave radial Schrodinger equation for the screened coulomb potential. 15
4. Plot the Gaussian wavefunction by taking appropriate limit. 15
5. Solve and plot the equation. 15

V-97-0.6



$$\frac{dv}{dt} = g - av \quad v(0) = 0 \quad g = 9.8\text{m/s}^2$$

$$t(0) = 0 \quad a = 0.2\text{s}^{-1}$$

V-97-0.6

[Turn Over

[2]

- f) Calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte.
- g) Study the effect of light on seed germination.
- h) Study the induction of amylase activity in germinating barleygrains.
2. Demonstration experiments (any **one**) : 6
- a) To demonstrate suction due to transpiration
- b) Avena coleoptile bioassay
- c) Rooting for cuttings.
3. Viva-voce 5
4. Class Record 2



V-UG-Bot(CC)-XII (Pr)

2018

Full Marks - 25

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 : 12
- a) Determine the O.P of the cell-sap of the given plant material by plasmolytic method.
- b) Determine the D.P.D of given tissue by weight method.
- c) Study the effect of wind velocity on the rate of transpiration in excised twig
- d) Study the effect of light on the rate of transpiration in excised twig
- e) Calculate the stomatal index and stomatal frequency from the two surfaces of leaves of dorsiventral and isobilated leaves.

V-UG-Bot(DSE)-II(Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Study the different techniques of hybridization found in bisexual plants. 12

OR

- b) Study the polygenic inheritance of wheat Kernel colour. Give the phenotype ratio for the cross between a wheat plant which is homozygous dominant for both the genes and one which is heterozygous for both the genes. 6 + 6

2. Draw labelled diagrams and identify with reasons of the materials given-A, B and C. 6

3. Viva-Voce 5

4. Class-Record 2

V-129-0.6



V-UG-Bot(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Test the viability of supplied specimen 'A' by tetrazolium. 7

2. Perform any *one* of the following chosen by lot 7

a) Study the development of supplied embryo

b) Study the supplied female gametophyte

c) Calculate the percentage of germination of pollen by hanging drop method

d) Intraovarian pollination.

3. Draw labelled diagrams of supplied microslides or photographs on the spot and identify with comments. Specimen-B, C, D. 2 × 3

4. Viva 4

5. Class Record. 2

V-99-0.6



V-UG-Chem(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the Saponification value of coconut oil. 15

OR

Determine the iodine number of coconut oil.

OR

Estimate the amount of amino acid by Sorenson's fermal in method.

2. Viva-voce 6
3. Record. 4

V-98-0.6



V-UG-Chem(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Verify Lambert-Beer's law and determine the concentration of CuSO_4 in a solution of unknown concentration. 15

OR

Verify Lambert-Beer's law and determine the concentration of KMnO_4 in a solution of unknown concentration.

OR

Determine the λ_{max} value of KMnO_4 (0.1M) in 200-500nm absorption spectra.

OR

Study the pH-dependence of the UV-VIS spectrum (200-500) of $\text{K}_2\text{Cr}_2\text{O}_7$.

OR

determine the λ_{max} value of the UV-VIS spectrum of $\text{K}_2\text{Cr}_2\text{O}_7$ (0.1M).

2. Viva-Voce 6
3. Record 4

V-108-0.6



V-UG-Phy(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

Perform any *one* of the experiment

1. Determine the susceptibility of paramagnetic solution by Quinck's Tube Method.
2. Study the PE Hysteresis loop of a Ferroelectric crystal.
3. Determine the resistivity of a given semiconductor with temperature by four probe method and determine the band gap.
4. To determine Hall coefficient of the given semiconductor sample.
5. To determine the refractive index of a dielectric layer using SPR.

Distribution of marks

Experiment	15
Viva	06
Record	04

V-UG-Chem(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Synthesize acrylonitrile by precipitation polymerization. 15
OR
Synthesize Polymethyl Methacrylate.
OR
Synthesize Acrylamide by Redox Polymerization.
OR
Prepare phenol-formaldehyde resin.
OR
Prepare Urea-formaldehyde resin.
2. Viva-Voce 6
3. Record 4

V-UG-Bot(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Estimate the solid waste (biodegradable and non-biodegradable) generated by a domestic system and write its important on land degradation. 8

OR

- b) Measure the dominance of woody species by DBH method.

2. Submit any ecological model prepared by you. 7

3. Viva-Voce 7

4. Practical Records 3

V-119-0.6



V-UG-Chem(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Estimate the amount of dissolved oxygen in a given sample of water. 10

OR

Determine the amount of chlorine present in the sample of bleaching powder.

OR

Determine the total alkalinity present in a given water sample.

2. Prepare and submit 2gms of borax/boric acid. 5

3. Viva-Voce 6

4. Record 4

V-128-0.6



6. Write a C++ program to add two matrices using two dimensional array. 5
7. Record. 4
8. Viva-Voce. 6

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer any *three* questions

1. Write a C++ program to calculate the sum $\frac{1}{1} + \frac{1}{2} + \dots + \frac{1}{N}$ for a given N. 5
2. Write a C++ program that prompts the user to input any natural number and calculate its factorial. 5
3. Write a C++ program that prompts the user to input 5 decimal numbers and prints the sum and average. 5
4. Write a C++ program that prompts the user to enter the length of three sides of a triangle and outputs a message indicating whether the triangle is right triangle or a scalene triangle. 5
5. Write a C++ program to enter 100 integers into an array and sort them in descending order and print the smallest integer. 5

V-123-0.5



5. Write a value returning function to determine the smallest number from a set of numbers. Use this function to determine the smallest number from a set of 10 numbers. 5
6. Write a program to enter 10 integer into an array and sort them in ascending order and print it. 5

Record 4

Viva-Voce 6

V-32-0.5



2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer any *three* questions

1. Calculate the sum of the series $1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$ for any positive integer N. 5
2. Write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number or not. 5
3. Write a program that prompts the user to input the value of a, b, and c involved in the equation $ax^2 + bx + c = 0$ and outputs the type of the roots of the equation. Also the program should output all the roots of the equation. 5
4. Write a program that generates random integer between 0 and 99. Given that first two Fibonacci numbers are 0 and 1. Generate all Fibonacci numbers less than or equal to generated number. 5

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw UML Use Case diagram for the following problem. 5
 - a) Consider a library, where a member can perform two operations : issue book and return it. A book is issued to a member only after verifying his credentials.

OR

- b) Consider your neighboring travel agent from whom you can purchase flight tickets and book a hotel. To book a ticket you need to provide details about your journey i.e your address, on which date and at what time you would like to travel. You can pay by cash or by credit card. You can also cancel a booked ticket and hotel booking. Appropriate refund as per policy is made in case of cancellation.

[2]

2. Draw UML Class Diagram for the following problem. 5

- a) Consider an Online Shopping, where each customer has unique id and is linked to exactly one account. Account owns shopping cart and orders. Customer could register as a web user to be able to buy items online. Web user has login name which also serves as unique id. Web user could be in several states-new, active, temporary blocked, and be linked to shopping cart. Shopping Cart belongs to account.

OR

b) *Draw a UML Activity Diagram for the following :*

Consider an Online Shopping, where each customer can browse or search items, view specific item, add it to shopping cart, view and update shopping cart, checkout. User can view shopping cart at any time. Checkout is assumed to include user registration and login.

[3]

3. *Draw a UML Use Case diagram for the following : 5*

- a) Consider a Hospital Management System. Where the receptionist schedules patient's appointments and admission to the hospital, collects information from patient upon patient's arrival and/or by phone. For the patient that will stay in the hospital ("inpatient") she or he should have a bed allotted in a ward. Receptionists might also receive patient's payment, record them in a database and provide receipts, file insurance claims and medical reports.

OR

- b) Consider an automated teller machine (ATM) that provides bank customers with access to financial transactions in a public space without the need for a cashier, clerk, or bank teller. Customer (actor) uses bank ATM to check Balances of his/her bank accounts, Deposit Funds, Withdraw Cash and/or Transfer Funds (use cases). ATM Technician provides Maintenance and Repairs.

4. Record and Attendance 4

5. Viva-Voce 6

V-UG-Edn(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is case study ? Write a report about the academic performance of an educational institution through case study. 10

OR

Prepare a quationnaire for conducting a case study for an educational institution.

2. Record. 10
3. Viva-Voce. 5

V-UG-C.Sc(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer any *three* questions

1. Write a JSP program to find the sum of two numbers passed as parameter from HTML file. 5
2. Write a JAVA program using Servlet and JDBC to display all the rows of a EMP table (Empno, Ename and Salary). 5
3. Write a JAVA program using JDBC to insert a new row in to EMP table (Empno, Ename and Salary) and update salary of the emplyee whose empno is 7369. 5
4. Write a Java Script program to check whether a number is prime number. 5
5. Record. 4
6. Viva-voce 6

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

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Solve the problem related to Ground water. 3
(To be given at the time of Exam).

OR

- b) Solve the ground water problem. 3

2. Identify the building stones and mention their uses.(B₁ – B₄) 12

3. Lab. Record 3

4. Viva-voce 4

V-102-0.5



V-UG-Edn(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare a term paper on the comparing the primary education system of USA with UK. 10

OR

Choose any topic of your interest of comparative education and prepare a report.

2. Record 10

3. Viva-voce 5

V-105-0.5



V-UG-C.Sc(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write a C or C++ program to encrypt and decrypt a string by Ceaser Cipher Technique. 15

OR

Write a C or C++ program to encrypt and decrypt a string by Transposition Cipher Technique.

2. Record 4
3. Viva-Voce 6

V-121-0.5



V-UG-Edn(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write down the procedures of searching Internet for collecting study material. 10

OR

Write a report on any topic you like through the procedure of Internet searching.

2. Record 10
3. Viva-Voce 5

V-115-0.5



V-UG-Geol(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Solve the Ore Reserve Estimation problem. 6
(To be given at the time of exam).
2. Solve the mining and drilling problem. 6
(To be given at the time of exam)
3. Solve the bore hole logging problem. 6
(To be given at the time of exam)
4. Lab-Record 3
5. Viva-Voce 4

V-132-0.5



V-UG-Geol(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the given Ores under microscope. (S_1-S_5). 3×5
2. Solve the problem. 3
3. Lab-Record 3
4. Viva-Voce 4

V-112-0.5



V-UG-C.Sc(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

*Perform the following Operation using
Microprocessor kit*

1. Add two Binary numbers each of 8 bytes long. 5
2. Find the maximum number in a given string (16 bytes long) and store it in location 0310. 5
3. A data string of number of bytes (to be specified in CX reg) is located from the starting address 0300. Convert this data string to its 2's complement and store the result from 0400 onwards. 5
4. Add two 16 bit no. Write the steps to insert and execute a program in M86-01 Trainer kit. 5
5. Record and attendance 4
6. Viva-Voce 6

V-UG-Edn(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is case study ? How to conduct a case study for an exceptional child (procedure of case study). 10

OR

Write down the procedure of case study for an exceptional child.

2. Record 10
3. Viva-Voce 5

V-UG-Geol(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Plot availability of coal in map of India. 5
- b) In an outline map of India show occurrences of radioactive minerals. 5
- c) Show petroliferous basins of India in map. 5
2. Distinguish Gondwana Coal Vs Tertiary Coal. 3
3. Lab. record 3
4. Viva-Voce 4



V-UG-Psy(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the basic leadership style of 6 college students (3 boys and 3 girls) using Greenberg Basic Leadership style scale and find out the gender difference. 12

OR

Measure the conflict handling style of 6 college students by using Rahim's scale and observe the gender difference. 12

2. Record. 5
3. Viva 8



V-UG-Geog(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a map showing the physical division of India ? 6
2. Deaw a map of India showing the National Highways. 6
3. Draw a population distrubution map of India. 8
4. Practical Record. 2
5. Viva-Voce. 3

V-94-0.4



V-UG-Psy(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Locate the areas of emotional difficulties of your subject by administering Jung/Kent Rosanoff list of Word Association Test (WAT). 12

OR

Assess the personality of yourself by administering the Rorschach's Ink Blot Test and give a summary report. 12

2. Record 5
3. Viva 8

V-116-0.4



V-UG-Psy(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the sleep quality of 4 college students by using the Pittsburgh Sleep Quality Index (PSQI). 12

OR

Measure the engagement coping strategies of 4 college students and find out the gender difference using Tobin's coping strategy Inventory. 12

2. a) Record 5
b) Viva 8

V-UG-Geog(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Show important interpretation keys used for visual interpretation of satellite imageries. 6
2. Interpret supplied Aerial photograph. 6
3. Briefly explain GPS system with its application. 8
4. Practical Record 2
5. Viva-Voce 3

V-UG-Geog(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a Map showing the distribution of Bauxite in Odisha. 6
2. Prepare a map showing Natural Vegetation types of Odisha. 6
3. Prepare a choropleth map showing the density distribution of population of Odisha. 8
(Data to be supplied)
4. Practical Record 2
5. Viva-Voce 3

V-UG-Psy(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the quality of life in 2 nuclear 2 joint families using 'The Beach Center Family Quality of life scale'. 12

OR

Assess the community integration of a village by using community integration questionnaire (CIQ) of Barry Willer. 12

2. a) Record 5
- b) Viva 8

V-UG-Geog(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a Map showing the distribution of Bauxite in Odisha. 6
2. Prepare a map showing Natural Vegetation types of Odisha. 6
3. Prepare a choropleth map showing the density distribution of population of Odisha. 8
(Data to be supplied)
4. Practical Record 2
5. Viva-Voce 3

V-UG-Psy(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the quality of life in 2 nuclear 2 joint families using 'The Beach Center Family Quality of life scale'. 12

OR

Assess the community integration of a village by using community integration questionnaire (CIQ) of Barry Willer. 12

2. a) Record 5
- b) Viva 8

V-UG-Anth(DSE)-I (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Do a step test of your subject according to the prescribed procedure and find out the index. 10
2. Take the pulse rate (manually) of your subjects. What does it indicate? 5
3. Record 5
4. Viva 5

V-113-0.3



V-UG-Anth(CC)-XI (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is a handaxe. What are the different varieties of handaxe. 10

OR

What are blade tools. Narrate different blade tools and uses.

2. Write any *one* of the following : 5
 - a) Levalloisean technique
 - b) Grinding and polishing technique.
3. Record. 5
4. Viva. 5

V-93-0.3



V-UG-Anth(CC)-XII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Describe different types of NGOs and its functions. 5

OR

- b) Write down the Handicraft designing. How rural people are promoting the Handicrafts to the market. 5

2. Student interaction and seminar with NGOs. 10

3. Lab. Record 5

4. Viva-voce 5

V-103-0.3



V-UG-Anth(DSE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is case study ? What are the methods and techniques used in the case study. 7½

2. Write down any one of the following case study of social institute with respect to culture perspective.

- a) Religion 7½

- b) Economic

- c) Political.

3. Record 5

4. Viva-Voce 5

V-124-0.3



V-UG-Geog(DSE)-II (Pr)

2017

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a Map showing the distribution of Bauxite mines in Odisha. 6
2. Prepare a map showing different soil types of Odisha. 6
3. Prepare a choropleth map showing the density distribution of population of Odisha. 8
(Data to be supplied)
4. Practical Record 2
5. Viva-Voce 3



V-UG-Geog(DSE)-II (Pr)

2017

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a Map showing the distribution of Bauxite mines in Odisha. 6
2. Prepare a map showing different soil types of Odisha. 6
3. Prepare a choropleth map showing the density distribution of population of Odisha. 8
(Data to be supplied)
4. Practical Record 2
5. Viva-Voce 3



- ଗ) ଜୀବନ ମୃତ୍ୟୁର ଏହା ତ ଚିରନ୍ତନ ଲୀଳା; ସମସ୍ତେ କର୍ମଫଳର ଅଧିକାରୀ ।
- ଘ) ଏମିତି ଆହୁରି କିଛି ସନ୍ତାନ ଜନ୍ମ ଦେବାର ପାପରୁ ମୋତେ ଉଦ୍ଧାର କରନ୍ତୁ ତାହାରବାରୁ !

୪. ଯେ କୌଣସି **ଚାରେଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଲେଖ : 9 × ୪

- କ) ‘ଠିକ୍ ତମରି ଆବାସ ଆଗରେ ମୋ ଗାଡ଼ି ଅଟଳ ହେଲା ?’ - ଏ କଥା କିଏ କାହାକୁ କହିଛନ୍ତି ?
- ଖ) ରକ୍ତାକ୍ତ ଲୁଗା ନେଇ କିଏ ରାଣୀଙ୍କ ନିକଟକୁ ଯାଇଥିଲେ ?
- ଗ) ‘ବୁଢ଼ାକୁ ଛାଡ଼ି ସେ ବର୍ତ୍ତମାନ ଆଦରି ନେଇଥିଲା ଗୋଟାଏ ବୁଢ଼ୀକୁ’ - କିଏ ?
- ଘ) ହେ ଖୋଦା ! ମତେ ଆହାର ଦିଅ - ମତେ ପାଣି ଦିଅ - ନଚେତ୍ ମୋର ଜୀବନ ଅବି ଅବି ଉଡ଼ିଯିବ - ଏ କଥା କିଏ କହିଛି ?
- ଙ) କିଏ ଦୁଇ ଆଖିରେ ଅନ୍ଧ ପକ୍ଷିକାର ଆବରଣ ପିନ୍ଧିଥିଲେ ?
- ଚ) ପାପୁଲିରେ ଦଳୁଥିବା ମଇଳା କାଗଜ ପୁଲରେ କ’ଣ ଲେଖାଥିଲା ?
- ଛ) ବିନା ପଣା କାହାକୁ ଦୋକାନ ଭିତରୁ ଘୋଷାରି ଆଣି ଛୁରୀ ଭୁଷି ଦେଲା ?
- ଜ) ସୁନୟାଦେବୀଙ୍କ ତିନିଝିଅଙ୍କର ନାମ ଉଲ୍ଲେଖ କର ।

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

୧. ‘ଅମୃତଫଳ’ରେ ପ୍ରତିଫଳିତ ଭର୍ତ୍ତୃହରିଙ୍କ ଚରିତ୍ର ଚିତ୍ରଣ କର । ୧୨
ଅଥବା
‘ନର-କିନ୍ନର’ ଉପନ୍ୟାସରେ ଥିବା ଚରିତ୍ରମାନଙ୍କର ବୈଶିଷ୍ଟ୍ୟ ପ୍ରକାଶ କର ।
୨. ସବୁ ସଂପର୍କର ଉର୍ଦ୍ଧ୍ୱରେ ‘ରାଜନୀତି’ - ‘ଶ୍ରୀକୃଷ୍ଣଙ୍କ ଶେଷହସ’ ଗନ୍ଧ ଅବଲମ୍ବନରେ ଆଲୋଚନା କର । ୧୨
ଅଥବା
‘ବନ୍ଧ୍ୟା ଗାନ୍ଧାରୀ’ ଗନ୍ଧର ସାମାଜିକ ଆବେଦନ ଉଲ୍ଲେଖ କର ।
୩. ଯେ କୌଣସି **ଦୁଇଟିର** ସପ୍ତସଙ୍କ ବ୍ୟାଖ୍ୟା ଲେଖ : ୪ + ୪
କ) ଅଶ୍ୱକୁ ପଥଭ୍ରଷ୍ଟ ହେବାରୁ ନିବୃତ୍ତ କରିବାକୁ ହେଲେ ଯେମିତି ଲଗାମ ଭିଡ଼ିବାକୁ ହୁଏ, ନିଜ ଦୃଷ୍ଟିକୁ ଆୟତ୍ତରେ ରଖିବା ନିମନ୍ତେ ତାହାଠୁ ଅଧିକ କଷ୍ଟ କରିବାକୁ ପଡ଼ୁଥିଲା ।
ଖ) ଏ ସଂସାର ମଉନମୁହାଁ, ପୋତାମୁହାଁଙ୍କ ପାଇଁ କ୍ଷୁଦ୍ର ! ଏ ସଂସାର ମୁହଁ ଆଉ ପାଟିର ସଂସାର !

3. Write short notes on any **one** of the following : 8

- a) Cooperative federalism
- b) Emerging trends in Indian Party System.
- c) Types of pressure groups in India
- d) Coalition Politics.

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. Critically examine the development of the basic structure of the Constitution of India. 16

OR

Account for the growth of Regionalism in India.

2. Examine the social base and ideology of major national political parties in India. 16

OR

Discuss the nature of defection in Indian Politics.

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Assuming Lennard Jones potential calculate binding energy and bulk modulus of inert gas crystal. 4 + 5
- b) Discuss hydrogen binding in crystals. 3

OR

- c) Obtain the dispersion relation for elastic waves in a linear mono-atomic lattice and show that the group velocity vanishes at zone boundary. 6 + 2
 - d) Discuss local phonon modes. 4
2. a) Discuss anharmonic crystal interaction and derive an expression for the coefficient of thermal expansion. 1 + 5

[2]

- b) Calculate the density of states for electrons in one dimensional system. Using the above formula calculate the total number of electrons N and the total energy of the system. Show that

$$E_0 = \frac{1}{3} N \epsilon_F$$

where ϵ_F is the Fermi energy. 6 + 4

OR

- c) Discuss Kronig-Penny model for a linear lattice. How does it lead to formulate energy bands in solids. 9 + 3
- d) State and explain Bloch's theorem. 4
3. a) Show that for a semiconductor the product of electron and hole concentration is a constant at a given temperature. 8
- b) Distinguish between intrinsic and extrinsic semiconductors. Locate their Fermi levels. 4

OR

[3]

- c) From thermodynamical consideration show that the entropy is always greater in the normal state than in the superconducting state. 6
- d) Derive an expression for the magnetic flux in a superconducting ring. Explain why the flux is quantised. 6

V-140-0.3



- c) An arborescence is a tree in which every vertex other than the root has an in degree of exactly one. 4
- d) Prove that every acyclic digraph G has at least one vertex with zero in degree and at least one vertex with zero out degree. 4

V-141-0.5

**2018**

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Show that the maximum number of edges in a simple graph with n vertices is $\frac{n(n-1)}{2}$. 4
- b) Prove that a connected graph G is an Euler graph iff all vertices of G are of even degree. 4

OR

- c) Prove that if a connected graph G is decomposed into two subgraphs g_1 and g_2 then there must be at least one vertex common between g_1 and g_2 . 4
- d) Prove that a simple graph with n vertices must be connected if it has more than

$$\frac{(n-1)(n-2)}{2} \text{ edges.} \quad 4$$

[2]

2. a) Prove that a graph is a tree iff it is minimally connected. 4
- b) Prove that any circuit in a graph G must have at least one edge in common with a chord set. 4

OR

- c) Prove that in any tree (with two or more vertices), there are at least two pendant vertices. 4
- d) Prove that every circuit has an even number of edges in common with any cut set. 4
3. a) Prove that the complete graph of five vertices is non-planar. 4
- b) Prove that a graph has a dual iff it is planar. 4

OR

- c) Prove that G is a planar graph, then prove that $X(G) \leq 5$. 4
- d) Prove that $K_{3,3}$ has no dual. 4

[3]

4. a) If $A(G)$ is an incidence matrix of a connected graph G with n vertices, then prove that the rank of $A(G)$ is $n - 1$. 4
- b) If B is a circuit matrix of a connected graph G with e edges and n vertices, then show that rank of $B = e - n + 1$. 4

OR

- c) Prove that the reduced incidence matrix of a tree is nonsingular. 4
- d) Show that for a simple disconnected graph of K components, n vertices and e edges the rank of matrix $B = n - K$. 4
5. a) Prove that every tree with two or more vertices is 2-chromatic. 4
- b) Prove that the chromatic number of a graph will not exceed by more than one the maximum degree of the vertices in a graph. 4

OR

3. Explain the kinds of Excise Duties. Briefly explain what are the Basic conditions for Central Excise duty liability. 13

OR

- a) What is Value Added Tax ? Explain the different features of Value Added Tax. 6
- b) What is CENVAT ? State the conditions for availing of credit under CENVAT. 7

V-142-0.8

**2018**

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. P and Q are Working Partners in a professional firm of Chartered Accountants. The firm is assessed U/S 184 of Income Tax Act.

*Profit and Loss A/c
for the year ending 31.3.2018*

<i>Particulars</i>	<i>Amount (Rs.)</i>	<i>Particulars</i>	<i>Amount (Rs.)</i>
General Expenses	28,00,000	Professional receipts	75,00,000
Salaries to Staff	5,00,000	Refund of Service Tax	2,00,000
Salary to P	15,00,000	STCG on Shares U/S 111A	2,00,000
Salary to Q	10,00,000	Rent of House property	6,00,000
Interest on Capital @ 16% p.a.			
P 18,000			
Q <u>15,000</u>	33,000		

V-142

[Turn Over

[2]

Service tax paid	2,00,000	
Donation to Red Cross Society (Not fixed u/s 80 G)	77,000	
Net profit C/d	23,90,000	
	85,00,000	85,00,000

Additional Information :

- i) General Expenses include expenses of Rs.200,000 on installing camera security system with LCD.
- ii) Service tax of Rs.20,000 was paid on 30.11.2018. Due of filing return of income 30.9.2018.
- iii) Q withdrew Rs.1,40,000 on 1.10.2017 from firm for purchasing a Nano car for his personal use.
- iv) Salary and Interest to partners have been paid as per deed.
- v) Deed also requires partners to pay interest @ 10% p.a. on drawings made by them, if any.

[3]

Calculate :

A : Total income and Tax liability of firm.

B : Business Income of Partners. 14

OR

- a) Distinguish between a firm assessed U/S 184 and a firm assessed U/S 185. 7
- b) Define an AOP. What are the steps regarding computation of total income of AOP ? 7

2. a) What is Tax avoidance ? Distinguish between Tax avoidance and Tax evasion. 6
- b) What is Tax Planning ? Explain it with reference to financial management decisions. 7

OR

Distinguish between Amalgamation and Demerger. Briefly explain the Tax Planning in respect of amalgamation of companies. 13

୯) ଗାଥା କବିତା କହିଲେ କ'ଣ ବୁଝ ? ଗଡ଼ନାୟକ ଜଣେ ସଫଳ ଗାଥା କବି ଥିଲେ କି ? ପଠିତ କବିତାକୁ ଆଧାର କରି ଏହାର ସତ୍ୟତା ନିରୂପଣ କର ।

୨. ମହାଭାରତର 'ସ୍ଵର୍ଗାରୋହଣ ପର୍ବ' ଆଧାରରେ କବିଙ୍କ କାବ୍ୟ-ବୋଧ ଓ କାବ୍ୟ ସଂଗଠନରେ କାଳ ଏବଂ ଜୀବନର ବିଚାର କିପରି କରାଯାଇଛି, ତାହା ଆଲୋଚନା କର । ୧୨.୫

୩. 'ଉପେନ୍ଦ୍ରଙ୍କ ଅନ୍ୟ କାବ୍ୟ ତୁଳନାରେ 'ପ୍ରେମ ସୁଧାନିଧି' କାବ୍ୟର ଭାଷା ଅଧିକ ସରଳ, ସାଧାରଣ ଏବଂ ହୃଦୟଗ୍ରାହୀ - ଉକ୍ତ ଉକ୍ତିର ସାରବତୀ ପ୍ରେମ ସୁଧାନିଧି କାବ୍ୟର ପଠିତାଂଶକୁ ଉଦାହରଣ ଭାବେ ନେଇ ବିଚାର କର । ୧୨.୫

୪. 'ମନବୋଧ ଚଉତିଶା'ର ଗଠନ ପ୍ରକ୍ରିୟାରେ କବିଙ୍କର ଆବେଗ କିପରି ଜୀବନ-ଦର୍ଶନ ସମ୍ବନ୍ଧିତ ହୋଇଛି, ତାହା ଆଲୋଚନା କର । ୧୨.୫

୫. 'ମାଧବୀ ଦାସୀଙ୍କ ରଚିତ 'ଚକାନୟନ ହେ' ଏକ ପ୍ରାର୍ଥନା' - ଏହାକୁ ଯୁକ୍ତି ସଂଗତ ଭାବେ ଖଣ୍ଡନ ବା ମଣ୍ଡନ କର । ୧୨.୫

୬. 'ପ୍ରଭାତ ଅବକାଶ' କବିତାରୁ କବିଙ୍କ ପ୍ରକୃତି ପ୍ରାଣତା ତଥା ଭାବାନୁଭୂତିର ପରିଚୟ ସଦୃଶୀ ପ୍ରଦାନ କର । ୧୨.୫

୭. ଓଡ଼ିଆ ଗାଥା କବିତା ବିକାଶ କ୍ରମରେ ରାଧାନୋହନ ଗଡ଼ନାୟକଙ୍କ 'ପଶୁପକ୍ଷୀର କାବ୍ୟ' କେତେ ସଫଳ ହୋଇଛି, ତାହା ବିଚାର କର । ୧୨.୫

୮. 'କଞ୍ଚୁକୀର ଭାବନା' କବିତା ଅବଲମ୍ବନରେ କଞ୍ଚୁକୀ ସାରାରାତି କେଉଁ କେଉଁ କଥା ଭାବିଛି, ତାହା ଉଲ୍ଲେଖ କର ।

2018

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

୧. ଯେ କୌଣସି **ଚାରୋଟି** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ପ୍ରଦାନ କର : ୨.୫ × ୪

କ) 'ସ୍ଵର୍ଗାରୋହଣ' ପର୍ବ ଆଧାରରେ କଳି ପ୍ରବେଶର ଚିତ୍ର କିପରି ଭୟାବହ ହୋଇଛି, ତାହା ଉଲ୍ଲେଖ କର ।

ଖ) ପ୍ରେମ ସୁଧାନିଧି କାବ୍ୟର ୧୪ଶ ଛାନ୍ଦର ବିଷୟବସ୍ତୁକୁ ନିଜ ଭାଷାରେ ଲେଖ ।

ଗ) 'ମନବୋଧ ଚଉତିଶା'ରେ ସଂସାରର ଅସାରଣ କିପରି ପ୍ରତିପାଦିତ ହୋଇଛି, ତାହା ଉଲ୍ଲେଖ କର ।

ଘ) ଓଡ଼ିଆ କୋଇଲି ସାହିତ୍ୟରେ 'ବାରମାସୀ କୋଇଲି'ର ଅନ୍ୟତା ପ୍ରତିପାଦନ କର ।

ଙ) 'କଞ୍ଚୁକୀର ଭାବନା' କବିତାରୁ କବିଙ୍କ ଦାର୍ଶନିକ ମନୋଭାବର ପରିଚୟ ପ୍ରଦାନ କର ।

ଚ) 'ଯାତ୍ରାସଙ୍ଗୀତ' କବିତାରୁ କବିଙ୍କର ରସସ୍ୟାହୁନ ଚିନ୍ତାଧାରାର ପରିଚୟ ପ୍ରଦାନ କର ।

ଛ) 'ସମୁଦ୍ର ଓ ମୁଁ' କବିତାରୁ କବିଙ୍କ ଦୃଷ୍ଟିକୋଣର ପରିଚୟ ଦିଅ ।

ଜ) 'ବନ୍ଦୀର ସାକ୍ଷ୍ୟ ଅନୁଚିନ୍ତା' କବିତାର ସାରକଥା ଲେଖ ।

- | | |
|---|-----|
| 2. राजगृहस्य निर्माण विधिं वर्णयत । | 12½ |
| 3. वृक्ष छेदनस्य कारणानि तस्य कुप्रभावः वर्णयत । | 12½ |
| 4. वृक्ष आर्युवेदस्य महत्वं वर्णयत । | 12½ |
| 5. वृक्षाणां रोपण कालं च रोपण विधिं वर्णयत । | 12½ |
| 6. वृक्षाणां रोगं निरूप्य तस्य उपचार विधिं वर्णयत । | 12½ |
| 7. परिवेषे विविध वृक्षाणां महत्वं वर्णयत । | 12½ |
| 8. सेनापति गृहनिर्माण विधिं वर्णयत । | 12½ |
| 9. नन्यावर्त वास्तु तथा वर्धमान वास्तु लक्षणं वर्णयत च उपयोगितां वर्णयत । | 12½ |

V-63-0.6

**2018**

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

1. अधोलिखितेषु **चतुर्णां** प्रश्नानाम् उत्तरं लिखत : $7\frac{1}{2} \times 4$
- क) वास्तुपुरुषः कः ? तस्य स्वरूपं वर्णयत ।
- ख) वास्तुविद्यायाः महत्वं वराहमिहिरदिशा वर्णयत ।
- ग) वराहमिहिरस्य परिचयं प्रकटयत ।
- घ) गृहे स्तम्भानां महत्वं वर्णयत ।
- ङ) 'नन्दथावर्त' वास्तु लक्षणं वर्णयत ।
- च) के काण्डरीत्याः वृक्षाः ।
- छ) वृक्षाणां रोपण कालं वर्णयत ।
- ज) वीजानां रोपण विधिः किदृशीस्यात् ।
- झ) वृक्षाणां सेचन विधि वर्णयत ।

2. Describe the economical and ecological approaches of sustainable utilization. 9
3. What do you mean by Biodiversity ? Discuss its types and significance. 9
4. Describe the major and minor forest products. Write the management strategies of forest. 9
5. Describe the uses of alternate energy sources. 9
6. Discuss about the solid waste management. 9
7. Describe briefly the different resource management and conservation. 9
8. What is the difference between renewable and non-renewable energy ? Describe the different non-renewable sources of energy. 9
9. Describe the depletion and management of forest. 9

2018

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

1. Write notes on any **four** of the following : 6 × 4
 - a) Types of Natural Resources
 - b) Soil degradation
 - c) Threats to Biodiversity
 - d) National Biodiversity Action Plan
 - e) Threats and Management strategies of ground water.
 - f) Liquid Waste Management
 - g) National efforts for the conservation of Biodiversity.
 - h) Threats and Management strategies of marine.

2018

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

1. Answer any *four* of the following :
 - a) How are the polymers classified on the basis of
 - i) their occurrence
 - ii) their linear structure
 - iii) their end use ? 2+2+2
 - b) Give an account of copolymers and types of copolymers. 6
 - c) Explain the molecular forces and chemical bonding in polymers. 6
 - d) Discuss the factors affecting crystalline melting point of polymers. 6

[2]

- e) Discuss the structure-property relationships in polymers. 6
- f) Describe the polymerisation technique. 6
- g) Give an account of morphology of crystalline polymers. 6
- h) Write notes on the following : 3+3
- i) Conducting polymers
 - ii) Polyacetylene.
2. Write notes on the following : 3+3+3
- i) Texture of Polymers
 - ii) Free Volume Theory
 - iii) WLF equation.
3. Explain the kinetics and mechanism of co-ordination polymerisation. 9
4. Discuss :
- i) Criteria for solubility of polymers 4
 - ii) Thermodynamics of polymer solutions. 5

[3]

5. Describe how molecular weight of a polymer is determined by osmotic pressure method. 9
6. Write notes on the following :
- i) End group analysis 4
 - ii) Lower and upper critical solution temperatures. 5
7. Discuss the physical, thermal and mechanical properties of polymers. 9
8. Write notes on the following :
- i) Conducting polymers 5
 - ii) Flory-Huggins theory 4
9. Discuss the preparation, properties and applications of silicone polymers. 9

2. Describe the social organisation of honey bee. 9
3. What is learning ? Describe the classical and operant conditioning in animal with a mention of its mechanism. 9
4. What are the different characteristics of Biological clock and discuss their evidence and advantages. 9
5. Discuss the 'Mate choice' in animals by inter-sexual selection (male rivalry) and mention its significance. 9
6. Explain various types of 'bee dances' and their significance in honey bee. 9
7. Describe Instinctive behaviour in animals. 9
8. What is taxis ? Explain Tropotaxis and menotaxis with examples. 9
9. Describe courtship behaviour and parental care in three spine stickleback. 9

2018

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

1. Write notes on any *four* of the following : 6 × 4
 - a) Innate Behaviour
 - b) Klinokinesis
 - c) Sexual dimorphism
 - d) Circadian rhythm
 - e) Learning ability in honey bee
 - f) Reciprocal altruism
 - g) Brief profile of Niko Tinbergen
 - h) Reflex path.

ज) पाश्चात्य और भारतीय विचारकों के मतों को स्पष्ट करते हुए स्त्री विमर्श के उद्भव, विकास को दिखाइए ।

2. निम्न में से किन्हीं **चार** का उत्तर दीजिए । $7\frac{1}{2} \times 4$

क) भीमराव आम्बेदकर के दलित सम्बन्धी विचारों को स्पष्ट कीजिए ।

ख) स्त्री मुक्ति आन्दोलन क्या है ?

ग) आदिवासी आन्दोलन के विकास क्रम पर संक्षिप्त आलोचना कीजिए ।

घ) ओमप्रकाश वाल्मीकी के कृतित्व पर प्रकाश डालिए ।

ङ) 'महुआ का फूल' कहानी को संक्षिप्त आलोचना प्रस्तुत कीजिए ।

च) स्त्री विमर्श के विभिन्न रचनाओं का विश्लेषण कीजिए । (संक्षेप में)

छ) हिन्दी तथा अन्य भाषाओं के साहित्य में नारीविमर्श की आवश्यकता ।

ज) कात्यायनी के रचनाओं में नारी सम्बन्धी विचारों को स्पष्ट कीजिए ।

झ) हिन्दी कथासाहित्य में अस्मिता विमर्श ।

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. निम्न में से किन्हीं **चार** प्रश्नों का उत्तर दीजिए । $12\frac{1}{2} \times 4$

क) दलित विमर्श की अवधारणा को स्पष्ट करते हुए ज्योतिषा फूले योगदान पर आलोचना कीजिए ।

ख) स्त्री-विमर्श, नारीविमर्श या नारीवाद क्या है ? स्त्री विमर्श की विभिन्न रचनाओं का विश्लेषण कीजिए ।

ग) 'आदिवासी' विमर्श के अवधारणा को स्पष्ट करते हुए इसके प्रमुख साहित्यकारों के उपर प्रकाश डालिए ।

घ) कहानी तत्वों के आधार पर "पच्चीस चौ का देठ सौ" कहानी की समीक्षा कीजिए ।

ङ) 'आजादी' कहानी के उद्देश्यों को अपने शब्दों में व्याख्या कीजिए ।

च) 'सुनो ब्राम्हण' कविता में मलखान सिंह के विचारों को प्रस्तुत कीजिए ।

छ) 'सात भाइयों के बीच चम्पा' कविता के आधार पर कात्यायनी जी के नारी दृष्टि को दर्शाइए ।

ସିନିଟିକା ଯାହା କିଛି ଆମକୁ କିଏ ଆସି ଦୁଆ କଥା କହି ଦଉଡ଼ି,
ଆମେ ସେଥିରେ ମାତି ଯାଉଛୁ, ତାରି ପଛରେ ଗୋଡ଼େଇ ମରୁଛୁ ।

ଖ) ‘ନେ, ଏହାକୁ ମଧ୍ୟ ଖାଆ, ବ୍ରହ୍ମସ୍ତ୍ର ଖାଇଲୁ, ନିର୍ବଂଶ ହୋଇଯିବୁ ।’

ଅଥବା

ସେ ସମୟ ତୁଳନାରେ ବର୍ତ୍ତମାନ ଆନ୍ଦୋଳନେ ସ୍ୱର୍ଗ ରାଜ୍ୟରେ
ବାସ କରୁଅଛୁ ।

୪. ଯେ କୌଣସି **ଚାରେଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଦିଅ : 9 × ୪

- କ) ଭାବତନ୍ତ୍ର ଲାଭ କରିବାକୁ ହେଲେ କାହାର ସାଧନ ଆବଶ୍ୟକ ?
- ଖ) ସୌନ୍ଦର୍ଯ୍ୟ ଓ ପ୍ରେମର ଗଭୀର ଉଦାର ଭାବ କେଉଁ ଚନ୍ଦ୍ରରେ
ଦୃଷ୍ଟିଗୋଚର ହୁଏ ନାହିଁ ?
- ଗ) ମନ୍ତବ୍ୟ-ପ୍ରକାଶ କାହାକୁ କହନ୍ତି ?
- ଘ) କେଉଁମାନେ ସାହିତ୍ୟରେ ଓ କଳାରେ ସାଇକୋଲୋଜି ଖୋଜି
ବସନ୍ତି ?
- ଙ) ଏଃ ବଦା (ବୋଦା), ଏତେ ଦିନକେ ମନେ ପଡ଼ିଲା -ଏ କଥା
କିଏ କାହାକୁ କହିଛି ?
- ଚ) ଡକ୍ଟର କୃଷ୍ଣଚରଣ ପାଣିଗ୍ରାହୀ ସରକାରୀ ଚାକିରିରୁ କେବେ ଅବସର
ନେଇଥିଲେ ?
- ଛ) ଫକୀରମୋହନଙ୍କ ପିତାମହୀଙ୍କ ନାମ କ’ଣ ଥିଲା ?
- ଜ) ପିତାଙ୍କ ମୃତ୍ୟୁ ବେଳକୁ ଫକୀର ମୋହନଙ୍କ ବୟସ କେତେ ଥିଲା ?

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

୧. କ) ଯାହା ପ୍ରକୃତ ସୁନ୍ଦର, ତାହା ସମସ୍ତଙ୍କ ଚକ୍ଷୁରେ ସୁନ୍ଦର - ପଠିତ
ପ୍ରବନ୍ଧ ଅନୁସରଣରେ ଆଲୋଚନା କର । ୧୨

ଅଥବା

ଖ) ମନ୍ତବ୍ୟ ପ୍ରକାଶର ପ୍ରକୃତ ବିଧି ଓ ସାବଧାନତା ସଂପର୍କରେ ଲେଖକଙ୍କ
ମତାମତ ପଠିତ ପ୍ରବନ୍ଧ ଅନୁସରଣରେ ବିଶ୍ଳେଷଣ କର ।

୨. କ) ‘ମୋ ସମୟର ଓଡ଼ିଶା’ ଗ୍ରନ୍ଥ ଅବଲମ୍ବନରେ ଲୋଖକଙ୍କ ଜନ୍ମଭୂମିର
ଚିତ୍ର ପ୍ରଦାନ କର । ୧୨

ଅଥବା

ଖ) ‘ଆତ୍ମଜୀବନ ଚରିତ’ରୁ କେଉଁଝର-ପ୍ରଜା-ବିଦ୍ରୋହର ବିବରଣୀ ଓ
ଫକୀର ମୋହନଙ୍କ ଭୂମିକା ଦର୍ଶାଅ ।

୩. ସପ୍ତସଙ୍ଗ ସରଳାର୍ଥ ଲେଖ : ୪ + ୪

କ) ସୌନ୍ଦର୍ଯ୍ୟ ଓ ପ୍ରେମର ପୂର୍ଣ୍ଣ ଅଧିକାରୀ ହେଲେ, ମନୁଷ୍ୟର ଦେବତ୍ୱ
ଲାଭ ସୁନିଶ୍ଚିତ ।

ଅଥବା

3. Briefly answer any *two* of the following : 4 × 2

- a) Role of caste in state politics of India.
- b) Tribal Movements in India.
- c) Three Language Formula
- d) Dalit movements in India.

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Discuss the role of language in Indian Politics. 16

OR

Define Political Corruption. Discuss its causes and remedies.

2. Explain the role of Civil society in the Socio-Economic development of India. 16

OR

Discuss the causes of various peasant movements launched in Pre-Independence and Post Independence India.

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the shape of a solid of revolution moving in a flow of gas with least resistance. 8

OR

If a functional $I[y(x)]$ attains a maximum or minimum on $y = y_0(x)$, where the domain of definition belongs to certain class, then prove that at $y = y_0(x)$, $\delta I = 0$

2. Find the shortest distance between the parabola $y = x^2$ and the straight line $x - y = 5$. 8

OR

Find the curves on which the following functional can attain an extremum

$$I[y] = \int_0^{10} y^{13} dx, y(0)=0, y(10)=0.$$

[2]

Subject to the condition that the admissible curves cannot pass inside the area bounded by the circle

$$(x - y)^2 + y^2 = 9.$$

3. Derive Weirstrass function of the functional

$$I[y(x)] = \int_{x_1}^{x_2} F(x, y, y') dx, \quad y(x_1) = y_1, \quad y(x_2) = y_2. \quad 8$$

OR

a) Find the extremum of

$$I[y(x)] = \int_0^1 \left(x + 2y + \frac{1}{2}y^2 \right) dx, \quad y(0) = 0, \quad y(1) = 0.$$

b) Find the minimum of the functional

$$I[y] = \int_0^1 \left(\frac{1}{2}y'^2 + yy' + y' + y \right) dx$$

if the values at the ends of the interval are not given.

4. Solve the voltera equation of 1st kind

$$\int_0^x e^{(x-t)} y(t) dt = \sin x.$$

OR

[3]

Find the first two terms of the Neumann series for the equation

$$\phi(x) = \sin x + \lambda \int_0^{\pi/2} \cos(x^2 s) \phi(s) dx.$$

5. Solve the generalised Abel equation where $\alpha \in (0, 1)$.

$$f(x) = \int_0^x \frac{\phi(y)}{(x-y)^\alpha} dy \quad 8$$

OR

Solve the Volterra integral equation of the second kind of the convolution type using successive approximation method

$$f(x) = \phi(x) + \lambda \int_0^x e^{x-t} f(t) dt.$$

V-146-0.5

□□

[4]

Explain the different methods of determining advertising budget along with their merits. 13

2. Define advertising. Explain different medias of advertising with advantages and disadvantages of each. 13

OR

Define ad copy and explain different components of ad copy. 13

3. Select a company of your choice and outline the major components and considerations that you would include in your advertising plan. How would competitive situation affect the development of your plan ? 14

OR

- a) Define advertising agency, discuss the role of advertising agencies in the advertising industry. 7
b) Explain the prospecting in selling process. 7

III-PG-Com-XIII (FM/ASM)

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions from any *one* Section

SECTION - A

(FM)

1. What do you mean by business finance ? What is the scope of Finance Function in a business enterprise ? Should the goal of financial decision-making be profit-maximisation or wealth-maximisation ? 14

OR

"Investment, financing and dividend decisions are all inter-related". Comment.

2. A company is considering an investment proposal to purchase a machine costing Rs.2,50,000. The machine has a life expectancy of 5 years and no

[2]

salvage value. The company's tax rate is 40%. The firm uses straight line method for providing depreciation. The estimated cash flow before tax after depreciation (CFBT) from the machine are as follows :

Year	(FBT Rs.)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

Calculate : (a) Pay-back period, (b) Average Rate of Return, (c) Net Present Value and Profitability Index at 10% discount rate. You may use the following table :

Year	1	2	3	4	5
<i>P.V. factor at 10%</i>	0.909	0.826	0.751	0.683	0.621

OR

"Capital budgeting is a long-term planning for making and financing proposed capital outlays". Explain. What are the limitations of capital budgeting ?

13

[3]

3. Calculate the average cost of capital from the following information assuming tax rate as 55%

<i>Types of capital</i>	<i>Proportion in the new capital structure</i>	<i>Before tax cost of capital</i>
Equity capital	25%	24.44%
Preference capital	10%	27.29%
Debt capital	50%	7.99%
Retained Earnings	15%	18.33%

OR

What is meant by cost of capital ? What are the components of cost of capital ? What is the cost of retained earnings ? How is the cost of new equity capital issue determined ?

13

SECTION - B

(ASM)

1. State and explain the benefits and drawbacks of advertising.

13

OR

2. a) Discuss the compound nucleus theory of nuclear reaction. Hence obtain the expression for low energy Scattering cross section. 16

OR

- b) Give an account of Fermi theory of beta decay. Explain the Curie plot. Explain selection rules for allowed transitions with examples. 10+2+4
3. a) Discuss the classification of the particles according to their participation in various interactions. 5
- b) What are different conservation laws satisfied in different interactions ? 3
- c) Describe the Gellmann-Nishijima Schema and using it assign strangeness quantum numbers to the known strange baryons. 3+2

OR

- d) Show how SU(3) symmetry explains hadron classification in terms of meson and baryon octet. 7
- e) Describe briefly different types of quarks as constituents of elementary particles. 5

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What are non central forces ? Discuss their properties. 3
- b) On the basis of Yukawa theory explain how Isospin invariance leads to a charge independence of nucleon-nucleon force. 5
- c) Classify the different types of exchange forces and discuss their significance. 4

OR

- d) Outline the single particle shell model of nuclei. Hence explain the magic numbers. 7+2
- e) Using shell model calculate the Ground state spin and parity of the following nuclei : 3

 O^{17}, Ca^{40} .

- ଛ) 'ସ୍ଵାଧୀନତାର ନୂତନ ମୂଲ୍ୟବୋଧ' ପ୍ରବନ୍ଧକୁ ଭିତ୍ତିକରି ଲେଖକଙ୍କର ବକ୍ତବ୍ୟ କ'ଣ - ତାହା ଆଲୋଚନା କର ।
- ଜ) ଉନବିଂଶ ଶତାବ୍ଦୀରେ ରଚିତ ହୋଇଥିବା 'ରମ୍ୟରଚନା' ସଂପର୍କରେ ଏକ ନାତିଦୀର୍ଘ ପ୍ରବନ୍ଧ ଲେଖ ।
୨. 'ମାଦଳା ପାଞ୍ଜି'ରେ ବର୍ଣ୍ଣିତ ଯଯାତି କେଶରୀଙ୍କ ପ୍ରସଙ୍ଗରେ କେତେଦୂର ଐତିହାସିକ ସତ୍ୟତା ପରିଲକ୍ଷିତ ହୁଏ, ତାହା ବିଚାର କର । ୧୨.୫
୩. ଏକ ସଫଳ ରମ୍ୟରଚନା ଭାବେ 'ଇଚ୍ଛୁତି ଦାସିକେ'ର ମୂଲ୍ୟାୟନ କର । ୧୨.୫
୪. 'ବଗୁଆ' କିପରି ଓଡ଼ିଆ ସଂସ୍କୃତିର ପ୍ରତୀକ ଥିଲା, ତାହା ପ୍ରବନ୍ଧାନ୍ତସରଣରେ ଆଲୋଚନା କର । ୧୨.୫
୫. ଓଡ଼ିଆ ଆତ୍ମଜୀବନୀ ସାହିତ୍ୟ କ୍ଷେତ୍ରରେ 'ଜୀବନ ସ୍ମୃତି'ର ମୂଲ୍ୟାୟନ କର । ୧୨.୫
୬. 'ଦେଶେ ଦେଶେ' ଭ୍ରମଣ କାହାଣୀରୁ ପାଶ୍ଚାତ୍ୟ ମଣିଷଙ୍କ ଜାତୀୟତା ବୋଧ ଆଲୋଚନା କର । ୧୨.୫
୭. 'ବିଶ୍ଵଭ୍ରାତୃତ୍ଵ' 'ଦେ-ନେ' କାରବାର ଓ ବିଚାରବୋଧ ଉପରେ ପ୍ରତିଷ୍ଠିତ ନୁହେଁ -ଏହାର ଯଥାର୍ଥ୍ୟ ବିଚାର କର । ୧୨.୫
୮. 'ସମାଜବାଦୀ ମାନବିକତା' ପ୍ରବନ୍ଧର ବୈଶିଷ୍ଟ୍ୟ ଉଲ୍ଲେଖ କର । ୧୨.୫

2018

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

୧. ଯେ କୌଣସି **ଚାରେଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ପ୍ରଦାନ କର : ୭.୫×୪
- କ) 'ମାଦଳା ପାଞ୍ଜି' ଏକ ପ୍ରାଚୀନ ଓଡ଼ିଆ ଗଦ୍ୟ ସାହିତ୍ୟର ଗ୍ରନ୍ଥ ଭାବେ କେଉଁ କେଉଁ ଆଲୋଚକ ସ୍ଵୀକାର କରିଛନ୍ତି ତା'ର ଏକ ବିବରଣୀ ସେମାନଙ୍କ ମତ ସହ ପ୍ରଦାନ କର ।
- ଖ) 'ଭୁଲ' ରମ୍ୟରଚନା ଭୁବନେଶ୍ଵର ବେହେରାଙ୍କ ଏକ ଅନବଦ୍ୟ ସୃଷ୍ଟି - ଆଲୋଚନା କର ।
- ଗ) "ଆତ୍ମଜୀବନୀ" ହେଉଛି ଜୀବନୀ ସାହିତ୍ୟର ପରବର୍ତ୍ତୀ ବିକାଶ"- ଏ କଥାର ସତ୍ୟାସତ୍ୟ ଜୀବନୀ ସାହିତ୍ୟ ଆଧାରରେ ଉଲ୍ଲେଖ କର ।
- ଘ) 'ଦେଶେ ଦେଶେ' ଓଡ଼ିଆ ଭ୍ରମଣ ସାହିତ୍ୟର ଶ୍ରୀ ସମୂହ କରିଛି । ଆଲୋଚନା କର ।
- ଙ) 'ବିଶ୍ଵଭ୍ରାତୃତ୍ଵ' ପ୍ରବନ୍ଧର ତାତ୍ପର୍ଯ୍ୟ ନିରୂପଣ କର ।
- ଚ) 'ଅନନ୍ତ ପ୍ରେମ' ପ୍ରବନ୍ଧ ଅନୁସରଣରେ ପ୍ରକୃତ ପ୍ରେମ, ଜ୍ଞାନ ଓ ପବିତ୍ରତା ସଂପର୍କରେ ଉଲ୍ଲେଖ କର ।

II. Assets

1) Non-Currents Assets :

a) Fixed Assets :

i) Tangible Assets	3	1,65,000	1,55,000
ii) Intangible Assets (Goodwill)		80,000	1,00,000

2) Current Assets :

a) Inventory (Stock)		25,000	35,000
b) Trade Receivables (Debtors)		50,000	30,000
c) Cash and Cash Equivalents		47,000	10,000

Total		3,67,000	3,30,000
-------	--	----------	----------

Notes :		31.3.18	31.3.17
		(Rs.)	(Rs.)

1. Reserves and Surplus :

Balance Profit and Loss		1,20,000	1,00,000
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2. Long term Borrowings :

Bank loan		50,000	40,000
Loan from financial institutions		–	25,000
		50,000	65,000

3. Tangible Assets :

Machinery		55,000	80,000
Land		50,000	40,000
Building		60,000	35,000
		1,65,000	1,55,000

Other information :

- i) Dividend paid Rs.15,000 during the year.
- ii) Rs.20,000 worth of machinery was sold at book value.

2018

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

1. Answer any **four** of the following : 7½ × 4
 - a) Distinguish the nature of financial statements.
 - b) Distinguish between funds flow and cash flow statement.
 - c) Discuss the types of financial statement analysis.
 - d) Discuss the problems encountered in financial statement analysis.
 - e) Describe the direct method of computing cash from operating activities.
 - f) Discuss the various ratios which serve the purpose of determining the solvency of the business concern.
 - g) Distinguish between traditional and integrated Reporting.
 - h) A company's equity shares are being treated in the market at Rs.48 per share with a price-earning ratio of 8. The company's dividend payout is 80%. It has

[2]

1,00,000 equity shares of Rs.10 each and no preference shares.

Calculate :

- i) Earning per share
 - ii) Net Income
 - iii) Dividend Yield.
2. Discuss the various types of financial statements that are usually prepared by the businessmen. 12½
 3. What is the importance of comparative statements to the management ? Illustrate your answer with particular reference to comparative income statement and state briefly how this statement is prepared and interpreted. 12½
 4. What are the important profitability ratios ? How are they worked out ? Explain and Illustrate. 12½
 5. What is the difference between univariate and multivariate analysis ? Elaborate on the different statistical tools used in multivariate Analysis. 12½
 6. From the following details, make out the Balance Sheet with as details as possible : 12½
 - i) Stock Velocity (Turnover) 6 times
 - ii) Capital Turnover Ratio 2 times

[3]

- iii) Fixed Assets Turnover 4 times
- iv) Gross Profit Turnover 20%
- v) Debtors Velocity 2 months
- vi) Creditors Velocity 73 days

The gross profit was Rs.60,000.

Closing Stock was Rs.5000 in excess of opening stock. All the purchases and sales were made on credit.

7. Statutory and Non-Statutory reports are integral part of a reporting system of an Organisation. Discuss. 12½
8. From the Balance Sheets of X Ltd. as at 31.3.2018 given below. Prepare Cash Flow Statement : 12½

Particulars	Note no.	31.3.18 (Rs.)	31.3.17 (Rs.)
I. Equity and Liabilities			
1. Shareholders' funds:			
a) Share Capital		1,53,000	1,25,000
b) Reserves and Surplus	1	1,20,000	1,00,000
2. Non-Current Liabilities :			
a) Long term Borrowings	2	50,000	65,000
3. Current Liabilities :			
Trade Payables (Creditors)		44,000	40,000
Total		3,67,000	3,30,000

୨. 'ଭାଷା' କାହାକୁ କୁହାଯାଏ ? ଏହାର ଶିକ୍ଷାଦାନର ବିବିଧ ପଦ୍ଧତି ଆଲୋଚନା କରିବା ସଂଗେ ସଂଗେ ଏହା ସଭ୍ୟ ମଣିଷର କି ପ୍ରକାର ଉପକାର କରେ ତାହା ଦର୍ଶାଅ । ୧୨.୫
୩. ବ୍ୟାକରଣ କହିଲେ କ'ଣ ବୁଝ ? କ୍ରିୟାପଦର ଶିକ୍ଷାଦାନ ପ୍ରଣାଳୀ କିପରି ହେବା ଉଚିତ । ୧୨.୫
୪. କବିତାର ବିଭାଗୀକରଣ କରିବା ସଂଗେ ସଂଗେ ମହାକାବ୍ୟ ଓ ଖଣ୍ଡକାବ୍ୟ ଭିତରେ ପ୍ରଭେଦ ଦର୍ଶାଅ । ୧୨.୫
୫. ଗଦ୍ୟ ଶିକ୍ଷାଦାନ ଫଳରେ ପ୍ରବନ୍ଧ ସାହିତ୍ୟକୁ କେତେ ଭାଗରେ ବିଭକ୍ତ କରାଯାଏ । ପ୍ରବନ୍ଧ ଓ ରମ୍ୟରଚନା ଭିତରେ ଥିବା ପ୍ରଭେଦକୁ ଦର୍ଶାଅ । ୧୨.୫
୬. କ୍ଷୁଦ୍ରଗଳ୍ପ କହିଲେ କ'ଣ ବୁଝ ? ଏହାର ଶିକ୍ଷାଦାନ କିପରି ହେବା ଉଚିତ ? ୧୨.୫
୭. ଉପନ୍ୟାସର ସଂଜ୍ଞା, ସ୍ୱରୂପ ପ୍ରଦାନ ପୂର୍ବକ ଓଡ଼ିଆ ସାହିତ୍ୟର ଆଦି ଭାଗର ଉପନ୍ୟାସ ଗୁଡ଼ିକୁ ତର୍ଜମା କର । ୧୨.୫
୮. ପଠନ କଳାର ଉପାଦେୟତା ନିର୍ଣ୍ଣୟ କରିବା ସଂଗେ ସଂଗେ ଏହାର ଲକ୍ଷ୍ୟ କ'ଣ ହେବା ଉଚିତ ତାହା ନିର୍ଣ୍ଣୟ କର । ୧୨.୫
୯. ଚତୁର୍ଦ୍ଧାପଦୀ କବିତା କହିଲେ କ'ଣ ବୁଝ ? ଓଡ଼ିଆ ସାହିତ୍ୟରେ ଏହା କିପରି ବିସ୍ତାର ଲାଭ କରିଛି ? ୧୨.୫

2018

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

୧. ଯେ କୌଣସି ଚାରେଟିର ଉତ୍ତର ଲେଖ : ୭.୫×୪
- କ) ଭାଷା ଶିକ୍ଷାଦାନର ଆବଶ୍ୟକତା କ'ଣ ?
- ଖ) ବ୍ୟାକରଣ କାହାକୁ କହନ୍ତି ? ଏହା କିପରି ଭାଷାକୁ ସୁସଂହତ କରେ ?
- ଗ) କବିତା ଆମେ କାହିଁକି ପଢ଼ିବା ? ଶିକ୍ଷାଦାନ କରିବା ଫଳରେ ଆମେ କେଉଁ ପ୍ରକାର ଉପକାର ପାଉ ?
- ଘ) ଗଦ୍ୟର ପ୍ରକାର ଭେଦ ଦର୍ଶାଇ ପ୍ରବନ୍ଧ ସାହିତ୍ୟ ବ୍ୟତୀତୀ ଆଉ କେଉଁ ପ୍ରକାର ରଚନାକୁ ଗଦ୍ୟ ବୋଲି କୁହାଯାଇ ପାରିବ ?
- ଙ) 'କଥା ସାହିତ୍ୟ ସାଂପ୍ରତିକ ସମାଜର ବେଦ' - ଏହି ଉକ୍ତିର ସାରବତ୍ତା ପ୍ରତିପାଦନ କର ।
- ଚ) ପଠନ କଳାର ବିବିଧତାକୁ ନିର୍ଣ୍ଣୟ କର ।
- ଛ) ଗଳ୍ପର ଏକ ସଂଜ୍ଞା ନିରୂପଣ କର ।
- ଜ) ସ୍ୱରବର୍ଣ୍ଣ ଓ ବ୍ୟଂଜନ ବର୍ଣ୍ଣ ଭିତରେ ପ୍ରଭେଦ ନିର୍ଣ୍ଣୟ କର ।

- ଖ) ପ୍ରତ୍ୟେକ ବ୍ୟକ୍ତି ଭିତରେବୋଧହୁଏ ଗୋଟାଏ ଗୋଟାଏ ଯାଯାବର ମନୋବୃତ୍ତି ଛପି ରହିଛି ।
- ଗ) ପଶୁପକ୍ଷୀକୁ ଆୟତ୍ତ କରିବାର ସାଧନା ଅତି ସହଜ, କିନ୍ତୁ ମଣିଷକୁ ଆୟତ୍ତ କରିବା କଷ୍ଟ; କାରଣ ନଜକୁ ଆୟତ୍ତ କରିବା ଦୁଃସାଧ୍ୟ ।
- ଘ) ଏପରି ଧୀର ଶିର ଶାନ୍ତ ମନର ଅଧିକାରୀ ହିଁ ଅମୃତର ସନ୍ତାନ ।

୪. ଯେ କୌଣସି **ଚାରୋଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଲେଖ : 9 X ୪

- କ) ‘ଏକସପ୍ତେରିମେଷୁ’ ଅନୁଷ୍ଠାନର ପ୍ରତିଷ୍ଠାତା କିଏ ?
- ଖ) ‘ତମାଳତାଳୀ ବନରାଜିନୀଳା’ - ବୋଲି କେଉଁ କବି କହିଥିଲେ ?
- ଗ) ଲେଖକ କେଉଁ ଜାହାଜରେ ଲଣ୍ଡନ ଯାତ୍ରା କରିଥିଲେ ?
- ଘ) ଟ୍ରାଫାଲଗାର ଷ୍ଟୋୟାରରେ କାହାର ମୂର୍ତ୍ତି ରହିଛି ?
- ଙ) ଭକ୍ତି ଭାବ ହୃଦୟରେ ଜଗାଇବା ପାଇଁ କାହାର ବିଧାନ କରାଯାଏ ?
- ଚ) ନିଜର ସ୍ଵାଚ୍ଛନ୍ଦ୍ୟକୁ ଉପେକ୍ଷା କରି ଅନ୍ୟକୁ ସୁଖ ଦେଇ ତୃପ୍ତି ପାଇବାର ନାମ କ’ଣ ?
- ଛ) ରାମାୟଣ ଓ ମହାଭାରତରେ କାହାକୁ ନାଟର ଗୋବର୍ଦ୍ଧନ ବୋଲି ଧରି ନିଆଯାଇପାରେ ?
- ଜ) ଚାଷୀଟି କେତେବେଳେ ଭଗବାନଙ୍କ ନାମ ନିଏ ?

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks
Answer **all** questions

୧. କ) ‘ଆମେରିକା ଅନୁଭୂତି’ରୁ ଲେଖକଙ୍କ କ୍ୟାମ୍ପ ଜୀବନ ଉଲ୍ଲେଖ କର । ୧୨

ଅଥବା

ଖ) ‘ଦେଶେ ଦେଶେ’ ପୁସ୍ତକ ଭିତ୍ତିରେ ଲେଖକଙ୍କ ପ୍ୟାରିସ୍ ଅନୁଭୂତି ବର୍ଣ୍ଣନା କର ।

୨. କ) ‘ପତ୍ର ଓ ପ୍ରତିମା’ ପୁସ୍ତକରେ ଥିବା ‘ଭକ୍ତି’ ପ୍ରବନ୍ଧର ଭାବଧାରା ବିଶ୍ଳେଷଣ କର । ୧୨

ଅଥବା

ଖ) ରମ୍ୟରଚନା ଦୃଷ୍ଟିରୁ ‘ନାଟର ଗୋବର୍ଦ୍ଧନ ପ୍ରବନ୍ଧର ମୂଲ୍ୟାୟନ କର ।

୩. ଯେ କୌଣସି **ଦୁଇଟିର** ସପ୍ତସଙ୍କ ବ୍ୟାଖ୍ୟା ଲେଖ : ୪ + ୪

କ) ଚେଷ୍ଟା ନ କରି ଅନୁତାପ କରିବା ଅପେକ୍ଷା ଚେଷ୍ଟା କରି ହତାଶ ହେବା ଭଲ ।

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

- a) System Approach of David Easton.
- b) Post-behaviouralism
- c) Karl Marx's views on Alienation
- d) Max Weber's views on Social Stratification.

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Define Political Sociology. Discuss the scope and dimensions of political sociology. 16

OR

Explain the Behavioural approach to the study of Political Sociology.

2. Discuss the contribution of Max Weber to Political Sociology. 16

OR

Analyse Emile Durkheim's views on Suicide and Religion.

V-149-50



[2]

III-PG-Phy-XIV

2. a) Derive Lindhards expression for the dielectric function $\epsilon(q, \omega)$. Find its limiting value on the static screening approximation. 9+3

OR

- b) Write short notes on the following : 2 × 6
- Friedel Oscillations and Friedel Simmle
 - Dielectric constant of semiconductor.
3. a) Derive the linearized Boltzmann transport equation. Using this equation derive an expression for electrical conductivity. 8+6

OR

- b) Define Wannier function. Discuss the orthogonal property and wannier function. Derive equation of motion in the Wannir representation 2+3+9

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Explain the concept of Born-Oppenheimer approximation. How this idea is used to set up the effective Hamiltonian for lattice vibration. 10
- b) Describe the tight binding method for explaining energy bands in solid. 4

OR

- c) Explain and derive the origin of the forbidden energy gap in the crystalline solids. 10
- d) Write a note on quantization of lattice vibration. 4

[2]

- c) Explain with examples different psychological principles of teaching.
- d) Discuss with example inductive-deductive method to teaching. State the merits and demerits.

V-249-1.2



III-UG-IBED(P)-VI (PS)

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *two* of the following : 7½ × 2
 - a) Explain the meaning and characteristics of teaching.
 - b) Describe the concept of teaching task.
 - c) Discuss the significance of reflective level of teaching task.
 - d) Elucidate the child-centred approach to learning.

2. Answer any *two* of the following : 12½ × 2
 - a) Describe formal communication theory and discuss its short comings.
 - b) Prepare a lesson plan on any one school subject by following ICON Design model.

5. Solve the following assignment problem using Hungarian method. The matrix entries are processing times in hours :

		Operator				
		O ₁	O ₂	O ₃	O ₄	O ₅
Job	J ₁	20	22	35	22	18
	J ₂	4	26	24	24	7
	J ₃	23	14	17	19	19
	J ₄	17	15	16	18	15
	J ₅	16	19	21	19	25

OR

Find the optimum assignment and the maximum sales from the following problem :

		Zones			
		A	B	C	D
Sales Engineer	P	140	112	98	154
	Q	90	72	63	99
	R	110	88	77	121
	S	80	64	56	88

The matrix entries are sales in rupees

2018

Full Marks - 40

Time - 3 Hours

The questions are of equal value

Answer **all** questions

Symbols used have their usual meanings

1. A company makes three types of belts A, B and C which are processed on three machines M₁, M₂ and M₃. Belt A required 2 hours on Machine M₁ and 3 hours on Machine M₃. Belt B requires 3 hours on machine M₁, 2 hours on machine M₂ and 2 hours on Machine M₃; and Belt C requires 5 hours on Machine M₂ and 4 hours on Machine M₃. There are 8 hours of time per day available Machine M₁, 10 hours per day available on machine M₂ and 15 hours of time per day available on machine M₃. The profit gained from belt A is Rs.3.00 per unit, from belt B is Rs.5.00 per unit, from belt C is Rs.4.00 per unit. What should be the daily production of each type of belts so that the profit is maximum.

OR

Use duality to solve the following L.P.P :

Maximize $z = 2x_1 + x_2$

Subject to $x_1 + 2x_2 \leq 10, x_1 + x_2 \leq 6, x_1 - x_2 \leq 2,$

$x_1 - 2x_2 \leq 1, x_1, x_2 \geq 0$

[2]

2. Given the L.P.P.

$$\text{Maximize } z = 3x_1 + 5x_2$$

$$\text{subject } x_1 \leq 4, x_2 \leq 6, 3x_1 + 2x_2 \leq 18 ; x_1, x_2 \geq 0.$$

Discuss the effect on the optimality of the solution, when the objective function is changed to $3x_1 + x_2$.

OR

Use branch and bound method to solve the following L.P.P. :

$$\text{Maximize } z = 7x_1 + 9x_2$$

$$\text{subject to } : -x_1 + 3x_2 \leq 6, 7x_1 + x_2 \leq 35, x_2 \leq 7;$$

$$x_1, x_2 \geq 0 \text{ and are integers.}$$

3. Use simplex method to solve the following goal programming problem :

$$\text{minimize } z = p_1d_1^- + 5p_3d_2^- + 3p_3d_3^- + p_2d_4^+ + p_4d_1^+$$

$$\text{subject to } : x_1 + x_2 + d_1^- - d_1^+ = 80,$$

$$x_1 + x_2 + d_4^- - d_4^+ = 90,$$

$$x_1 + d_2^- = 70, x_2 + d_3^- = 45 ;$$

$$x_1, x_2, d_1^+, d_2^-, d_3^-, d_4^-, d_4^+ \geq 0$$

OR

Use revised simplex method to solve the L.P.P. :

$$\text{maximize } z = 3x_1 + 2x_2 + 5x_3$$

$$\text{subject to } x_1 + 2x_2 + x_3 \leq 430, 3x_1 + 2x_3 \leq 460.$$

$$x_1 + 4x_2 \leq 420, x_1, x_2, x_3 \geq 0.$$

[3]

4. Consider the following transportation problem :

Factory	Godowns						Stock available
	I	II	III	IV	V	VI	
A	7	5	7	7	5	3	60
B	9	11	6	11	--	5	20
C	11	10	6	2	2	8	90
D	9	10	9	6	9	12	50
Demand	60	20	40	20	40	40	

It is not possible to transport any quantity form factory B to Godown 5. Determine :

- Initial solution by Vogel's approximation method
- Optimal basic feasible solution
- Find an alternative B.F.S. if exist.

OR

Maximize the following T.P. using highest profit method :

	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	Supply
F ₁	35	41	28	16	20	12	320
F ₂	14	21	28	30	15	24	180
F ₃	45	18	17	29	26	19	200
Demand	125	125	100	100	175	75	

III-PG-COM-XIV (SAPM/IM)

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions from any *one* Section

SECTION - A

(SAPM)

1. "No Investment Decisions are made without calculating risk'. Do you agree ? As an investment manager of a firm, discuss the various steps involved on the investment decision making process. 13

OR

How the risk of a security can be measured ? Explain different statistical methods to measure risk. 13

2. What do you understand by marketing of securities ? Explain the different methods of marketing corporate securities. 13

OR

[2]

What is Securities and Exchange Board of India ?
Give its objectives. How does it regulate the capital
market in India ? 13

3. What do you mean by listing of securities ? Give an
account of Listing Agreement. When and how shares
can be delisted ? 14

OR

Discuss about the role and need of Depository's
Act, 1996. 14

SECTION - B

(IM)

1. "Operating in international market is much more
complex than marketing domestically". Critically
evaluate the statement with suitable examples. 14

OR

What are the different types of control that an
organisation can adopt while implementing
international market strategies. 14

[3]

2. Describe briefly on any four international marketing
environmental factors. 13

OR

As the first time exporter of wooden handicrafts from
India, evaluate the various models of entry available
for entering into foreign markets. Which mode of
entry would you prefer and why ? 13

3. Explain the various product decisions that one needs
to take into account before going international. 13

OR

What factors would you consider for pricing your
products before entering international market. 13

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *ten* of the following : 2 × 10
- a) Where are the ecological significance of Bryophytes ?
 - b) What do you mean by Gemma Cup ?
 - c) Briefly describe the classification of Bryophytes ?
 - d) What are the characteristic feature of the capsule of *Funaria* ?
 - e) Differentiate between leptosporangiate and eusporangiate sporangia.
 - f) Write few important characters of the subdivision Lycopsidea.
 - g) On what basis *Cycadeoidea* is considered as a probable ancestors of angiosperms.

[2]

- h) What are the important characteristic features of coniferales.
 - i) What do you mean by living fossils ?
 - j) What are the angiospermic characters of *Gnetum*.
 - k) Write few important characters of Psilophytales.
 - l) What do you mean by soral evolution ?
2. a) Describe briefly the progressive sterilization of sporogenous tissue in Bryophytes. 10
- b) Describe the vegetative structure of *Marchantia*. 10

OR

- c) Describe briefly the evolution of gametophytes in Bryophytes. 10
 - d) Describe the internal structure of the capsule of *Funaria*. 10
3. a) Describe the stelar evolution in pteridophytes. 10

[3]

- b) Describe the morphology and evolutionary significance of the sporocarp of *Marsilea*. 10

OR

- c) Describe the heterospory and seed habit in Pteridophytes. 10
- d) Describe the anatomy of the stem of *Lycopodium*. 10

4. a) Describe the process of fossilization. 10
- b) Describe briefly the internal structure of the coralloid root of *Cycas*. 10

OR

- c) Evolution of female gametophytes in Gymnosperm. 10
- d) Give an account of the internal structure of the needle of *Pinus*. 10

[2]

III-PG-ODI-XV

୩. ଯେ କୌଣସି **ହୁଇଟିର** ସଂକ୍ଷିପ୍ତ ଚିତ୍ରଣା ଲେଖ : ୪ + ୪

କ) ବାକ୍ୟ ବିଜ୍ଞାନ

ଖ) ଦୈବୀ ଉତ୍ପତ୍ତି ସିଦ୍ଧାନ୍ତ

ଗ) ବୈଦିକ ଭାଷା

ଘ) ପ୍ରାକୃତ ଭାଷା ।

2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

୧. ଭାଷାବିଜ୍ଞାନର ପରିସର ଓ ପ୍ରକାରଭେଦ ଦର୍ଶାଅ । ୧୬

ଅଥବା

ଉପଭାଷା ସୃଷ୍ଟିର କାରଣ, ପାର୍ଥକ୍ୟ ଓ ପରିସର ସଂପର୍କରେ ଆଲୋଚନା କର ।

୨. ପୃଥିବୀର ବିଭିନ୍ନ ଭାଷାଗୋଷ୍ଠୀ ସଂପର୍କରେ ସୂଚନା ଦିଅ । ୧୬

ଅଥବା

ନବୀନ ଭାରତୀୟ ଆର୍ଯ୍ୟ ଭାଷାର ପରିଚୟ ପ୍ରଦାନ କର ।

V-155-0.5



V155

[Turn Over

3. Write short notes on any *two* of the following: 4 + 4

- a) Elements of unity and diversity in India.
- b) Political participation is the process by which people acquire Pol. Values.
- c) Factors of social change
- d) Problems of urbanisation.

V-156-0.5



2018

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Analyse the problems and challenges to national integration in India. 16

OR

- b) What do you mean by Identity Politics ? Discuss how identity politics operates with reference to SCs and STs in India.

2. a) Define Sanskritisation. Discuss its role in the process of social change in India. 16

OR

- b) Discuss the problems of industrialisation in India and suggest remedial measures.

b) If f is an arithmetical function, and

$$g(n) = \sum_{d|n} f(d)$$

then prove that $f(n) = \sum_{d|n} \mu(d) g\left(\frac{n}{d}\right)$

OR

c) Prove that every even perfect number is of the form 2^np , where $p = 2^{n+1} - 1$ is a mersenne prime.

d) Prove that for every $\delta > 0$, we have

$$\frac{\varphi(n)}{n^{1-\delta}} \rightarrow \infty, \text{ as } n \rightarrow \infty.$$

V-155-0.5



2018

Full Marks - 40

Time - 3 Hours

The questions are of equal value

Answer *all* questions

Symbols used have their usual meaning

1. a) Prove that any two different Fermat numbers are relatively prime.

b) Prove that every non-trivial module S consists of all integral multiples of a positive integer.

OE

c) The standard form of an integer n , which is greater than 1, is unique. Prove this.

d) If $N > 1$, then show that no two successive fractions in F_N have the same denominator.

2. a) Show that the congruence

$$a_0x^n + a_1x^{n-1} + \dots + a_n \equiv 0 \pmod{p}, (a_0, p) = 1$$

has at most n solutions.

V-155

[Turn Over

[2]

- b) If $(m, m') = 1$, and if a runs through a complete prime residue system $(\text{mod } m)$, and a' through a complete prime residue system $(\text{mod } m')$, then show that $am' + a'm$ runs through a complete prime residue system $(\text{mod } mm')$.

OR

- c) Prove that $\sum_{d|m} \varphi(d) = m$
- d) Prove that residue classes modulo a prime p form a field of p elements.
3. a) If ξ is irrational, then show that there exist infinitely many irreducible fractions h/k , such that $\left| \xi - \frac{h}{k} \right| < \frac{1}{2k^2}$
- b) If n is a positive integer and $n \mid (A^2 + B^2)$, where $(A, B) = 1$, then prove that there exist integers s and t , such that $n = s^2 + t^2$.

OR

- c) If p is a prime, then show that $(p-1)! \equiv -1 \pmod{p}$.

[3]

d) Prove that $\left(\frac{m}{p}\right)\left(\frac{n}{p}\right) = \left(\frac{mn}{p}\right)$.

4. a) Prove that every positive integers n is a sum of four squares.
- b) A positive integers n is a sum of two squares if and only if all its prime factors of the form $4K+3$ have even exponents in the standard form of n . Prove this.

OR

- c) If p is an odd prime, then show that

$$\left(\frac{2}{p}\right) = (-1)^{\frac{p^2-1}{8}}.$$

- d) If q is a fixed odd prime, then prove that

$$\left(\frac{q}{p}\right) = \left(\frac{q}{p'}\right),$$

where p' is a prime such that $p' \equiv p \pmod{4q}$.

5. a) Prove that $D(N) = N \log N + O(N)$.

- ଚ) 'ପଢ଼ିଲେ ଜାଣିବୁ ସବୁ ଆରେ ଧନ ଯୋଥୁ ଅଛି ଆମ ଘରେ' - ଏକଥା କିଏ କାହାକୁ କହିଛନ୍ତି ?
- ଠ) ଯଯାତି କେଶରୀ କେଉଁ ନଦୀ କୂଳରେ ଯାଗ କରିଥିଲେ ?
୨. କ) 'ମହାଯାତ୍ରା'ର ପଠିତାଂଶରୁ ରାଧାନାଥଙ୍କ ପ୍ରତିଭା ଆକଳନ କର । ୨୦
- ଅଥବା
- ଖ) 'କୀଚକବଧ' କାବ୍ୟରୁ ଗଙ୍ଗାଧରଙ୍କ ପ୍ରକୃତି ଚିତ୍ରଣର ବୈଶିଷ୍ଟ୍ୟ ପ୍ରତିପାଦନ କର ।
୩. କ) 'ବାଜିରାଉତ' କବିତାରେ କବି କିପରି ସ୍ୱଦେଶ ପ୍ରୀତିର ଉଦ୍‌ବୋଧନ ଗାନ କରିଛନ୍ତି ଆଲୋଚନା କର । ୨୦
- ଅଥବା
- ଖ) 'କୋଣାର୍କ' କାବ୍ୟରେ ସ୍ୱଦେଶର ଗୌରବ ଗାଧା କିପରି ପ୍ରତିଧ୍ୱନିତ ହୋଇଛି ଉଲ୍ଲେଖ କର ।
୪. କ) 'ଶର୍ମିଷ୍ଠା' କାବ୍ୟର ପଠିତାଂଶ ଅନୁସରଣରେ କବିଙ୍କ ନୈତିକ ଦୃଷ୍ଟିଭଙ୍ଗୀର ପରିଚୟ ପ୍ରଦାନ କର । ୨୦
- ଅଥବା
- ଖ) ଜାତି ପ୍ରୀତିର ଅମରଗାଥା ହେଉଛି 'ଧର୍ମପଦ' - ବିଚାର କର ।

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks
Answer *all* questions

୧. ଯେ କୌଣସି *ଦଶଟିର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଲେଖ : ୨×୧୦
- କ) କେଉଁ ତୀର୍ଥରେ ଯାଦବ ବଂଶ ଧ୍ୱଂସ ହୋଇଥିଲେ ?
- ଖ) କେଉଁ ସାଗରରେ ଅର୍ଜୁନ ଧନୁ ତୁଣୀର ଫିଙ୍ଗିଥିଲେ ?
- ଗ) ରମାବେୀ-କେଳି ଘର ବୋଲି କେଉଁ ନଗରକୁ କୁହାଯାଇଛି ?
- ଘ) ବସନ୍ତ ବିଜୟ ବାର୍ତ୍ତା କିଏ ପାଠ କରିଥିଲା ?
- ଙ) ମହାବଳ ରଢ଼ି କେଉଁଠାରୁ ଭାସି ଆସେ ?
- ଚ) ଶତାବ୍ଦୀର ଶ୍ରେଷ୍ଠ ଫୁଲ ମୁକୁଳିତ 'ମୃତ୍ୟୁହୀନ' ପ୍ରାଣ ବୋଲି କାହାକୁ କୁହାଯାଇଛି ?
- ଛ) ଲୁଗାରେ ହଳଦୀ ଲଗାଇ କିଏ ଚାହିଁଥିବେ ?
- ଜ) 'ମୁହଁ ଦିନେ ଶିଶୁ ଥିଲି, ମନେ ପଡ଼ୁଛି ମୋର' - ଏକଥା କିଏ, କେଉଁଠି ଓ କେତେବେଳେ କହିଛନ୍ତି ?
- ଝ) ନହୁଷ ନନ୍ଦନ କିଏ ?
- ଞ) କହିବା ଲୋକ ଓ ସହିବା ଲୋକ ମଧ୍ୟରେ ମହତ କିଏ ?

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. भारतीय जनजागरण के कारण और स्वरूप पर प्रकाश डालिए । 20

अथवा

द्विवेदी युगीन काव्यप्रवृत्तियों की विशेषताएं बताइए ।

अथवा

क) भारतेन्दु की आधुनिक चेतना

ख) द्विवेदी का योगदान ।

2. छायावाद अथवा प्रगतिवाद की काव्यप्रवृत्तियों पर विस्तार से विचार
किजीए । 20

अथवा

क) प्रयोगवाद के उद्भव-विकाश

ख) नई कविता की विशेषताएँ ।

[2]

3. हिन्दी नाटक अथवा उपन्यास साहित्यकी विकासधारा का सम्यक् विवेचन कीजिए । 20

अथवा

- क) प्रसाद की नाट्यकला
- ख) भारतेन्दुकालीन निबंध साहित्य ।
4. निम्न प्रश्नों में से किन्हीं दश के संक्षिप्त उत्तर दीजिए : 2 × 10
- क) नवजागरण का अर्थ
- ख) भारतेन्दु की आधुनिकता
- ग) भारतेन्दुकालीन निबंध की विशेषताएँ
- घ) स्वच्छन्दावाद का अर्थ
- ङ) छायावाद नाम कितना सार्थक है ?
- च) प्रगतिवाद पर मार्क्सवाद का प्रभाव ।
- छ) प्रयोगवादी अन्वेषी है, कैसे ?

[3]

- ज) नई कविता की दो प्रमुख विशेषताएँ ।
- झ) जयशंकर प्रसाद की दो मुख्य काव्य प्रवृत्तियाँ ।
- ड) निराला का निरालापन क्या है ?
- ट) उपन्यास जीवन की आलोचना कैसे है ?
- ठ) प्रेमचन्द के उपन्यास कृषक-कथा है, कैसे ?

V-278-0.5

□□

2018

Full Marks - 80

Time - 3 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. Answer briefly on any *ten* of the following : 2×10
 - a) Causal Theory
 - b) Positivization of social sciences
 - c) Critique of metanarrative
 - d) Ideology as false consciousness
 - e) Political equality
 - f) Direct democracy
 - g) Social welfare theory of rights
 - h) 'Original position' in Rawl's Theory
 - i) Justice as a term of synthesis
 - j) Radical eco-feminism

[2]

- k) New Social Movement
 - l) Hyperfactualism.
2. a) Discuss the evolution of political theory. 10
- b) 'Political Theory is Thriving both at its behavioural and traditional levels'. Explain the statement in the context of resurgence of political theory. 10

OR

- c) Examine the liberal approach to political theory. 10
 - d) Analyze Marxist view of state. 10
3. a) Discuss the genesis of the 'End of Ideology' debate and its content. 10
- b) What is feminism ? Critically examine liberal feminism. 10

OR

- c) Examine the role of Ideology in Politics. 10

[3]

- d) Discuss the cluster of concepts that constitute the core of the post-modern intellectual agenda. 10
4. a) Discuss the evolution of democracy. 10
- b) Explain the meaning and nature of Rights. 10

OR

- c) Highlight the different dimensions of equality. 10
- d) Do you think that Rawlsian justice has a strong egalitarian bias ? Give arguments in support of your answer 10

V-179-0.5



2018

Full Marks - 80

Time - 3 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. Answer any *ten* of the following : 2 × 10
- a) What do you mean by experimental research ?
 - b) What is an independent variable ?
 - c) What do you mean by hypothesis in research ?
 - d) What is positive correlation ?
 - e) What do you mean by randomization ?
 - f) What is reliability ?
 - g) What is a control group ?
 - h) What is test-retest reliability ?
 - i) Differentiate between probability and non-probability sampling techniques ?
 - j) What are the different characteristics of a psychological test ?

[2]

- k) What do you mean by pilot study ?
- l) What is case study design ?
- 2. a) What are the various characteristics of a scientific method ? 10
- b) Give an account of correlational method. 10

OR

- c) Give a brief account of experimental research method. 10
- d) What do you mean by sampling ? What is sampling size and sampling errors ? 10
- 3. a) What is reliability ? Discuss different methods of measuring reliability of a test. 10
- b) Differentiate between qualitative and quantitative research designs. 10

OR

[3]

- c) Discuss about various pretest and post test designs. 10
- d) Give an account of quasi-experimental design. 10
- 4. a) Give an account of different types of probability sampling techniques. 10
- b) Give an account of different types of non-probability sampling techniques. 10

OE

- c) Give a detailed account of construction of schedules and questionnaires in Psychological research. 10
- d) What are the various characteristics of a good psychological test ? 10

at $t = 0$, $y = y_0$

at $t = 0$, $\frac{dy}{dt} = 0$ 9

5. Where the relation $\frac{9}{Y} = \frac{3}{n} + \frac{1}{k}$
where the symbols have their usual meaning. 9

6. Define rigidity modulus and describe the static method to determine the modulus of rigidity of a wire. Derive the formula used. 2+3+4

7. Establish the equation of a damped harmonic oscillator and obtain the solution. Discuss the case of underdamped condition. 6+3

8. Explain the principle of launching of artificial satellite and derive the expression for orbital velocity of a satellite in an orbit. 4+5

9. State postulates of special theory of relativity. Write Lorentz transformation equations. Explain length contraction. 2+2+5

2018

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

1. Answer any **four** of the following :

a) What is triple product of vectors ? Mention the characteristics of vector triple product. 3+3

b) i) If $\vec{A} = 3\hat{i} + 4\hat{j} - 5\hat{k}$
 $\vec{B} = -\hat{i} + 2\hat{j} - 6\hat{k}$

Find $\vec{A} \cdot \vec{B}$ and $\vec{A} \times \vec{B}$. 3

ii) Prove : 3

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

c) What is centre of mass ? Show that in absence of external forces, the velocity of centre of mass remains constant. 2+4

[2]

- d) Explain the motion of rocket on the basis of conservation of linear momentum. 6
- e) i) Define Poissons ratio. Find the theoretical limiting values of Poisson's ration. 1+2
- ii) Calculate the extension of a steel wire of length of 4m and diameter 2 mm when loaded with a weight of 8 kg.
- $Y \text{ of steel} = 2 \times 10^{12} \text{ dyne/cm}^2$. 3
- f) Define work-energy principle. Discuss conservation of mechanical energy in free fall of a body. 2+4
- g) Discuss geosynchronous orbit. 6
- h) i) Explain 'moving clock runs slow'. 3
- ii) A spaceship A moves away from earth with speed $0.9C$. Another spaceship B is to pass at a relative speed of $0.6C$. Compute the speed of B relative to earth. 3

[3]

2. a) Let $\vec{r} = \vec{a} \cos wt + \vec{b} \sin wt$
 \vec{a}, \vec{b} are constant vectors
- Show that $\vec{r} \times \frac{d\vec{r}}{dt} = w(\vec{a} \times \vec{b})$
- $\frac{d^2\vec{r}}{dt^2} + w^2\vec{r} = 0$ 5
- b) Find the area of parallelogram determined by the vectors
- $\vec{a} = 3\hat{i} + 2\hat{j}$
- $\vec{b} = 2\hat{j} - 4\hat{k}$ 4
3. a) Discuss how a twobody problem can reduced to an equivalent one body problem. 4
- b) Prove that areal velocity of a particle moving under a central force is a constant. 5
4. Solve the differential equation
- $\frac{d^2y}{dt^2} + 2k\frac{dy}{dt} + w^2y = 0$
- where $2k$ and w^2 are constants, using the initial conditions

[2]

- iii) CO_2 has zero dipole moment while that of water is 1.84 D.
- d) Discuss the shapes of the following on the basis of VSEPR theory. 2×3
(i) XeF_4 (ii) PCl_5 (iii) SF_4
- e) Discuss the formation structure and stability of carbanions. $1\frac{1}{2} + 1\frac{1}{2} + 3$
- f) i) Define and explain electrophiles and nucleophiles with suitable examples of each. $2 + 2$
ii) Write resonating structures of nitrobenzene. 2
- g) i) Write a note on Wurtz reaction. 4
ii) What happens when vapours of ethylene are passed through the alkaline solution of KMnO_4 ? 2
- h) Discuss : $3 + 3$
i) Ozonolysis of ethene.
ii) Anti-Markownikoff's rule.
2. a) Write the postulates of Bohr's atomic Theory. What are its limitations? $5 + 2$

[3]

- b) How does Bohr's theory explain the stability of atom? 2
3. What are quantum numbers. Discuss different quantum numbers and give their significance. $1 + 8$
4. a) What is lattice energy? How can it be determined by using Born-Haber Cycle. Discuss with an example. $1 + 5$
b) Name the factors which influence the lattice energy. 2
c) What is meant by solvation energy? 1
5. a) Write the postulates of VSEPR Theory. 4
b) Draw the molecular orbital diagram for O_2 molecule. Calculate its bond order and predict its magnetic character. $3 + 2$
6. a) On the basis of hyper conjugation explain the stability and alkyl free radical. 3
b) Name and draw the Newmann projection formulae of two extreme conformations of ethane. 4

2. Give a general account of range of thallus structure in Algae 9
3. Discuss the genetic recombination in Bacteria. 9
4. Describe the reproduction in chlamydomonas. 9
5. Describe the life-cycle of Rhizopus. 9
6. Describe the morphology, anatomy and reproduction in Marchantia. 9
7. What is heterospory ? Give an account of heterospory in selaginella. 9
8. Describe the morphology and anatomy of aerial stem of Equisetum. 9
9. Describe the reproduction in pinus. 9

2018

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

1. Answer **four** of the following : 6 × 4
 - a) Economic importance of Bacteria
 - b) Structure of Bacteriophage
 - c) Economic importance of bryophytes with special mention of sphagnum.
 - d) Ovule of Cycas
 - e) Corraloid root of Cycas
 - f) Economic importance of algae
 - g) Asexual reproducton in penicillium
 - h) L.S. of capsule of Funaria.

3. Discuss the disorders due to deficiency of Vit-E and Vit-K. 9
4. Define Carbohydrate. Classify carbohydrates and write down their properties. 9
5. What is the importance of Calcium in our body ? What are the sources of calcium ? 9
6. Discuss the causes of obesity and write down the dietary and life-style modifications to combat obesity. 9
7. What do you mean by Diabetes mellitus ? Discuss its causes, symptoms and prevention through dietary modifications. 9
8. Describe waterborne diseases and their remedy. 9
9. How does food adulteration affect the health of a consumer. 9

2018

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

1. Write notes on any **four** of the following : 6 × 4
 - a) Synthetic drink
 - b) Essential amino acids
 - c) Co-Enzyme
 - d) Protein Energy Malnutrition
 - e) Alcoholism
 - f) Nutritional need of a pregnant woman
 - g) AIDS
 - h) Food spoilage.
2. Define nutrition. Describe dietary sources of different nutrients and their biochemical role. 9

- b) Prove that the equation : 6
 $4x^2 - y^2 + 2z^2 + 2xy - 3y^2 + 2x - 11y - 6z - 4 = 0$
7. a) Solve $\frac{dy}{dx} = \frac{x - y + 1}{x + y - 3}$. 6½
- b) Solve the I.V.P. $\frac{dy}{dx} + y = f(x)$, when
 $f(x) = \begin{cases} 2, & 0 \leq x < 1, \\ 0, & x \geq 1 \end{cases}$ 6
 $y(0) = 0$
- 8 a) Solve $p^2x^2 - 2xyp + 2y^2 - x^2 = 0$. 6½
- b) Solve by method of variation of parameter
 $(D^2 + 1)y = \sec x$ 6
9. a) Solve $xy'' - (2x - 1)y' + (x - 1)y = 0$ 6½
- b) Find the laplace transformation of $t^2 \cos bt$. 6

2018

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

1. Answer **four** of the following : 7½ × 4
- a) Find radius of curvature at origin by Newton's method to the curve
 $x = a(\theta + \cos\theta), y = a(1 - \cos\theta)$.
- b) Find asymptotes to the curve $x^3 + y^3 = 3axy$.
- c) Let $f(x, y) = \frac{x + y}{x - y}$ then discuss the existence of repeated limits and simultaneous limit at $(0, 0)$.
- d) Let $f(x, y) = \begin{cases} \frac{xy}{x^2 + y^2}, & (x, y) \neq (0, 0) \\ 0, & \text{otherwise} \end{cases}$

[2]

- e) A variable plane through a fixed point (a, b, c) cuts the co-ordinate axes in the points A, B, C show that the locus of the centres of the sphere OABC if $\frac{a}{x} + \frac{b}{y} + \frac{c}{z} = 2$.
- f) Prove and the plane $24x + 51y - 28z + 7 = 0$ touches the conicoid $12x^2 - 17y^2 + 7z^2 = 7$. Find the point of contact.
- g) Solve $y'' - ty' + y = 1$, $y(0) = 1$, $y'(0) = 2$ using Laplace transform.
- h) Find general solution of
- $$y^{(4)} - 4y^{(3)} + 8y^{(2)} - 8y' + 4y = 0.$$
2. a) Prove that the radius of curvature of the point $(-2a, 2a)$ on the curve $x^2y = a(x^2 + y^2)$ is $-2a$. 6½
- b) Find the asymptotes of the following curves $x^2y - 3x^2 - 5xy + 6y + 2 = 0$. 6
3. a) Trace the curve $x^{2/3} + y^{2/3} = a^{2/3}$. 6½

[3]

- b) Find the length of the curve
- $$x + a(t + \sin t)$$
- $$y = a(1 - \cos t), -\pi \leq t \leq \pi. \quad 6$$
4. a) Find the volume of the solid formed by the revolution of the limaçon $r = a + b \cos \theta$ ($a > b$) about the initial line. 6½
- b) Explain $x^2y + 3y - 2$ in powers of $x - 1$ and $y + 2$. 6
5. a) Find the maxima and minima of the function $f(x, y) = x^3 + y^3 - 3x - 12y + 20$. 6½
- b) If $u(x, y) = \sin^{-1} \left(\frac{x^2 + y^2}{x + y} \right)$ then find
- $$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}. \quad 6$$
6. a) Find the equation of the sphere circumscribing a tetrahedron bounded by the planes
- $$x = 0, y = 0, z = 0, x + y + z = 1. \quad 6½$$

2018

Full Marks - 40

Time - 2 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. a) Critically analyse Charles Lamb's "Dream Children". 7½

OR

What has Lynd to say on the mechanical civilization of modern times ?

- b) Answer any *three* of the following : $2\frac{1}{2} \times 3$
- i) What are the qualities of Lochimar described by the poet ?
 - ii) Why does the beautiful lady leave the knight at the cave ?
 - iii) Why do you think Wordsworth compared the Solitary Reaper's song to that of the nightingale ?
 - iv) Why is the poem 'Uphil' an allegory?

[2]

- v) What is the main idea of the poem "La Belle Dame sans Merci" ?
2. Write any **one** paragraph of the following : 7½
- College Election
 - Advantages of self-defence for women
 - Use of Smart-phones.
3. You are an e-learning professional. You are more than welcome to create your resume and increase your chances to get your dream job in the e-learning industry. 7½

OR

Write a report on smuggling of fake currency note.

4. Do as directed : 1 × 10
- I started in time. I arrived late.
(Make a compound sentence)
 - Write a complex-compound sentence of your own.
 - The dog lived in the garden and the cat inside it. (Make a simple sentence)

[3]

- iv) Write an adverbial sentence signifying how, when and where.
- v) The terrorists tried to *blow up* the railroad station.
(Use phrasal verb for 'blow up')
- vi) You _____ stop when the traffic lights turn red..
(should / must)
- vii) We are going on vacation _____ August.
(Use preposition)
- viii) Please put the vase _____ the table.
(Use preposition)
- ix) It was so big box that I can't lift it.
(Correct the Error)
- x) Mankind would love nature.
(Correct the Error)

୩. ଯେ କୌଣସି **ଅଠଟିର** ଅତିସଂକ୍ଷିପ୍ତ ଉତ୍ତର ପ୍ରଦାନ କର : ୧ × ୮

- କ) ଶ୍ରୀବ୍ୟ ଯୋଗାଯୋଗ ମାଧ୍ୟମର ଏକ ଉଦାହରଣ ।
- ଖ) ଇମେଲ୍ ଓ ଫ୍ୟାକ୍ସ ମଧ୍ୟରେ ପାର୍ଥକ୍ୟ ଦର୍ଶାଅ ।
- ଗ) ଯୋଗାଯୋଗରେ ବଳାଘାତର ଭୂମିକା ।
- ଘ) 'ଚୁକ୍ତିନାମା' କେଉଁଥିରେ ଲେଖାଯାଏ ?
- ଙ) ଷ୍ଟେବସାଇଲ୍ କ'ଣ ?
- ଚ) ଦୃଶ୍ୟ-ଶ୍ରୀବ୍ୟ ସଂଚାର କହିଲେ କ'ଣ ବୁଝ ?
- ଛ) ଜରୁରୀ ସାକ୍ଷାତ୍‌କାର କେତେବେଳେ ହୋଇଥାଏ ?
- ଜ) ରଣପତ୍ର କ'ଣ ବୁଝାଏ ?
- ଝ) ଗାଁ ନିଶାପ ।
- ଞ) "All India Radio" ନାମକରଣ କେବେ ହେଲା ?
- ଟ) ବୋଧଗମ୍ୟ ସରଳ ଭାଷ୍ୟ
- ଠ) ସାଧାରଣ ଯୋଗାଯୋଗ କାହା ସହିତ ସଂପର୍କୀକୃତ ?
- ଡ) ଶାରୀରିକ ଇଚ୍ଛିତ କହିଲେ କ'ଣ ବୁଝ ?
- ଢ) 'ସ୍ୱଗତ କଥନ' ଦ୍ୱାରା କିପରି ଯୋଗାଯୋଗ ହୁଏ ?

V-365-3.6



2018

Full Marks - 40

Time - 2 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

୧. ଯେ କୌଣସି **ଦୁଇଟିର** ଉତ୍ତର ପ୍ରଦାନ କର : ୧୨ × ୨

- କ) ଯୋଗାଯୋଗର ସଂଜ୍ଞା ପ୍ରଦାନ ପୂର୍ବକ ଏହାର ପ୍ରକାରଭେଦ ସଂପର୍କରେ ଆଲୋଚନା କର ।
- ଖ) ସାହିତ୍ୟ ମାଧ୍ୟମରେ କିପରି ଯୋଗାଯୋଗ କରି ହୁଏ ବୁଝାଅ ।
- ଗ) ସାକ୍ଷାତ୍‌କାର କଳାର ସ୍ୱରୂପ ଉଦ୍‌ଘାଟନ ପୂର୍ବକ ଏହାର ଉପଯୋଗିତା ସଂପର୍କରେ ଯାହା ଜାଣ ଲେଖ ।
- ଘ) ଦଳଗତ ଆଲୋଚନା କହିଲେ କ'ଣ ବୁଝ ? ଏହାର ବିଭାଗୀକରଣ କରିବା ସଂଗେ ସଂଗେ ବିତର୍କର ଫଳାଫଳ କିପରି ଆନନ୍ଦ ପ୍ରଦାନ କରିଥାଏ, ତାହା ଆଲୋଚନା କର ।

୨. ଯେ କୌଣସି **ଦୁଇଟିର** ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ପ୍ରଦାନ କର : ୪ × ୨

- କ) ଅବ୍ୟବସ୍ଥିତ ବିତର୍କ ଓ ସାମୟିକ ବିତର୍କ
- ଖ) ବୃତ୍ତିଗତ ସାକ୍ଷାତ୍‌କାର
- ଗ) ଆଜିକ ଓ ବାଚିକ ଯୋଗାଯୋଗ
- ଘ) 'ବିବରଣୀ' କହିଲେ କଣ ବୁଝ ? ଏହା କିପରି ଯୋଗାଯୋଗକୁ ପରିଚ୍ଛନ୍ନ କରିଥାଏ, ତାହା ଉଲ୍ଲେଖ କର ।

V-365

[Turn Over

3. Define indifference curve and describe its properties. 12½
4. SAC is U-shaped. Examine it. 12½
5. Describe the equilibrium of the firm and industry in the short run under perfect competition. 12½
6. State and explain the producers surplus under perfect competition. 12½
7. State and explain how a monopolist attains equilibrium both in short run and long run. 12½
8. Define oligopoly and describe its features. 12½
9. Explain Low price and output can be determined under monopolistic competition. 12½
10. What is Monopoly ? How monopoly is different from perfect competition. 12½

2018

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

1. Write notes on any **four** of the following : $7\frac{1}{2} \times 4$
 - a) Revenue curves under Perfect Competition.
 - b) Cross elasticity of demand
 - c) Income effect
 - d) Law of returns to scale
 - e) Expansion path
 - f) Horizontal and vertical Integration of firms.
 - g) Price line
 - h) $MRTS_{XY}$.
2. Define price elasticity of demand and describe different types of price elasticity of demand with diagram. 12½

2018

Full Marks - 40

Time - 2 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. किन्हीं **दो** प्रश्नों के उत्तर दीजिए : 10 × 2
- क) भाषा की परिभाषा बताते हुए मौखिक और लिखित भाषा में अंतर स्पष्ट कीजिए ।
- ख) व्यंजन की परिभाषा देते हुए इसका वर्गीकरण कीजिए ।
- ग) संप्रेषण किसे कहते हैं ? उसके प्रक्रिया पर संक्षेप में लिखिए ।
- घ) संप्रेषण क्या है ? उसके विभिन्न प्रकारों को संक्षेप में स्पष्ट कीजिए ।
2. क) किन्हीं **तीन** के दो-दो पर्यायवाची शब्द लिखिए : 1 × 3
- आकाश, गणेश, पवन, स्त्री, पुत्र ।
- ख) किन्हीं **तीन** के विलोम शब्द लिखिए : 1 × 3
- अनुराग, पूरस्कार, अल्पायु, हर्ष, अग्रज ।

[2]

- ग) किन्हीं **तीन** शब्दों के शुद्ध रूप लिखिए : 1×3
अनाधिकार, समाधी, बाबजुद, किजिए, फुल ।
- घ) किन्हीं **तीन** वाक्यों को शुद्ध कर लिखिए : 1×3
- हम खाना खा लिए हैं ।
 - उसका प्राण निकल गया ।
 - मैं मेरे घर में रहता हूँ ।
 - आप इधर बैठो ।
 - उसने मुझे बोला ।
- ङ) किन्हीं **चार** का एक-एक शब्द में लिखिए : 1×4
- जो कुछ नहीं जानता
 - जो देखा नहीं जाता
 - जिसका अंत नहीं हो सकता
 - पिता की बहन
 - जो जन्म से अंधा है
 - जो निशा में विचरण करता है
 - जो आसानी से मिलता है ।

[3]

- च) किन्हीं **दो** के अर्थ बताकर वाक्य में प्रयोग कीजिए : 2×2
- नाक कटना
 - अंधे की लाठी
 - नौ दो ग्यारह होना
 - अकल का दुश्मन
 - न रहेगा बाँस न रहेगी बाँसुरी ।

V-367-0.5



[2]

I-UG-Com(AECC)-I (ES)

- c) Give a brief account of alternate energy sources and their use.
- d) Describe the causes, effects and controlling measures and Air Pollution.

2018

Full Marks - 40

Time - 2 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

V-369-3.5



1. Write short notes on any *two* of the following : 7½ × 2
 - a) Ecological pyramid
 - b) Land degradation
 - c) Flood
 - d) Management of waste.

2. Answer any *two* of the following : 12½ × 2
 - a) Define ecosystem. Discuss the major components of an ecosystem taking forest as example.
 - b) Explain different methods of Conservation of Biodiversity.

[2]

- c) What is biodiversity ? Explain different levels of biodiversity. Add its values.
- d) Discuss the causes, effect and control measures of Water Pollution.

V-371-3.5



I-UG-ES(AECC)-I (Sc)

2018

Full Marks - 40

Time - 2 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. Write short notes on any *two* of the following : $7\frac{1}{2} \times 2$
 - a) Food chains
 - b) Renewable energy sources
 - c) Endangered species
 - d) Industrial waste.

2. Answer any *two* of the following : $12\frac{1}{2} \times 2$
 - a) What is ecosystem ? Describe the different components and functions of pond ecosystem.
 - b) Explain the causes and effects of deforestation.

V-371

[Turn Over

I-UG-BBA(AECC)-I (C.Eng)

2018

Full Marks - 40

Time - 2 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. Answer any *five* of the following : 3 × 5
- a) Verbal communication
 - b) Non-verbal communication
 - c) Barriers of communication
 - d) Difference between verbal and non-verbal communication.
 - e) Role of Body language in business communication.
 - f) Process of communication
 - g) Forms of communication
 - h) Concept of Business communication.

[2]

2. Answer any **two** of the following : 7×2
- a) You are a sales representative. Write a letter to Mr. S. Sharma of ABC Enterprises introducing one of your new products or services giving all important details about your product / service.
 - b) Write a report as a News Reporter about a witnessed road accident.
 - c) Write a job application to Managing Director Hero-India for the post of Marketing Executive.
 - d) Write a C.V. to list your work achievements, duties and responsibilities.

3. Do as directed : 1×11
- i) It pains me a lot. (Correct the error)
 - ii) He is senior _____ me. (Use preposition)
 - iii) He reaches school in time yesterday.
(Correct Tense)
 - iv) This is a beautiful picture. (Use question tag)
 - v) I eat rice. (Change voice)

[3]

- vi) Bread and butter (is/are) good for health.
(Use correct alternative)
- vii) I _____ walk 10 k.m. a day. (Use modal)
- viii) You (call) me, I (visit) you. (Use conditional)
- ix) This is a helpful book for all.
(Identify adjective)
- x) Terry always dresses beautifully.
(Use phrasal verb for 'dress')
- xi) Write synonym for the word 'Good'.

- ଟ) ସମୁଦ୍ର ମୋ ବଢ଼େଇକି କାହାପରି ତୁନା କରିଦେଲା ?
 ଠ) ଲୁହ ବୋହି ଯାଉଥିବା ଗାଈଟିଏ ପରି କିଏ ନଇଁ ପଡ଼େ ?

୨. କ) 'ଜୀବନ ଚିନ୍ତା' କବିତାର ଭାବ ବିଶ୍ଳେଷଣ କର । ୨୦

ଅଥବା

ଖ) 'ବ୍ୟଥିତ ପ୍ରାଣର ଅନ୍ତିମ ଅଶ୍ରୁ' କବିତାରୁ ପ୍ରେମର ମହତ୍ତ୍ୱ ପ୍ରତିପାଦନ କର ।

୩. କ) ପଠିତ କବିତା ଆଧାରରେ ଜାରା ଶବରର ଭକ୍ତି ଓ ଭାବନାର ଚିତ୍ର ଉପସ୍ଥାପନ କର । ୨୦

ଅଥବା

ଖ) ପ୍ରତୀକାତ୍ମକ କବିତା ଭାବରେ 'ଓଟ'ର ମୂଲ୍ୟାୟନ କର ।

୪. କ) 'ସମୁଦ୍ର ଓ ମୁଁ' କବିତାରେ ବ୍ୟକ୍ତି ଓ ପ୍ରକୃତିର କିପରି ମଧୁର ମିଶ୍ରଣ ଘଟିଛି ଆଲୋଚନା କର । ୨୦

ଅଥବା

ଖ) 'ଦେବକୀ' କବିତାରେ ପ୍ରତିଫଳିତ ମାତୃତ୍ୱର ମାର୍ମିକ ଅଭିବ୍ୟକ୍ତି ଉଲ୍ଲେଖ କର ।

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

୧. ଯେ କୌଣସି *ଦଶଟିର* ସଂକ୍ଷିପ୍ତ ଉତ୍ତର ଲେଖ : ୨×୧୦

କ) ଜୀବନ ସ୍ରୋତ କାହାକୁ ଭେଟିବାକୁ ଧାଉଁଛି ?

ଖ) କେଉଁ ସୁଧାମ ଲାଗି ଆତ୍ମା ସଦା ପିପାସିତ ?

ଗ) କେଉଁ ଦୁଇଟି ପ୍ରେମମୟଙ୍କ ପ୍ରେମ ପ୍ରଦାନ ?

ଘ) 'ଡରନି ମତେରେ ଡରନି ମୋତେ ରେ' - ବୋଲି କିଏ କାହାକୁ କହିଛି ?

ଙ) ମତୁ୍ୟର ଜଳେ ପହଁରି ପହଁରି କ'ଣ ଡୋଳିବା କଥା କୁହାଯାଇଛି ?

ଚ) ସମୁଦ୍ରର ଭଲ ଗୁଣ କ'ଣ ?

ଛ) ଚମ୍ପାଫୁଲ ମହକରେ କିଏ ବାଟ ଭୁଲି ଆସିଥିଲା ?

ଜ) କାହାକୁ ମରୁସାଗରର ଜୀବନ୍ତ ଜାହାଜ ବୋଲି କୁହାଯାଏ ?

ଝ) ବିନା ବାଧା, ବିନା ପ୍ରତିବାଦରେ ସବୁକିଛି ସହିବାର ଅନ୍ୟ ନାମ କ'ଣ ?

ଞ) କାହା ଛାତିରେ କୌସୁଭ ମଣି ଥାଏ ?

3. 'अँधेरे में' काव्य के मुख्य प्रतिपाद्य पर आलोकपात कीजिए । 20

अथवा

क) अँधेरे में कौन हैं ? उनका उद्धार कैसे संभव है ? 10

ख) 'असाध्य वीणा' की प्रतीकात्मकता को समझाइए । 10

4. निम्न प्रश्नों में से किन्हीं दश के संक्षिप्त उत्तर दीजिए : 2 × 10

क) 'साकेत' का क्या अर्थ है ?

ख) 'स्मृति' विरह-दशा का एक उदाहरण दीजिए ।

ग) क्या 'साकेत' में उर्मिला सिर्फ रोती धोती है ?

घ) 'चपल यौवन बाल' पद का सार क्या है ?

ङ) उर्वशी की क्या इच्छा है ?

च) पुरुरवा क्यों संतुष्ट नहीं हो पाता है ?

छ) क्यालज्जा रति की प्रतिकृति है ?

ज) 'पुलकित कदाम्ब की माला' किसका प्रतीक है ?

झ) राम 'पुरुषोत्तम नबीन' क्यों हैं ?

ञ) राम को निराश देखकर हनुमान के मन में क्या विचार आता है ?

ट) कारखाने की चिमनी कविको कैसा दिखाइ देता है ?

ठ) असाध्य वीणा के साथ काव्यकला का क्या साम्य है ?

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. 'साकेत' में वर्जित उर्णिला की विरहदशा का आकलन अपने शब्दों में कीजिए । 20

अथवा

क) साकेत महाकाव्य लिखन के मुख्य उद्देश्योंको स्पष्ट कीजिए । 10

ख) 'उर्वशी' के प्रेमदर्शन की समीक्षा कीजिए । 10

2. 'लज्जा' सर्ग के मुख्य भावों का सार लिखिए । 20

अथवा

क) लज्जा नारी के जीवन के लिए क्यों आवश्यक है, समझाइए । 10

ख) 'रामकी शक्तिपूजा' में शक्ति की मौलिक कल्पना कैसे की गई है, चर्चा कीजिए । 10

- b) Discuss spinor transformation under rotation and hence show that spin has no classical analog. 10

OR

- c) Write down the relevant commutation relations for angular momentum operator $\vec{J} = (J_x, J_y, J_z)$ and solve the eigen value problem for J^2 . 10
- d) What are C.G. Co-efficients ? Obtain the C.G. Co-efficients for angular momentum states with $J_1 = 1$ and $J_2 = \frac{1}{2}$ 10

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2018

Full Marks - 80

Time - 3 Hours

The figures in the right hand margin indicate marks

Answer *all* questions

1. Answer any *ten* of the following : 2×10
- If \hat{A} and \hat{B} are hermitian operators with $[\hat{A}, \hat{B}] = \hat{c}$ then prove that \hat{c} is hermitian.
 - Derive position operator in momentum representation.
 - Derive expansion theorem from closure relation in a given basis.
 - Define scalar product of vectors and mention its properties.
 - Show that time evolution operator is unitary.
 - Derive the equation of motion in the Heisenberg picture.

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[Turn Over

[2]

- g) Show that $[L_+L_-] = 2\hbar L_z$
- h) Evaluate $[L_z, L^2]$
- i) Derive matrix for the operator J_z for $j = \frac{3}{2}$
- j) What is a density matrix ?
- k) Prove that $\sigma_i\sigma_j + \sigma_j\sigma_i = 2\delta_{ij}$
- l) How many number of C.G. Co-efficients are required for addition of two spin states with $l = \frac{1}{2}$
2. a) Let $\phi_1, \phi_2, \dots, \phi_n$ represent a set of linearly independent eigen functions corresponding to a degenerate state. Construct appropriate linear combinations so that the given eigen functions form an orthonormal set. 10
- b) Deduce the uncertainty relation using non commutativity of the operators. 10

OR

[3]

- c) Explain the concept of finite and infinite dimensional complex linear vector space in quantum mechanics with examples. 10
- d) Show that the operator that implements finite translation is unitary. Discuss the physical significance of this result. 10
3. a) Use the operator method to obtain energy eigen values and eigen vectors of 1D harmonic oscillator. 10
- b) Obtain time dependence of raising, lowering and Hamiltonian operators in 1-D Harmonic oscillator. 10
- OR
- c) Show that angular momentum operator are generators of rotation. 10
- d) obtain matrix representation for operators L_z, L_+ and L_- for $l = 1$. 10
4. a) Obtain eigenvalues and eigenfunctions of the Pauli spin matrix σ_z . 10

2. रस की निष्पत्ति कैसे होती है, विस्तारसे समझाइए । 20

अथवा

क) साधारणीकरण क्या है ? 10

ख) काव्यके प्रयोजन क्या क्या है ? 10

3. 'काव्य शोभाकरान् धर्मान् अलंकारान् प्रचक्षते' - इस सिद्धांत को व्याख्या कीजिए । 20

अथवा

क) रीति क्या है ? गुणोंसे उसका क्या संबंध है ? 10

ख) अर्थालंकार की अवधारणाको स्पष्ट कीजिए । 10

4. ध्वनि सिद्धान्त की सम्यक् समीक्षा कीजिए । 20

अथवा

क) शब्दशक्तियों को उदाहरण समझाइए । 10

ख) वक्रोक्ति के मुख्य भेदों पर प्रकाश डालिए । 10

2018

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. निम्न प्रश्नों में से किन्हीं दशके संक्षिप्त उत्तर दीजिए : 2 × 10

क) 'शब्दार्थी काव्यम्' - समझाइए ।

ख) 'प्रतिभा' कैसे काव्य का हेतु है ?

ग) काव्य का मुख्य प्रयोजन क्या है ?

घ) 'अनुभाव' क्या है ?

ङ) लक्ष्यार्थ और वाच्यार्थ का क्या संबंध है ?

च) 'अलंकार' शब्द का क्या अर्थ है ?

छ) एक शब्दालंकार का उदाहरण दीजिए ।

ज) अलंकार काव्य का शोभा को कैसे बढ़ाते हैं ?

झ) 'रूपक' का क्या अर्थ है ?

ञ) वक्रोक्ति किसे कहते हैं ?

ट) काकु वक्रोक्ति का एक उदाहरण दीजिए।

ठ) 'स्फोट' क्या है ?

ग) पठितांशमाधारेण गीतायाः वैशिष्ट्यं लिखत ।

घ) संस्कृतेन अनुवादं कुरु :

गीता हिन्दु दर्शनर जातान् प्रसिद्धि असे । अरविन्दक
पठरे उगवद् गीता पृथवर प्रु यर्गुळारु अयुक्त
पुढावशाक असे । एहा पहाडारतर उाषुपर्वरे अङ्गि ।
शकर एहाकु गीतागजा कहिळ्ळि । गीता अयमन पशिषर
ळ्ळुगळ्ळि कु वृद्धि कराव ।

Gita is the national property of Hindu Philosophy. According to Arabindo the Bhagavat Gita is the most powerful of all religious scriptures of the world. It exists in the Bhisma Parva of the Mahabharata. Sankara says, it is Gitaganga. The study of Gita develops the will power of man.

2018

Full Marks - 40

Time - 2 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. अधोलिखितेषु द्वयोः प्रश्नयो उत्तरं लिखत : 7½ × 2

क) कठोपनिषदि रथरूपकस्य दार्शनिकतत्त्वं विशदयत ।

ख) जीवः कथं मृत्युमुखात् प्रमुच्यते ?

ग) इन्द्रियाणि वलात् किं हरति ?

घ) व्याख्यां कुरु :

विहायकामान् चः सर्वान्

पुमांश्चरति निःस्पृहः ।

निर्ममो निरहङ्कारः ।

स शान्तिमधिगच्छति ॥

2. अधोलिखितेषु द्वयोः उत्तरं लिखत : 12½ × 2

क) कठोपनिषदि वर्णितस्य आत्मतत्त्वस्य सारं वर्णयत ।

ख) कः स्थितप्रज्ञः ? कथं तस्य प्रज्ञा प्रतिष्ठिता ?