

**IV-UG-Phy(H)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Determine the modulus of rigidity of the given wire using Maxwell's needle. 15  
OR
  - b) Determine the resolving power of the given telescope.  
OR
  - c) Compare the given two resistances using C F bridge.  
OR
  - d) Calibrate the given source of light  
OR
  - e) Determine the Cauchy's constants.  
OR
  - f) Determine the cubical expansion of the given liquid using Sinkers.
2. Viva-Voce. 6
  3. Record. 4

V-14-0.5 □□

**VI-UG-Edn(H)-XIV (Pract)**

**2016**

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is Action Research in Education ?  
Write down the scope and procedure Action Research. 20  
OR
  - b) Write down the purpose of action research in Education. What are the tools used in Action Research explain.
3. Preparation and Maintenance of Record. 10
  4. Viva-Voce. 10

V-1-0.5

□□

**Afternoon Session**

4. Demonstrate experimentally the phenomenon of 'Negative Transfer of Training' with the help of mirror tracing apparatus. 10

OR

Assess the level of adaptation and coping skill of the 'self' by using 'Adaptation' questionnaire and 'coping' checklist. 10

OR

Determine the creative ability of children selected from Class-VIII by using 'Teacher's' rating of children's creativity scale. 10

5. Viva-Voce. 6
6. Record. 4

V-2-0.5

**2016**

Full Marks - 40

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions from both sessions**Morning Session**

1. Experimentally find out the recognition score of your subject for nonsense syllables under similar and dissimilar context. 10

OR

Assess the quality of the home environment of upper KG child by home observation and parent interview using 'HOME' scale 10

OR

Find out experimentally the serial position effect of materials in learning a list of Nonsense syllables by the method of anticipation and prompting. 10

2. Viva-Voce. 6
3. Record. 4

V-2

[Turn Over

[ 2 ]

Draw the static characteristics of the given transistor in CE mode.

OR

Determine the ballistic constant of the Ballistic Galvanometer by Hebert's magnetic standard.

OR

Draw the characteristic curve of a Zener diode.

- |               |    |
|---------------|----|
| 2. Viva-voce. | 12 |
| 3. Record.    | 8  |

V-3-0.5



**VI-UG-Phy(H)-XIV (Pract)**

**2016**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the Young's modulus of the given wooden beam by vibration cantilever. 30

OR

Determine the surface tension of mercury by Quinck's method.

OR

Determine the resolving power of grating.

OR

Draw the static characteristics of a triode valve.

OR

Determine the coefficient of viscosity of a high viscous liquid by Searl's method.

OR

[ 2 ]

***Mark distribution for Q1***

General working	06
Result	18
Calculation	06

V-4-0.5



**VI-UG-Chem(H)-XIV (Pract)**

**2016**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer ***all*** questions

1. Determine the rate constant of hydrolysis of ethyl acetate in presence of conc. HCL using NaOH solution of strength \_\_\_\_\_ . 30

OR

Determine the distribution coefficient of iodine between water and carbontetrachloride.

OR

Estimate the amount of  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ion in the supplied solution by EDTA Titrations. Strength of EDTA solution is \_\_\_\_\_.

2. Viva-Voce. 12
3. Records 8

- c) Submission of Economic important plant products. 3
- d) Submission of permanent slide. 2
6. Viva-Voce. 6
7. Class Record. 3

V-5-0.5

**2016**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Dissect, draw and describe in technical terms the specimen 'A' and 'B'. Underline the diagnostic characters. Write floral formula, draw floral diagram. Identify the genus and species. 9 + 9
2. Make permanent preparation of specimen 'C'. Identify and comment on its anomalous characters. 6
3. Identify on spot :  
Write the Botanical name and family name of supplied specimen 'D' and 'E'. 3
4. Write the Botanical name and economic importance of the following specimen 'F' and 'G'. 2 × 2
5. a) Submission of field study note. 2  
b) Herbarium collection (25 minimum) 3

3. Perform any **two** of the biostatistical experiments/solve the biostatistical problems as per the instruction of examiners.  $5 \times 2$
4. Identify the comment upon the spots 4(i) to 4(v) (5 spots shall be set from Economic Zoology)  $5 \times 2$
5. Records and Sessional preparations. 5
6. Viva-Voce. 5

V-6-0.5



## VI-UG-Zool(H)-XIV (Pract)

### 2016

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

Give labelled diagram wherever necessary

1. Conduct any **one** of the following physiological experiment as per the instruction of the examiner. 15
  - a) RBC count in man/mammal
  - b) Estimation of Haemoglobin of man/mammal
  - c) Preparation of haemin crystals from mammalian blood.
  
2. Conduct any **one** of the following biochemical experiment as per the instruction of the examiner. 10
  - a) Validation of Beer-Lambert's Law using colorimeter
  - b) Determine the absorbance maxima of Bromophenol blue.

[ 2 ]

3. a) Write a Visual Basic program to simulate a calculator. 10

OR

- b) Write a Visual Basic program to place a list box, text box and command buttons add, remove and exit on a form. The text entered in the text box should be added to the list box when the add button is clicked, removed from the list box button should terminate the application.

4. Record. 8

5. Viva-Voce. 12

V-7-0.5



**VI-UG-C.Sc(H)-XIV (Pract)**

**2016**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Write a program in 'C' to sort an array using quicksort. 10

OR

- b) Write a program in 'C' to sort a list of integers using heap sort 10

OR

- c) Write a program in 'C' to find the longest common sequence between two given string. 10

2. a) Write a 'C' program to search a pattern in a given string. 10

OR

- b) Write a 'C' program to insert a new node in a binary search tree and display it. 10

OR

- c) Write a 'C' for Depth First Search. 10

V-7

[Turn Over

**GROUP - B**

10

6. Write a 'C' program to compute  
Sum = 1 + 2! + 3! + 4!.....+ n!
7. Write a 'C' program to check the given number is Armstrong number or not.
8. Write a program to find the standard deviation of n numbers.
9. Write a 'C' program to swap two number using pointer.
10. Write a program to create a structure student containing roll, name and address accept values for the data members and display all the informations.

***Scheme of Valuation***

Record	10
Viva	20
Experiment	06



**2016**

Full Marks - 80

Time - 6 Hours

The question are of equal value  
Answer any **two** question from Group-A  
and any **three** from Group-B

**GROUP - A**

1. Trace the curve  $y^2(2-x) = x^3$ .
2. Trace the cycloid curve  $x = 2(\theta + \sin \theta)$ ,  $y = 2(1 + \cos \theta)$
3. Solve the differential equation  $\frac{dy}{dx} = x + y$ ;  $y(0) = 1$
4. Find the Lagrange's interpolating polynomial using the following data
 

x	0	1	3
f(x)	1	3	55
5. Find the value of  $\sqrt{2}$  using Newton's Raphson method upto five iteration.



**IV-PG-Phy-XVIII (Pract)**

**2016**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Determine the Velocity of ultrasonic waves in different medium using ultrasonic interferometer. 30

OR

- b) Study the velocity of ultrasonic waves of various liquids at different temperatures.

OR

- c) Determine the Concentration of supplied unknown solution using spectrophotometer

OR

- d) Determine the magnetic susceptibility by Quink's method.

OR

- e) Study the dispersion relation of a diatomic lattice.

2. Viva-Voce. 12

3. Record. 8



**IV-UG-Zool(H)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

*Draw labelled diagrams wherever necessary*

1. Perform any one of the following experiment as per the instructions of the examiner 7

- a) Study the life history of Frog.  
b) Dissection of Pituitary gland of Chick.

2. Identify and comment upon the Spots 2(i) to 2(vi) with reasons.  $1\frac{1}{2} \times 6$   
(03 microscopic slides of frog/chick development and 03 microscopic slides of mammalian endocrine glands).

3. Identify A, B, O blood group / Rh factor of human blood (preferably of own blood). 3

4. Practical Record and Sessional preparation. 3

5. Viva-Voce. 3



2. Write a PL/SQL program to swap two numbers without using intermediate variable. 2.5

OR

Write a PL/SQL program to multiply two numbers without using multiplication operator (\*).

3. Create and invoke a procedure QUERY\_EMP to query a particular EMP record whose employee code is passed as parameter. 2.5

OR

Create and invoke the RETURN\_SAL function to return the salary of an employee to a host variable. Pass the employee code as parameter.

4. Write a PL/SQL program to create a cursor to retrieve the EMP table details of those employees whose department number is passed as parameter and display those employee details. 5

OR

Create a package named Arithmetic for performing all arithmetical operation (+, -, \*, /) and test all the operation.

5. Record. 04
6. Viva-Voce. 06

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write the SQL commands for the following : 5
- Display the employee name for all employees who have an 'A' in their name of the EMP table.
  - Create a query that will display the employee name and commission amount. If the employee does not earn commission put "No Commission". Label the column. COMM.
  - Create a STUDENT table based on the following table structure.

ROLL	NUMBER	2	PRIMARY KEY
FIRST_NAME	VARCHAR2	10	NOT NULL
LAST_NAME	VARCHAR2	10	
DOB	DATE		

    - Insert few records.
    - Add a new column PHONE in the above table.
    - Remove the table from the database.

**IV-UG-Bot(H)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

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

1. Make a permanent preparation of the supplied specimen 'A'. Draw labelled diagram. Comment and identify with reasons. 6
2. Make a permanent preparation of the supplied specimen 'B'. Draw labelled diagram and identify with reasons. 6
3. Identify on spot C, D, E and F with labelled diagrams and reasons. (Each spotting 3 minutes). 4
4. Prepared slides. 2
5. Viva-Voce. 5
6. Class Record. 2



**IV-UG-Chem(H)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

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

1. a) Estimate the amount of aniline supplied to you in Bottle No \_\_\_\_\_. You are supplied with a solution of Sodium Thiosulphate of strength \_\_\_\_\_ 15  
OR  
b) Estimate the amount of phenol supplied to you in Bottle No \_\_\_\_\_. You are supplied with a solution of Sodium Thiosulphate of strength \_\_\_\_\_  
OR  
c) Prepare and submit 10g of aspirin.  
OR  
d) Prepare and submit 7g of Picric Acid.
2. Viva-Voce. 6
3. Record. 4



**IV-UG-Zool(P/EL)-VIII (Pr act)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

*Draw labelled diagrams wherever necessary*

1. Conduct any one of the ecological experiments as per the instruction of the Examiners. 8
  - a) Study of an aquarium simulating a fresh water pond eco-system
  - b) Estimation of dissolved Oxygen concentration in water by modified Winkler's method.
  - c) Determination of % of Organic compound of soil samples.
2. Identify and comment upon the Spots 2(i) to 2(vi) with comments. (6 spots i.e 2 from Dev. Biology, 2 from Resource biology and Economic Zoology and 2 from Endocrinology shall be set).  $1\frac{1}{2} \times 6$
3. Perform the biostatistical experiment / solve the biostatistical problem as per the instruction of the examiner. 3
4. Practical Record and Sessional preparation. 2
5. Viva-Voce. 3



**IV-UG-Phy(P/EL)-VIII (Pr act)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Determine the rigidity modulus of the given wire by dynamic method. 15  
OR  
b) Compare the emfs using potentiometer.  
OR  
c) Determine the wavelength of the monochromatic source using Newton's ring.  
OR  
d) Determine the angle of the prism and angle of minimum deviation using spectrometer.  
OR  
e) Verify the laws of transverse vibration of string by Sonometer.
2. Viva-Voce. 6
3. Record. 4



**IV-PG-Com-XVII (FM)**

**SIA-2016**

Full Marks - 10

Time - 1 Hour

The questions are of equal value

Answer any *one* question

1. Discuss various sources of working capital for an industrial undertaking. 10
2. Describe in detail the "MM-hypothesis" model of dividend. 10

V-38-1



**IV-UG-Chem(P/EL)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Estimate the amount of  $\text{Cu}^{2+}$  present in the supplied solution. You are given  $\text{K}_2\text{Cr}_2\text{O}_7$  solution of strength \_\_\_\_\_ 15  
OR  
b) Estimate the total iron present in the supplied solution. You are given  $\text{K}_2\text{Cr}_2\text{O}_7$  solution of strength \_\_\_\_\_  
OR  
c) Estimate the amount of phenol/aniline present in the supplied solution. You are supplied with a solution of sodium thiosulphate of strength \_\_\_\_\_

2. Viva-Voce. 6
3. Record. 4

V-21-0.5



**IV-UG-Psy(H)-VIII (Pract)**

**2016**

Full Marks - 20

Time - 6 Hours

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

1. a) Experimentally find out the discrepancy between the level of aspiration and the level of achievement of your subject. 10

OR

- b) Assess the intelligence level of your subject administering Raven's Standard Progressive Matrices (RSPM) test

OR

- c) Compare experimentally the subject's memory for associated and unassociated pair of words by the method of anticipation and prompting.

2. Record. 4

3. Viva-Voce. 6

**IV-UG-Edn(H)-VIII (Pract)**

**2016**

Full Marks - 20

Time - 6 Hours

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

1. a) What is Educational Survey ? Describe the methods of writing a report on Educational Survey 10

OR

- b) What is the importance of Educational Survey ? Write down the objectives and methodology on any one of the areas of Educational Survey assigned to you.

2. Preparation and maintenance of Record. 5

3. Viva-Voce. 5

[ 2 ]

- g) Compare the water uptake of starchy, oily and proteinaceous oily seeds.
2. Study the morphology and anatomy of the specimen 'A'. Comment on its ecological adaptation and identify with reasons. 6
3. Identify on spot the specimen 'B' and 'C' with labelled diagrams and reasons. 3
4. Viva-Voce. 4
5. Class Record. 2

V-22-0.5



**IV-UG-Bot(P/EL)-VIII (Pract)**

**2016**

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 experiment chosen by Lot : 10
- a) Determine the O.P. of the cell-Sap of the given specimen by plasmolytic method.
- b) Determine the D.P.D of a suitable storage tissue.
- c) Determine the resistance offered by the cuticle to loss of water in a fleshy xerophyte.
- d) Compare the rate of transpiration and absorption of any twig.
- e) Determine the rate of photosynthesis of any aquatic plant in different wavelengths of light.
- f) Study the effect of different known concentration of CO<sub>2</sub> on rate of photosynthesis of a hydrophyte.

**IV-UG-Geol(H)-VIII (Pract)**

**2016**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the sedimentary rocks ( $S_1$  to  $S_2$ ) megascopically. 2
2. Identify the sedimentary rocks ( $S_3$  to  $S_4$ ) microscopically. 3
3. Complete the outcrop. (map to be given the time of examination). 3
4. Draw a suitable geological section and interpret the structures of the geological map (map to be given the time of examination). 6
5. Solve the structural problem (problem to be given the time of examination). 3
6. Lab Record and Viva-Voce. 3
7. Field Report. 5



**IV-UG-Anthro(H)-VIII (Pract)**

**2016**

Full Marks - 20

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Take the following craniometrical measurements of the given skull and write down the landmarks, instruments and procedure adopted for that purpose.  $2 \times 3$ 
  - a) Basion-Bregma Height
  - b) Maximum cranial Breadth
  - c) Parietal chord.
2. Take the following measurements of the given mandible. Write down the procedures and landmarks.  $2 \times 2$ 
  - a) Bycondylar breadth
  - b) Mandibular length.
4. Practical Record 4
5. Viva-voice. 6





- c) Fit a Poisson distribution to the following data and test the goodness of fit.

X:	0	1	2	3	4	5	6
f:	275	72	30	7	5	2	1

- e) Evaluate  $\int_0^6 \frac{dx}{1+x^2}$   
 by using Trapezoidal rule, Simpson's  $\frac{1}{3}$  rule, Simpson's  $\frac{3}{8}$  rule, Weddle's rule and compare the result with its actual value, 3

2. Viva-Voce. 3  
 3. Record. 2

V-13-0.2



2016

Full Marks - 20

Time - 6 Hours

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

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

- a) Below are given the gain in weights (in lbs) of pigs fed two diets A and B.

*Gain in Weight*

Diet A : 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25

Diet B : 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22

Test if the two diets differs significantly as regards their effect on increase in weight.

- b) Two random samples drawn from two normal populations have the variable values as below.

Sample I : 19 17 16 28 22 23 19 24 26

Sample II : 28 32 40 37 30 35 40 28 41 45 30 36

Obtain the estimate of the variance of the population and test wheather the two population have the same variance.

**II-UG-Edn(H)-IV (Pract)**

**2015**

Full Marks - 20

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Verification of Practice Teaching Records : 5
  - a) Preparation of ten lesson plans and delivery.
  - b) Ten teaching aids pertaining to ten lesson plans delivered. Evaluate as a whole.
2. Performance in classroom teaching in final lesson plan (delivery of one lesson):
  - a) Lesson plan. 4
  - b) Classroom Management and Transaction. 4
  - c) Personality. 2
3. Use of Teaching aids :
  - a) Quality of teaching aid. 2
  - b) Appropriateness of aids. 2
  - c) Use of aids during delivery of lesson. 1



**VI-UG-Chem(H)-XIV (Pract)**

**2015**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Find out the value of the rate constant for acid hydrolysis of methyl acetate with 0.5N HCL at room temperature using standard NaOH solution of strength \_\_\_\_\_ and show graphically that the reaction follows first order Kinetics. 35

OR

Determine the partition coefficient of iodine between water and  $\text{CCl}_4$  using standard  $\text{Na}_2\text{S}_2\text{O}_3$  solution of strength \_\_\_\_\_.

OR

Estimate the amount of Calcium and Magnesium present in the supplied mixture solution of their salts using 0.01M EDTA solution.

2. Viva-Voce. 10
3. Records 5



[ 2 ]

- g) Study the effect of different temperatures on the rate of photosynthesis of a hydrophyte.
- h) Compare the rate of water uptake in a starchy, proteinaceous and oily seeds.
2. Study the morphology and anatomy of the specimen 'A'. Comment on its ecological adaptation and identify with reasons. 6
3. Identify on spot the specimen 'B' and 'C' with labelled diagrams and reasons. 3
4. Class Record. 2
5. Viva-Voce. 4

V-18-0.5



**IV-UG-Bot(P/EL)-VIII (Pract)**

**2015**

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 experiment chosen by Lot : 10
- a) Determine the Osmotic pressure of the cell Sap of the given specimen by plasmolytic method.
- b) Determine the diffusion pressure deficit of a suitable storage tissue.
- c) Determine the resistance offered by the cuticle to loss of water in a fleshy xerophyte.
- d) Compare the rate of transpiration and absorption of any twig.
- e) Determine the rate of photosynthesis of any aquatic plant in different wavelengths of light.
- f) Study the effect of known concentration of CO<sub>2</sub> on rate of photosynthesis of a hydrophyte.

## II-PG-Phy-IX (Pract)

**2015**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Study the static and dynamic characteristics of a triode valve. 30

OR

Draw the characteristics of a PNP/NPN transistor in CE mode.

OR

Draw the characteristics of a PNP/NPN transistor in CB mode.

OR

Study the triode as an amplifier.

OR

Study the transistor as a single phase amplifier.

OR

Study the Hartley Oscillator.

OR

Determine the bandgap of the given junction diode.

OR

Draw the characteristics of a zenor diode.

OR

Study the rectifier using different filter.

2. Viva-Voce. 12

3. Record. 08

V-38-0.3



## IV-PG-Phy-XVIII (Pract)

**2015**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the heat capacity using heat capacity kit. 30

OR

Determine the effective 'g' using E.S.R. apparatus.

OR

Determine the magnetic susceptibility by Quink's method.

OR

Determine the magnetic susceptibility by Groy's method.

OR

Determine the magneto resistance of different magnetic material by Fore Probe method.

2. Viva-Voce. 12

3. Record. 8

V-36-0.3



[ 4 ]

**GROUP - F**

21. Viva-Voce. 20

22. Record. 10

V-8-0.5 □□

**IV-UG-Math(H)-VIII (Pract)**

**2015**

Full Marks - 80

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *one* question from each Group of Group-A to E. Group-F is compulsory

**GROUP - A** 10

1. Trace the curve  $x^3 + y^3 = 6xy$ .
2. Trace the curve  $y^2(2-x) = x^3$ .
3. Trace the curve  $x^{2/3} + y^{2/3} = 4$
4. Trace the curve  $x = 2(t + \sin t)$ ,  $y = 2(1 + \cos t)$

**GROUP - B** 10

5. Find a real root of the equation  $x^3 - 8x - 4 = 0$  correct to 5 decimal places.
6. Find the smallest positive real root of the equation  $x^3 - x - 1 = 0$  correct to 5 decimal places using Secant method.

[ 2 ]

7. Find a positive real root of the equation  $x^3 + x^2 - 1 = 0$  correct to 7 decimal places using fixed point iteration method.
8. Find a positive real root of the equation  $xe^x = 1$  correct to four decimal places using Regula falsi method.

**GROUP - C**

10

9. Find the approximate value of  $e$  correct to 7 decimal places using Maclaurin's series.
10. Determine the value of  $\pi$  correct to two decimal places using Stirling formula.
11. Find the number of primes  $\leq 200$  using Seive method.
12. Solve the initial value problem

$$\frac{dy}{dx} = x + y, \quad y(0) = 1$$

by Euler's method and find  $y(1)$  with  $h = 0.1$ .

[ 3 ]

**GROUP - D**

10

13. Write a program in C to find the roots of a quadratic equation  $ax^2 + bx + c = 0, a \neq 0$ .
14. Write a program in C to find the sum of the digits of a number.
15. Write a program in C to check whether a number is a palindrome or not.
16. Write a program in C to find the sum of the series.

$$1 + \frac{x^2}{2} + \frac{x^3}{3} + \dots + \frac{x^n}{n}$$

**GROUP - E**

10

17. Write a program in C to multiply two matrices A and B of orders  $3 \times 3$ .
18. Write a program in C for arrangement of numbers in ascending order.
19. Write a program in C to find the factorial of a number using recursion.
20. Write a program to swap 2 numbers using pointer.

[ 2 ]

**II-PG-Phy-X (Pract)**

Solve a quadratic equation after writing the suitable programme.

OR

Solve a second order differential equation by Runge-Kutta method.

OR

Solve a cubic equation.

2. Viva-Voce. 12

3. Record. 8

V-39-0.3



**2015**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. Study the given power supply. 30

OR

Calibrate the given CRO.

OR

Verify the truth tables for different GATE circuits.

OR

Solve linear simultaneous equation after writing down the necessary programme.

OR

Generate and print the sum of the first 100 prime numbers.

OR

Find the sum of an AP/GP series.

OR

**II-PG-Com-X (CAB)**  
(Practical)

**2015**

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) How will you insert horizontal page break and vertical page break while printing a worksheet in EXCEL ? 8
- b) What is a range ? How are cell ranges named ? What are the advantages of assigning a name to a cell or a range of cells ? Can you rename a range or delete a range ? 8.6

OR

- c) How can you insert a graphic image into a word document ? 5
- d) Write the steps involved to go to a particular page directly in multi-page document ? 5
- e) How can you create a new template based on an existing template ? 6.6



[ 2 ]

2. a) How to copy a slide from one presentation to another ? Write all the steps. 5
- b) How text and graphics objects are animated in a slide ? Write all the steps. 5
- c) Write a program to calculate and display sum of series 5, 10, 15, ..... 100 in FoxPro. 6.6

OR

- d) How to create a table using Database view ? Write all its steps. 5
- e) What is Form-Wizard ? How can you create a form using Form-Wizard ? Write all its steps. 6.6
- f) Write a program in FoxPro to find out factorial of a input number. 5

3. Company starts a new scheme for his retail customers. According to the scheme company maintain a price list as follows. You have to create two prices Level: WHOLESALE and RETAIL. 16.6

[ 3 ]

Maintain price list for Retailer :

<i>Product</i>	<i>Quantity</i>	<i>Rate</i>	<i>Discount</i>
Ponds Cream	< 10	45/-	2.5%
	< 25	45/-	3.5%
	< 50	45/-	4.5%
	> 50	45/-	6%
Lotus Cream	< 15	90/-	2%
	< 25	90/-	3.5%
	> 25	90/-	5%

OR

What is meant by Ledger ? How can you create a single and a multiple ledger ? Create a single ledger of your own. 16.6

2015

Full Marks - 60

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Give an account of Sommerfield's extension of Bohr's theory of hydrogen atoms. 6
- b) Discuss L-S and J-J coupling scheme for two electrons atoms. 3+3

OR

- a) Define orbital and spin angular momenta of an atom. 1+1
  - b) Give the explanation of normal Zeeman effect on classical theory and obtain an expression for Zeeman shift. 4+6
2. a) Describe Moseley's work on X-rays. State Moseley's law. What is its importance? 2+1+2
  - b) Discuss Laue's theory for X-ray diffraction. 7

OR

[ 2 ]

- a) Distinguish between X-rays emission spectra and X-rays absorption spectra. 4
- b) Discuss the origin and mechanism of production of characteristic X-ray spectra. Give the theory of X-ray diffraction in detail. 2+2+4
3. a) Obtain an expression for rotational energy levels of a diatomic molecule and the frequency of rotational spectra. 6+3
- b) Show that in rotational spectra, the energy levels are not equally spaced. 3

OR

What is Raman effect ? What are Stoke's and anti-Stoke's lines in Raman spectrum ? Give the experimental set up to study Raman effect with the help of a neat labelled diagram. 2+2+2+5+1

4. a) Give various assumptions made for liquid drop model of the nucleus. Explain salient features of this model. 2+4
- b) Obtain an expression for the binding energy of a nucleus in the ground state based on an semi-empirical mass formula and justify dependence of different energy terms on various factors. 3+3

OR

[ 3 ]

Write explanatory notes on the following with example : 6 × 2

- i) Nuclear fusion reaction
- ii) Nuclear fission reaction.
5. a) Explain clearly the meaning of isospin and strangeness. In what respect are these important in the classification of elementary particles ? 2+2+2
- b) How many possible quarks are there ? Give the charge and strangeness numbers associated with each quark. How do quarks combine to form baryons and mesons ? 2+2+2

OR

Give the principle, construction and working of a linear particle accelerator. State some of its uses in modern science. 10+2

**2016**

Full Marks - 50

Time - 2 Hours

The questions are of equal value

Answer any *four* questions

5. What is conservation of biodiversity ? Describe the different methods of conservation of biodiversity.
6. Write notes on any *two* of the following :
  - a) Integrated pest management
  - b) Organic farming
  - c) Biofertilizer
  - d) Resource management.
7. Describe, briefly the Environmental Protection Act and Wild Life Protection Act.
8. Write notes on any *two* of the following :
  - a) Water Act
  - b) SPCB (State Pollution Control Board)
  - c) Air Act
  - d) Environmental education.

1. Give an account of the causes, effects and control measures of population explosion.
2. Write notes on any *two* of the following :
  - a) Natality
  - b) Age pyramid
  - c) Family welfare programme
  - d) Population growth.
3. Describe the different types of Air borne human diseases.
4. Write notes on any *two* of the following :
  - a) Biodiversity at National level
  - b) Cardio-vascular diseases
  - c) Endangered species
  - d) Balanced diet.

2016

Full Marks - 100

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you mean by depression in freezing point ? Derive a relationship between depression in freezing point and molecular mass of the solute dissolved in it. 2 + 7
  
- b) What is colligative property ? Prove that osmotic pressure is a colligative property. 2 + 2
  
- c) The vapour pressure of a solution is always lower than that of the pure solvent. Explain. 2

OR

- d) What do you mean by abnormal molecular mass ? What are the reasons for the abnormal molecular mass of a solute in the solution ? 2+3

[ 2 ]

- e) Derive an expression for the work done in reversible isothermal expansion of a gas. 6
- f) Calculate the amount of sucrose ( $C_{12}H_{22}O_{11}$ ) that must be added to 4Kg of water to yield a solution that will freeze at  $-3.72^{\circ}C$  (Molal depression constant for water is  $1.86 K. Kg. mol^{-1}$ ). 4
2. a) What is Joule-Thomson effect? Prove that the value of Joule-Thomson co-efficient for an ideal gas is zero. 1 + 4
- b) What is Carnot cycle? Derive an expression for the efficiency of heat engine working between two temperatures  $T_1$  and  $T_2$  (where  $T_2 > T_1$ ). 1 + 6
- c) Calculate the amount of heat supplied to Carnot cycle working between  $227^{\circ}C$  and  $127^{\circ}C$ , if the maximum work obtained is 960 joules. 3

OR

- d) Write notes on the following : 4 + 4
- i) Galvanic cell
- ii) Electro chemical series.

[ 3 ]

- e) Define pH. Calculate pH of 0.001M NaOH solution. 1 + 1
- f) Define specific conductance and equivalent conductance. Explain with graph how do they vary with dilution. 3 + 2
3. a) Write the IUPAC names of the following compounds 3
- i)  $K[Ag(CN)_2]$
- ii)  $[Cr(NH_3)_6]Cl_3$
- b) Discuss the geometrical isomerism in square planar and octahedral complexes. 4 + 4
- c) What are Chelates? Give examples. What are its applications? 1 + 1 + 2

OR

- d) Explain the following : 3 × 3
- i) Transition elements exhibit variable oxidation states.
- ii) Transition elements are usually coloured.

[ 4 ]

- iii) Transition elements and their ions are usually paramagnetic.
- e) Describe in detail ion exchange method of separation of lanthanides. 4
- f) Discuss the position of lanthanides in the periodic table. 2
4. a) Give an account of Lewis concept of acids and bases. 5
- b) Why zero group elements called as noble gases? Discuss their position in the periodic table. Explain the structure of  $\text{XeF}_6$  and  $\text{XeOF}_2$ . 2 + 2 + 6

OR

- c) How does diborane react with ammonia under various conditions of temperature and pressure. 4
- d) What is inorganic benzene? Explain its structure. 1+3
- e) Write two ores of nickel. How is nickel extracted from its chief ore? 1 + 6

[ 5 ]

5. a) Draw the conformations of cyclohexane and discuss about their stability. 7
- b) What are oximes? Give syn and anti notations for the oximes of acetaldehyde and acetophenone. 1 + 4
- c) What are the conditions necessary for geometrical isomerism? 2
- d) What is the cause of optical activity? Give the 'R' and 'S' notations of optical isomers of lactic acid and acetophenone. 2 + 4

OR

- e) What is racemic mixture? Explain chemical and biochemical methods of resolution of racemic mixture. 2 + 4
- f) Distinguish between enantiomers and diastereoisomers with examples. 4
- g) Write different conformations of ethane. Explain their stabilities. 2 + 4

[ 6 ]

- h) Compare the stabilities of chair and boat forms of cyclohexane. 4
6. a) How is methyl magnesium iodide prepared? Starting from it, how will you prepare 3+6
- i) ethyl alcohol
  - ii) acetaldehyde?
- b) What do you mean by ketonic hydrolysis of acetoacetic ester? Explain with an example. 5
- c) How will you carry out the following transformations———? 3 + 3
- i) Chloroacetic acid → Malonic ester
  - ii) Aceto-acetic ester → Ethyl methyl ketone.

OR

- d) How will you distinguish between primary, secondary and tertiary amines? 6
- e) How does ethylamine react with  $\text{CH}_3\text{COCl}$  and  $\text{CHCl}_3$  in presence of  $\text{KOH}$ . 2 + 2

[ 7 ]

- f) Write notes on the following :  $3\frac{1}{2} + 3\frac{1}{2}$
- i) Reimer-Tiemann reaction
  - ii) Fries rearrangement.
- g) How does phenol react with benzene diazonium chloride? 3

V-89-1.5





3. a) Explain the various procedures regarding the appointment of Company's Auditor. Discuss the civil liability of a Company's auditor. 10 + 10

OR

- b) What is an Auditor's Report ? Explain the kinds of Auditor's Report. Distinguish between Auditor's Report and Auditor's Certificate. 4 + 8 + 8

4. a) Discuss in detail the special features of a Bank Audit. 20

OR

- b) Describe the provisions of Insurance Act, 1938 which affect the audit of any Insurance Company. 20

5. a) What is Investigation ? Distinguish it clearly from auditing. Discuss the duties of an Investigator. 4 + 6 + 10

OR

- b) What do you mean by Cost Audit ? Explain the nature and significance of Cost Audit. 6 + 14

**2016**

Full Marks - 100

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is continuous audit ? To which organisation is it specially suitable ? Explain its advantages and limitations. 4 + 4 + 12

OR

- b) Distinguish between : 10 + 10  
 i) Internal audit and Statutory audit  
 ii) Interim audit and Final audit.

2. a) 'Vouching is an essence of auditing'. Explain this statement with suitable examples. 8 + 12

OR

- b) How would you verify the following assets 4×5  
 i) Patent  
 ii) Trademark  
 iii) Investment  
 iv) Land and Building.

[ 2 ]

3. a) Explain the various procedures regarding the appointment of Company's Auditor. Discuss the civil liability of a Company's auditor. 10 + 10

OR

- b) What is an Auditor's Report ? Explain the kinds of Auditor's Report. Distinguish between Auditor's Report and Auditor's Certificate. 4 + 8 + 8

4. a) Discuss in detail the special features of a Bank Audit. 20

OR

- b) Describe the provisions of Insurance Act, 1938 which affect the audit of any Insurance Company. 20

5. a) What is Investigation ? Distinguish it clearly from auditing. Discuss the duties of an Investigator. 4 + 6 + 10

OR

- b) What do you mean by Cost Audit ? Explain the nature and significance of Cost Audit. 6 + 14

V-93-4



**IV-UG-Com (EL)-IV (Audt)**

**2016**

Full Marks - 100

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What is continuous audit ? To which organisation is it specially suitable ? Explain its advantages and limitations. 4 + 4 + 12

OR

- b) Distinguish between : 10 + 10  
i) Internal audit and Statutory audit  
ii) Interim audit and Final audit.

2. a) 'Vouching is an essence of auditing'. Explain this statement with suitable examples. 8 + 12

OR

- b) How would you verify the following assets 4×5  
i) Patent  
ii) Trademark  
iii) Investment  
iv) Land and Building.

V-93

[Turn Over

3. a) Give an account of the waterborne and foodborne diseases.

OR

- b) Write notes on any *two* of the following :
- i) Family welfare programme
  - ii) Population explosion
  - iii) Vectorborne diseases.
4. a) Give an account of Bio-diversity at Global and National level.

OR

- b) Write notes on any *two* of the following :
- i) Water, a natural resource
  - ii) alternate energy resources
  - iii) Endangered species.
5. a) Give an account of Wild Life Protection Act and Environmental Protection Act.

OR

- b) Write notes on any *two* of the following :
- i) Water Act
  - ii) S.P.C.B (State Pollution Control Board)
  - iii) Air Act.

**2016**

Full Marks - 70

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. a) Give an account of the Forest and Grass land ecosystem

OR

- b) Write notes on any *two* of the following :
- i) Aquatic ecosystem
  - ii) Food chain
  - iii) Ecological Pyramids.

2. a) Describe the causes, effects and control measures of Air Pollution.

OR

- b) Write notes on any *two* of the following :
- i) Noise pollution
  - ii) Acid rain
  - iii) Earthquake.

[ 2 ]

**II-PG-Com-VI (MCOB)**

b) Write notes on the following : 6 + 7

i) Transactional analysis in communication.

ii) Improvement techniques in communication.

**2016**

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Define the term "Group" and describe the various types of groups that are formed in an organisation. 2+12

OR

- b) Discuss the "Behaviourial" theory of leadership. 14

2. a) Discuss the modern approaches to Organisational Conflicts. 13

OR

- b) Discuss about dysfunctional organisational conflicts. 13

3. a) Discuss the barriers to effective communication. 13

OR

V-110-1



V-110

[Turn Over

- c) Role of Parliamentary Committees in policy making.
- d) Techniques of identifying policy proposals by the Executive.

**2016**

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Define Political Elites. Discuss Robert Michael's theory of Political Elites. 12

OR

- b) Examine the relation of the power of the Elite and the masses in democratic societies.

2. a) Discuss the meaning and significance of Public Policy Making. 12

OR

- b) Explain the impact of Judiciary in Public Policy Making.

3. Write notes on any *two* of the following : 8 × 2

- a) Emergence of new elites in the power structure
- b) Elites and social stratification

V-107-0.5



- b) Write notes on:  $2 \times 6$
- i) Population inversion
  - ii) Maser
3. a) Discuss scattering amplitude and scattering cross section. Obtain the wave function for a scattered wave using first order Born approximation. Hence obtain the scattering cross section for a Coulomb potential. 12
- OR
- b) Using partial wave analysis method obtain expressions for scattering amplitude and total scattering cross section. 12

V-107-0.3

**2016**

Full Marks - 40

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Give the theory of time independent perturbation for non-degenerate case. 8
  - b) Using WKB approximation derive Bohr-Sommerfeld quantization rule. 8
- OR
- c) Outline the theory of variational method. 4
  - d) Obtain the ground state energy of He atom using variation method. 12
2. a) Apply the time dependent perturbation theory to obtain Fermi's golden rule for a harmonic perturbation and obtain the selection rule for electric dipole transition. 8 + 4

OR

V-108

[Turn Over

4. a) As a Secretary of a youth club, draft a report on the functioning of a blood donation camp in your area. 15

OR

- b) There is an accident in your area of which you are an eye-witness. Write a report to be published in the local newspaper.
5. a) The "Old man and the Sea" as a small epic in prose. Elucidate. 20

OR

- b) Santiago is any adventurous Christian who loves to dabble in the sea. Explain.
6. a) Discuss Miller's "All my Sons", as a tragedy. 20

OR

- b) Draw a character sketch of Joe Keller.

**2016**

Full Marks - 100

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Fill in the blanks by choosing appropriate words from the brackets : 4
- i) One of the girls \_\_\_\_\_ (was/were) able to answer the question correctly.
- ii) The teacher with all his students \_\_\_\_\_ (have/has) come.
- iii) Neither the doctor nor the nurses \_\_\_\_\_ (is/ are) to blame.
- iv) The ring is made \_\_\_\_\_ (of/from) gold.
- b) Change the voice of the following sentences : 4
- i) Do all the good things in life.
- ii) He showed me some silk goods.
- iii) Does his father take him on Sundays ?
- iv) Be prepared for the worst.

[ 2 ]

- c) Change the following sentences into indirect speech: 4
- My brother said, "Kakatpur is famous for Mangala Temple".
  - Piyush said to me, "Did you to the library yesterday" ?
  - The blind boy said, "Have pity on me".
  - The people said, "Long live the Prime Minister".
- d) Replace the underlined portions by suitable phrasal verbs : 4
- The enemy surrendered.
  - I have already stopped smoking.
  - Will you please investigate the matter yourself?
  - The thief escaped with all valuables.
- e) Punctuate the following sentences : 4
- Mothersaid why don'tyou select English as your honours subject I replied that English is a foreign language which is very difficult to digest. What is your opinion of it.

[ 3 ]

2. a) Write an application to the HR Manager of a company in response to an advertisement in the Times of India, to appoint you as a Computer Operator. 10

OR

- b) Define the word "resume". Write the format of a resume.

3. Edit the following passage : 15

Both Young people And old people of odisha have A preference fore meat and Fish but young peoples have a Greater desire for Non-vegeterian food sowfar as fruit and vegetables are concerned Old people Have a Greater preference for them Both old and Young peoples prefer Too eat cereals and pulses but Old people like such foods a little more. As two Milk and milk products, both the younge and the Olde like them but the young like it more then the Old. Thus their isn't much differance in the Preferance From food by Young and Old people of Odisha.



2016

Full Marks - 75

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Outline Bohr's theory of hydrogen atom taking into account the finite mass of the nucleus. Explain the effect of nuclear mass on the Rydberg constant and how it led to the discovery of heavy hydrogen. 8 + 3 + 4

OR

- b) What are X-rays? Describe with neat diagram an experimental outfit for producing them. Mention some of their uses. 3 + 9 + 3

2. a) Describe, with neat diagram, Davisson-Germer experiment on the diffraction of electron. How does this experiment establish the wave nature of matter? 3 + 8 + 4

OR

[ 2 ]

- b) Derive time dependent Schrodinger equation in three dimension for a particle in a conservative force field, and give a comment on this equation. 12+3
3. a) Setup the Schrodinger equation for a particle in one dimensional infinite deep potential well. Solve it to obtain the energy eigenvalues and eigenfunctions. 3 + 12

OR

- b) Obtain the time independent Schrodinger equation in one dimension starting from the corresponding time dependent equation. Under which condition can this be achieved? 10+5
4. a) Describe the construction and working of a linear accelerator. What are its advantages over Cyclotron? 12 + 3

OR

- b) Write brief notes on the following : 5 × 3
- i) Stability of nucleus
  - ii) Liquid drop Model
  - iii) GM Counter.

[ 3 ]

5. a) Describe the Michelson-Morely experiment and give the theoretical basis of this experiment. Discuss the various interpretations on its null result. 12 + 3

OR

- b) Derive the Einstein's mass energy relation. 7½
- c) Prove that  $E^2 = p^2c^2 + m_0^2 c^4$  where the symbols carry their usual meanings. 7½

V-99-1.5



[ 4 ]

- 5 a) How succinic acid and crotonic acid can be synthesized from acetoacetic ester?  $6\frac{1}{2}$   
b) How ethane, ethyl alcohol and acetic acid can be synthesized from Grignard's reagent? 6

OR

- c) How glycine and alanine can be prepared by Strecker's synthesis method? 4  
d) What is peptide linkage?  $2\frac{1}{2}$   
e) What is Zwitter ion? Explain. 2  
f) Write the mechanism of preparation of ethyl acetoacetate by Claisen condensation. 4
- 6 a) Explain why pyrrole undergoes electrophilic substitution at 2-position? 4  
b) How furan can be prepared from mucic acid? 2  
c) Write the mechanism of nitration of Thiophene.  $4\frac{1}{2}$   
d) How will you synthesize 2-phenylazopyrrole from pyrrole? 2

OR

- e) Write any two methods of preparation of organo sulphur compounds and give two uses of it.  $6\frac{1}{2}$   
f) Write notes on antibiotic and analgesics. 3 + 3

IV-UG-Chem(P/EL)-VII

2016

Full Marks - 75

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you mean by 'Transport Number'? Briefly describe Hittorf's method for the determination of transport number of  $\text{Ag}^+$  and  $\text{NO}_3^-$  in  $\text{AgNO}_3$  solution when (i) electrode of platinum are used (ii) electrode of silver are used. 2 + 3 + 3  
b) A solution containing 10.09g of  $\text{CuSO}_4$  in 189.9g of water was electrolysed. After electrolysis 275.4gm of the solution around the anode was found to contain 15.4g of  $\text{CuSO}_4$ , 3.096 of silver was deposited in a coulometer placed in series. Calculate the Hittorf's numbers of  $\text{Cu}^{2+}$  and  $\text{SO}_4^{2-}$  ions.  $4\frac{1}{2}$

OR

- c) What is meant by salt hydrolysis, hydrolysis constant and degree of hydrolysis? Derive expression for hydrolysis constant, degree of hydrolysis and pH of the solution for salt of weak acid and strong base. 8

[ 2 ]

- d) Determine the pH of a solution obtained by mixing equal volume of 0.01 N ammonium nitrate and 0.02 N ammonium hydroxide solutions. ( $K_b$  for  $\text{NH}_4\text{OH}$  being  $1.8 \times 10^{-5}$ ). 2
- e) What is ionic product of water?  $2\frac{1}{2}$
2. a) How is the standard electrode potential of an electrode measured using
- using standard hydrogen electrode
  - calomel electrode, as reference electrode? Explain with suitable examples 6
- b) Devise an electrochemical cell in which the net reaction is 4
- $$\text{H}_{2(g)} + 2\text{Ag}_{(s)} \rightleftharpoons \text{Ag}_{(s)} + 2\text{H}^+ + 2\text{I}^-$$
- c) Why KCl is not used in the salt bridge in case of Cu - Ag cell  $2\frac{1}{2}$
- OR
- d) What is corrosion? Give theory of rusting of iron. Briefly explain different methods of preventing corrosion. 7
- e) Explain the term "degrees of freedom" with suitable examples as used in phase rule.  $3\frac{1}{2}$
- f) What will be the number of degrees of freedom for a system consisting of a saturated aqueous solution of NaCl in contact with solid salt and vapour? 2

[ 3 ]

3. a) How borazine can be prepared from lithium borohydride? Discuss the structure of borazine. What happens when borazine is hydrolysed. Explain why borazine is called inorganic benzene.  $2 + 4 + 2 + 2$
- b) Discuss the structure of  $\text{ICl}$ .  $2\frac{1}{2}$
- OR
- c) Write a note on preparation, properties, structure and uses of fullerene.  $8\frac{1}{2}$
- d) Write names of all oxides of nitrogen and mention the oxidation state of nitrogen in those oxides. 4
4. a) Describe the extraction of Chromium from one of its important Ore. Describe its properties and uses.  $10\frac{1}{2}$
- b) Write name of one Ore each of Cobalt and Manganese. 2
- OR
- c) Discuss any two methods of preparation and two chemical properties of Potassium dichromate. 8
- d) Describe the function of haemoglobin in biological processes.  $4\frac{1}{2}$

9. a) Use duality to solve the LPP

$$\text{Max } z = 4x_1 + 2x_2$$

$$\text{s.t. } x_1 + x_2 \geq 3, \quad x_1 - x_2 \geq 2, \quad x_1, x_2 \geq 0.$$

OR

b) Obtain the dual of the LPP

$$\text{Max } z = x_1 + x_2 + x_3$$

$$\text{s.t. } x_1 - 3x_2 + 4x_3 = 5, \quad x_1 - 2x_2 \leq 3, \quad 2x_2 - x_3 \geq 4$$

$$x_1 \geq 0, \quad x_2 \geq 0, \quad x_3 \text{ unrestricted.}$$

10. a) Obtain initial BFS to the transportation problem by Vogel's method

	1	2	3	4	Availability
1	20	22	17	4	120
2	24	37	9	7	70
3	32	37	20	15	50
Requirement	60	40	30	110	240

OR

b) Solve the assignment problem

	1	2	3	4
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

2016

Full Marks - 100

Time - 3 Hours

The questions are of equal value

Answer *all* questions

*Symbols used have their usual meaning*

1. a) Obtain an approximation to a root of the equation  $x^3 - x - 1 = 0$  correct to 2 decimal places using Secant method.

OR

b) Find the value  $\sqrt{3}$  of to 2 significant figures using Bisection method.

2. a) Derive Newton's Divided difference interpolation formula for  $(n + 1)$  nodes.

OR

b) Find the quadratic Lagrange's interpolating polynomial which passes through the points  $(-1, 0), (0, 1), (1, 0)$ .

3. a) Derive Trapezoidal Rule and find the error.

OR

b) Evaluate  $\int_0^1 x e^{-x} dx$  by 2-point and 3-point Gauss Legendre Rule.

[ 2 ]

4. a) Solve  $\frac{dy}{dx} = 2 + \sqrt{xy}$ ,  $y(1) = 1$  by Euler's method choosing  $h = 0.1$  and find  $y(1.3)$

OR

- b) Using Picard's method find 5th approximation of the equation

$$\frac{dy}{dx} = x + y, \quad y(0) = 0$$

5. a) Solve the system of equations by Gauss Seidel method

$$2x_1 - x_2 = 7$$

$$-x_1 + 2x_2 - x_3 = 1$$

$$-x_2 + 2x_3 = 1$$

OR

- b) Find the approximations to  $\frac{d\sqrt{x}}{dx}$  at  $x=1$  by using central difference formula of order  $O(h^2)$  with  $h = 0.1, 0.01, 0.001$ .

6. a) A firm manufactures headache pills in two sizes A and B. Size A contains 2 grains of aspirin, 5 grains of bicarbonate and 1 grain of codeine. Size B contains 2 grains of aspirin, 4 grains of bicarbonate and 6 grain of codeine. It is found by user that it requires at least 12 grains of aspirin, 74 grains of bicarbonate and 24 grain of codeine for providing immediate effect. It is required to

[ 3 ]

determine the least number of pills a patient should take to get immediate relief. Formulate this as LPP.

OR

- b) Solve graphically

$$\text{Max } z = 50x_1 + 60x_2$$

$$\text{s. t } 2x_1 + 3x_2 \leq 1500, \quad 3x_1 + 2x_2 \leq 1500$$

$$0 \leq x_1 \leq 400, \quad 0 \leq x_2 \leq 400$$

7. a) Define convex set. Prove that the set of all convex combinations of finite number of points of  $S \subset E^n$  is a convex set.

OR

- b) Let  $A$  is any finite subset of vectors in  $R^n$ . Prove that the convex hull of  $A$  is the set of all convex combinations of vectors of  $A$ .

8. a) Use two phase simplex method to solve

$$\text{Min } z = x_1 + x_2$$

$$\text{s. t } 2x_1 + x_2 \geq 4, \quad x_1 + 7x_2 \geq 7, \quad x_1, x_2 \geq 0,$$

OR

- b) Let  $x_1 = 1, x_2 = 1, x_3 = 1$  is a feasible solution to the system of equations

$$x_1 + x_2 + 2x_3 = 4, \quad 2x_1 - x_2 + x_3 = 2$$

Reduce the given feasible solution to a BFS

3. a) Give a brief account of the different plant growth regulations.

OR

- b) Write notes on the following :
- Phases of growth
  - Growth inhibitor.

4. a) Discuss the causes, effects and control measures of Water Pollution.

OR

- b) Write notes on the following :
- Stem anatomy of Hydrophytes
  - Food chain.

5. a) Give an account of Microsporogenesis in Angiosperms.

OR

- b) Write notes on the following :
- Bisporic Embryosac
  - Anatropous ovule.

**2016**

Full Marks - 75

Time - 3 Hours

The questions are of equal value

Answer *all* questions

*Give labelled diagram wherever necessary*

1. a) Give an account of the mechanism of Stomatal opening and closing during transpiration.

OR

- b) Write notes on the following :
- Osmosis
  - Passive absorption.

2. a) Describe briefly the mechanism of light reaction in Photosynthesis.

OR

- b) Write notes on the following :
- Biological Nitrogen fixation
  - C<sub>4</sub> plants.

[ 2 ]

3. a) Describe the structure and function of an ecosystem

OR

- b) Write notes on any *two* of the following :
- i) Biosphere
  - ii) Energy flow
  - iii) Concept of population.

4. a) Give an account of humoral and cell mediated immunity.

OR

- b) Write notes on any *two* of the following :
- i) Non-renewable resources
  - ii) Alternative sources of energy
  - iii) Antigen.

5. a) Write an essay on Sericulture and add a note on its significance.

OR

- b) Write notes on any *two* of the following :
- i) Standard deviation
  - ii) Frequency distribution
  - iii) Induced breeding.

IV-UG-Zool(P/EL)-VII

2016

Full Marks - 75

Time - 3 Hours

The questions are of equal value

Answer *all* questions

*Give labelled diagram wherever necessary*

1. a) Describe the structure and function of adrenal gland.

OR

- b) Write notes on any *two* of the following :
- i) Pancreatic islets
  - ii) Classification of hormones
  - iii) Adenohypophysis.

2. a) Give an account of placentation in Mammals.

OR

- b) Write notes on any *two* of the following :
- i) Gastrulation of frog
  - ii) Embryo transfer technology
  - iii) Spermatogenesis.



2016

Full Marks - 80

Time - 3 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions*Fixed overheads:*

Depriciation	11,000	
Insurance	3,000	
Salaries	10,000	
	<u>62,000</u>	
Estimated direct labour hours	124,000 hours.	16

5. a) Discuss the advantages and limitations of Standard Costing. 3 + 8

OR

- b) The standard mix to produce one unit of product is as follows. 16

Material A 60units @ ₹15 per unit = ₹900

Material B 80units @ ₹20 per unit = ₹1600

Material C 100unit @ ₹25 per unit = ₹2500

During the month of July, 10 units were actually produced and consumption was as follows :

Material A 640units @ ₹17.50 per unit = ₹11, 200

Material B 950units @ ₹18.00 per unit = ₹17,100

Material C 870units @ ₹27.50 per unit = ₹23, 925

<u>2460 units</u>	<u>₹ 52, 225</u>
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Calculate the material variances.

1. a) Discuss in detail the nature and the functions of Management Accounting. 8 + 8

OR

- b) From the information given below, you are required to prepare to Balance Sheet of X. Ltd. Company as on 30.6.2015. 16

Net working capital as on 30.6.2015 = ₹2.8 lakhs.

Fixed Assets Turnover Ratio = 2 times

Current ratio = 2.4

Liquidity ratio = 1.6

Inventory turnover (on cost of sales) = 8

Gross profit on sales = 20%

Credit allowed (months) = 1.5

Fixed assets are equivalent to 80% of its networth (Share capital + reserves)

Reserves represent 40% of share capital.

2. a) Distinguish between Funds Flow Statement and Cash Flow Statement. 8

- b) Give the lists of Operating, Investing and Financing activites. 8

OR

[ 2 ]

- c) From the following Balance Sheet and additional information of A. Ltd. for the years 2014 and 2015, prepare Funds Flow Statement and Statement of Changes in Working Capital.

Balance Sheet

Liabilities	2014 (₹)	2015 (₹)	Assets	2014 (₹)	2015 (₹)
Share capital	2,00,000	2,50,000	Goodwill	7,500	5,000
General reserve	10,000	25,000	Land & Buildings	1,42,500	1,57,500
Profit and Loss A/c	15,000	50,000	Plant & machinery	93,000	75,000
12% Debenture	2,00,000	2,35,000	Investment (Long term)	75,000	75,000
Sundry Creditors	1,25,000	60,000	Stock	2,00,000	1,80,000
Bills Payable	75,000	40,000	Sundry Debtors	1,50,000	1,65,000
Proposed dividends	40,000	40,000	Cash in hand	6,250	12,500
Provision for tax	60,000	50,000	Cash at Bank	50,750	80,000
	7,25,000	7,50,000		7,25,000	7,50,000

Additional Information :

- i) An interim dividend of ₹25,000 was paid during the year
  - ii) Investments Costing ₹20,000 were sold at a profit of ₹10,000 during the year.
  - iii) Taxes paid during the year was ₹60,000
  - iv) Depreciation charged in land and building was ₹15,000 and on plant and machinery was ₹9,300. 16
3. a) Explain the following: 5 + 6 + 5
- i) Essential features of differential costing.
  - ii) Similarities and dissimilarities between Differential Costing and Marginal Costing.
  - iii) Managerial applications of differential costing.

OR

[ 3 ]

- b) The following information are available from the records of a company for the years 2014 and 2015.

	2014 ₹	2015 ₹
Sales	1,20,000	1,40,000
Profit	8,000	13,000

Find out :

- i) P/V ratio
  - ii) Break even point
  - iii) Profit when sales are ₹1,80,000
  - iv) Sales required to earn a profit of ₹12,000
  - v) Margin of safety in 2015. 16
4. a) Write notes on the following: 8 + 8
- i) Zero base budgeting
  - ii) Performance budgeting.

OR

- b) Prepare a flexible budget for overhead expenses on the basis of the following data and also determine the overhead rates of 70%, 80% and 90% plant capacity

At 80% capacity (₹)

Variable overheads :

Indirect labour 12,000

Stores including spares 4,000

Semi-variable overheads :

Power (30% Fixed and 70% Variable) 20,000

Repairs (60% Fixed and 40% Variable) 2,000

V-104

[ Turn Over

[ 2 ]

4. a) Discuss the features of a good Compensation plan.

OR

b) Describe the benefits and limitations of time rate and piece-rate system of paying compensation?

5. a) What do you mean by Industrial Democracy ?  
What are its benefits.

OR

b) Write notes on the following :

i) Grievance procedure

ii) Trade Union Movement in India.

V-105-1



**IV-UG-BBA(EL)-IV (HRM)**

**2016**

Full Marks - 100

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. a) Explain the functions performed by Personnel department

OR

b) Discuss the scope of HRD system.

2. a) Differentiate between recruitment and selection.  
Explain the process of selection.

OR

b) Discuss the various methods of training..

3. a) Define motivation. What are the benefits of motivation

OR

b) What do you mean by Job Design ? What are the different approaches to job design ?

V-105

Turn Over

[ 2 ]

4. a) Discuss the features of a good Compensation plan.

OR

b) Describe the benefits and limitations of time rate and piece-rate system of paying compensation?

5. a) What do you mean by Industrial Democracy? What are its benefits.

OR

b) Write notes on the following :

i) Grievance procedure

ii) Trade Union Movement in India.

V-105-1



**IV-UG-BBA(EL)-IV (HRM)**

**2016**

Full Marks - 100

Time - 3 Hours

The questions are of equal value

Answer *all* questions

1. a) Explain the functions performed by Personnel department

OR

b) Discuss the scope of HRD system.

2. a) Differentiate between recruitment and selection. Explain the process of selection.

OR

b) Discuss the various methods of training..

3. a) Define motivation. What are the benefits of motivation

OR

b) What do you mean by Job Design? What are the different approaches to job design?

V-105

Turn Over