

II-UG-Chem(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Recrystallise supplied organic compound _____ using the solvent _____. Determine its melting point and yield. 15
2. Viva-Voce. 6
3. Record. 4

V-329-0.6



II-UG-Chem(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Determine the heat capacity of the calorimeter. Using the result determine the enthalpy of neutralisation of _____ M HCl and _____ M NaOH. 5+10

OR

- b) Determine the enthalpy of ionisation of acetic acid of _____ M after determining the enthalpy of neutralisation of _____ M HCl and _____ M NaOH and of acetic acid and NaOH of the above concentration. 15

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

V-340-0.6



II-UG-Chem(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare 2, 4-dinitrophenyl hydrazine of aldehyde or ketone. Determine its melting point and yield. 15

OR

Prepare benzoyl derivative of amine or phenol.
Determine its melting point and yield.

OR

Recrystallise supplied benzoic acid from water.
Determine its melting point and yield.

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

IV-UG-Chem(CC)-VIII (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 Ni(II) using dimethyl glyoxime (DMG). 15

OR

Prepare tetrammine copper (II) sulphate. Determine its M.P. and yield.

OR

Prepare potassium tris (oxalate) ferrate (III).
Determine its m.p. and yield.

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

IV-UG-Chem(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the supplied unknown organic compound
No. _____ 15
2. Viva-Voce. 6
3. Record. 4

V-371-0.6



IV-UG-Chem(CC)-X (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the strength of the supplied acid/base by
conductometric titration. 15

OR

Determine the strength of the supplied acid/base by
potentiometric titration.

OR

Determine the strength of Mohr's salt using potassium
dichromate solution by potentiometric titration.
2. Viva-Voce. 6
3. Record 4

V-382-0.6



II-UG-Bot(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Make temporary preparation of the supplied specimen 'A'. Draw labelled diagram. Comment and identify with reasons. 5
2. Make temporary preparation of the supplied specimen 'B'. Draw labelled diagram. Comment on the pathological characters of the specimen and identify with reasons. 5
3. Draw and identify the microslides/materials on spot 'C', 'D' and 'E'. 2 × 3
4. Submit herbarium specimens infected with diseases. 2
5. Viva-Voce. 5
6. Record. 2



II-UG-Zool(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Study of life cycle of any *one* of the following : 9
 - a) Termite
 - b) Honey bee
 - c) Silk moth.
2. Identify and comment on the spots I to VI. 1½ × 6
(2 histological slides and 4 museum specimens from different phylum)
3. Practical Record. 3
4. Viva-Voce. 4



II-UG-Bot(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Make a temporary preparation of the supplied Specimen 'A'. Draw labelled diagrams. Comment and identify with reasons. 6
2. Make a temporary preparation of the supplied specimen 'B'. Draw labelled diagrams. Comment and identify with reasons. 6
3. Identify on spot C, D, E with labelled diagrams and reasons. 6
4. Viva-Voce. 5
5. Class Record. 2

II-UG-Edn(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is a blue print ? Prepare a blue print of your method subject. 15

OR

Construct an Achievement Test with 15 objective based objective type test items.

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

II-UG-Zool(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Conduct any *one* of the following physiological experiments as per the instruction given by the examiner : 8
 - a) Enumeration of Red Blood Cells using haemocytometer.
 - b) Estimation of Haemoglobin using Sahli's haemoglobinometer.
2. Prepare haemin crystals of mammalian blood. 4
3. Identify and comment on the Spot I to IV. $1\frac{1}{2} \times 4$
(Mammalian histological slides shall be given).
4. Practical Record. 3
5. Viva-Voce. 4



II-UG-Bot(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Make a temporary preparation of the Supplied Specimen 'A'. Draw labelled diagrams and identify with reasons. 6
2. Make a temporary preparation of the supplied Specimen 'B'. Study the anatomy and comment on the adaptive features. Give labelled diagrams. 6
3. Draw and identify the materials / micro slides / photographs on spot C, D, E. 6
4. Viva-Voce. 5
5. Class Record. 2



II-UG-Zool(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. To prepare Haemin crystals of your own blood. 6
2. To estimate Haemoglobin (using Sahli's haemoglobinometer) of your own blood. 6
3. Identify with labelled diagram and comment on the histological slides given as spots I to IV. 6
4. Practical Record. 3
5. Viva-Voce. 4

V-352-0.5



IV-UG-Zool(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Determine the Absorbance maxima of the supplied sample solution by colorimeter. 9

OR

Determine the Beer-Lambert's law by using colorimeter.

2. Identify the presence of Carbohydrate in the given solution. 8
3. Practical Record. 4
4. Viva-Voce. 4

V-361-0.5



IV-UG-Bot(CC)-VIII(Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare the LB medium. 9
2. Identify and explain the supplied photograph of:
DNA replication mechanism / Nucleic acid and
genetic material / RNA Polymerase / Spliceosome
machinery. 6
3. Draw and comment on the supplied photographs /
models 'A' and 'B'. 2×2
4. Viva-Voce. 4
5. Record. 2

IV-UG-Phy(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *one* of the following: 15
 - a) Determine Planck's constant using photodetector.
 - b) Draw a graph between photoelectric current in intensity of light source and also determine the work function ' ϕ ' of the material used.
 - c) Determine value of e/m by (i) magnetic focusing or (ii) using a bar magnet.
 - d) Determine the wavelength ' χ ' of a supplied laser source using diffraction through single slit.
 - e) Determine the wavelength ' λ ' of a given laser source using diffraction of double slits.
 - f) Determine the wavelength ' λ ' of a supplied laser source using plane diffraction grating.
2. Viva-Voce. 6
3. Record. 4

IV-UG-Zool(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. To study the presence of Barr body in human female blood cells / cheek cells. 9
2. To identify the stages of cell division with labelled diagrams and comments given as spots I to VI. 9
3. Practical Record. 3
4. Viva-Voce. 4

V-373-0.5



IV-UG-Bot(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Analyse quantitatively the herbaceous vegetation for density and abundance in the college campus. 8
2. Determine the pH of supplied sample. 4
3. Draw and comment on the supplied specimens / instruments. 2 × 3
4. Viva-Voce. 5
5. Class Record. 2

V-372-0.5



IV-UG-Bot(CC)-X (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Dessect, draw and describe in technical terms of the Specimen 'A'. Underline the dignostic characters. Write floral formula, draw floral diagram. Identify the genus and species and the family to which it belongs. 7
2. Identify on the spot : 2×3
Write the Botanical name and family name of the supplied specimen B, C and D.
3. a) Submission of field study note. 2
b) Herbarium collection of wild plants. 3
(15 minimum)
4. Viva-Voce. 5
5. Class Record. 2



IV-UG-Zool(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Estimate the percentage of Haemoglobin in your own blood by using Sahle's haemoglobinometer. 8
 2. Prepare a temporary mount of mammalian blood film. 4
- OR
- Prepare haemin crystals of mammalian blood.
3. Identify and comment on the spots I to IV. $1\frac{1}{2} \times 4$
(Histological slides of mammal shall be given)
 4. Practical Record. 3
 5. Viva-Voce. 4



II-UG-Psy(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the personality type of an undergraduate college student using Glazer's test of personality type/ any other appropriate personality-type scale. 12

OR

Test the nonverbal intelligence of a college student/ self by administering 'Raven's Standard Progressive Matrices' (RPM).

2. Record. 5
3. Viva-Voce. 8



II-UG-C.Sc(CC)-IV (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 : $7\frac{1}{2} \times 2$
 - a) Write a program in C to perform PUSH, POP operations on Stack (Using Array).
 - b) Write a program in C to evaluate any postfix expression.
 - c) Write a program in C to create a linked list and reverse it.
 - d) Write a program in C to perform insert and delete operation in a circular queue.

2. Record and Attendance. 4

3. Viva-Voce. 6



II-UG-Psy(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Demonstrate experimentally the learning curve as a function of learning trials using Nonsense Syllables. 12

OR

Find out experimentally the "Serial Position Effect" on memory in learning a list of nonsense syllables.

2. Record. 5
3. Viva-Voce. 8

V-348-04



IV-UG-Edn(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write a review report on the text book relating to your method subject for class VI. 10

OR

Give an outline of Curriculum for your method subject of class 6th.

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

V-356-04



IV-UG-Edn(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Construct Ten (10) objective based multiple choice questions on any topic of your method subject from the primary school syllabus. 10

OR

What is blue print. Prepare a blue print (3 dimensional) on your method subject.

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

V-368-0.4



IV-UG-C.Sc(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write any *one* client/server socket programs in C from the following : 15

a) Program for TCP connections to send and receive messages from both the sides.

b) Program for TCP connections to send and/or receive files to/from both the sides.

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

V-374-0.4



IV-UG-Edn(CC)-X(Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is Project Proposal ? Give a project proposal for conducting action research on any problem in the class room. 10

OR

Give a synopsis on a project of your choice for conducting research.

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

V-379-04



IV-UG-C.Sc(CC)-X(Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Write a C program to draw a circle. 7½
- b) Write a C program to clip a polygon. 7½

OR

- c) Write a C program to clip a line using Cohen and Sutherland line clipping algorithm. 7½
- d) Write a C program to draw a line. 7½

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

V-385-04



II-UG-Psy(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Demonstrate experimentally the learning curve as a function of learning trials using Nonsense Syllables. 12

OR

Find out experimentally the 'Serial Position Effect' on memory in learning a list of Nonsense Syllables

2. Record. 5
3. Viva-Voce. 8

II-UG-Edn(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Describe the Ravens Progressive Matrices Test and its use. 10

OR

Differentiate between Individual Intelligence Test Group Intelligence Test with examples.

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

II-UG-Edn(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Write a lesson plan of any topic of your method in 5E model. 10

OR

Write a lesson plan of any topic of your method in Icon design model.

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

V-337-0.3



IV-UG-Geog(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Construct a diagram showing age-sex structure of India from the supplied data. 6
2. Draw a map representing population distribution of India. 6
3. Draw a cricle diagram from the supplied data. 8
4. Practical Record. 2
5. Viva-Voce. 3

V-354-0.3



IV-UG-Psy(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the anxiety level of the subject by administering Hamilton Anxiety Rating Scale (HARS) 12

OR

Assess the depression level of an adult female by administering Beck's Depression Inventory (BDI).

2. Record. 5
3. Viva-Voce. 8

V-357-0.3



IV-UG-Geol(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a suitable geological section along the given line on the map. Interpret the structure and describe the geology of the area (map to be supplied at the time of exam). 6
2. Complete the out crop (map to be given). 4
3. Solve the numerical problem related to dip and strike. (To be given at the time of exam). 4
4. Solve the 3-point problem. (To be given) 4
5. Lab Record. 3
6. Viva-Voce. 4

V-363-0.3



IV-UG-Geog(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Find out the average value of a distribution from the supplied datasheet. 6
2. Draw regression line from the supplied datasheet. 6
3. Draw a diagram representing Cumulative frequency distribution. (Data to be supplied) 8
4. Practical Record. 2
5. Viva-Voce. 3

V-366-0.3



IV-UG-Psy(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the academic attitude and behaviour of the college students by using SIA's academic behaviour scale. 12

OR

Assess academic stress of +2 students by administering Rao's academic stress scale.

2. Record. 5
3. Viva-Voce. 8

V-369-0.3



IV-UG-Geol(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the given fossils mentioning their important morphological characters. ($f_1 - f_5$) 10
2. Draw and label the given fossils ($f_6 - f_7$). 6
3. Arrange the given fossil in chronological order. 2
4. Lab. Record. 3
5. Viva-Voce. 4

V-375-0.3



IV-UG-Geog(CC)-X (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 major tribes of India. 6
2. Prepare a chart showing different races of mankind. 6
3. Construct a map showing distribution of scheduled castes in India. (Data to be supplied) 8
4. Practical Record. 2
5. Viva-Voce. 3

V-377-0.3



IV-UG-Psy(CC)-X (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Assess the empathy behaviour of four college students using Spring's empathy questionnaire. 12

OR

Assess the sense of humour of four college students by administering Mc Ghee's Scale of Sense of Humours (MSSH) or any other appropriate scale of sense of humour.

2. Record. 5
3. Viva-Voce. 8

V-380-0.3



IV-UG-Geol(CC)-X (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw the following stratigraphic units in the outline map of India. 6
 - a) Cuddapah super group
 - b) Vindhyan super group
 - c) Gondwana super group.
2. Draw the following stratigraphic units on the outline map of Odisha. 4
 - a) Baripada beds
 - b) Easternghat group.
3. Identify the given specimens and arrange them chronologically. 2
4. Draw the tectonic division of India map. 6
5. Lab. Record. 3
6. Viva-Voce. 4

V-386-0.3



IV-UG-Geog(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare a map showing rice cultivation regions of India. 6
2. Prepare a map highlighting different Himalayan regions of India. 6
3. Prepare a map showing drainage systems of Odisha. 8
4. Practical Record. 2
5. Viva-Voce. 3



II-PG-Phy-X (Pr)

2018

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Perform any *one* of the following experiments

1. Study the given power supply. 30
2. Calibrate the given CRO. 30
3. Verify the truth tables for different GATE circuits. 30
4. Solve the following simultaneous equations writing the appropriate programme. 30
$$3x + 2y = 7$$
$$x - 2y = 5$$
5. Generate and print the first 100 prime numbers. 30
6. Find out the sum of an AP/GP. 30
7. Solve $x^2 - 5x + 6 = 0$ after writing a suitable programme. 30

Experiment 30

Viva-voce 12

Record 08



II-PG-Phy-IX (Pr)

2018

Full Marks - 50

Time - 6 Hours

The figures in the right-hand margin indicate marks

Perform any **one** of the following experiments

1. Draw the Triode characteristics graphs. 30
(Both Static and Dynamic)
2. Draw the Transistor Characteristic graph (Either PNP or NPN) in CE and CB mode. 30
3. Study the working of Transistor as Amplifier. Find out the voltage gain. 30
4. Study the application of transistor as Hartley Oscillator. Find out the frequency of Oscillation. 30
5. Determine the band gap of the junction diode. 30
6. Draw the characteristics of the Zener Diode. 30

Experiment	30
Viva-voce	12
Record	08



II-UG-Geog(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. Interpret the supplied weather map on the following heads : 6
 - i) Sky condition
 - ii) Wind
 - iii) Pressure Condition.
2. Prepare a wind rose diagram from the supplied data. 6
3. Prepare a weather map with comfort scale. 8
(Data to be supplied)
4. Practical Record. 2
5. Viva-Voce. 3



II-UG-Geol(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the given crystal models (C_1 to C_4). 8
2. Draw the stereographic projection of the given crystal model (C_5). 3
3. Identify the given rock-forming minerals megascopically (M_1 to M_7). 7
4. Lab Record. 3
5. Viva-Voce. 4

II-UG-Geog(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare a hypsometric curve. 6
(Data to be supplied)
2. Draw a T-S Diagram. 6
3. Draw the ocean currents of Atlantic Ocean. 8
4. Practical Record. 2
5. Viva-Voce. 3

II-UG-Geog(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Prepare a map showing cotton cultivation regions in India. 6
2. Show different physical divisions of India. 6
3. Prepare a map showing population distribution of India by chroplith mapping technique. 8
(Data to be supplied)
4. Practical Record. 2
5. Viva-Voce. 3

II-UG-Geol(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Identify the given rock-forming minerals microscopically . (M_1 to M_4). 12
2. Measure the extinction angle of the given mineral under microscope. (M_5). 3
3. Find out the order of interference colour of the given mineral (M_6). 3
4. Lab. Record. 3
5. Viva-Voce. 4

IV-UG-Anth(CC)-VIII (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is hypothesis ? Mention various types of hypothesis. 10
2. Distinguish between hypothesis and exploratory research. 5
3. Record. 5
4. Viva-Voce. 5

V-353-02



IV-UG-Anth(CC)-IX (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Make an obesity assessment by using adiposity indices of WC, WHR, WHER. 5
2. Make an assessment of Chronological age when your date of birth is 07/09/1975 and the test date is 15/01/2016. 5
3. A person's weight is 57 kg. His height is 162 cm. Find out the BMI index and to which category he belongs to. 5
4. Viva-Voce. 5
5. Record. 5

V-365-02



IV-UG-Anth(CC)-X (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Draw a pedigree chart of your family. 5
2. Prepare a schedule for conducting a research work in field. 5
3. Give a case study of a person you like, with special stress on any unusual character which has attracted your attention. 5
4. Viva-Voce. 5
5. Record. 5

- c) Fit a Poisson distribution to the following data which gives the number of doddens in a sample of cloverseeds.

No. of doddens (x)	0	1	2	3	4	5	6	7	8
Observed frequency (f)	71	112	117	57	27	11	3	1	1

- d) If X is a normal variate with mean 30 and S.D. 5, find

i) $P(26 \leq X \leq 40)$

ii) $P(X \geq 45)$

iii) $P(|X - 30| > 5)$

2. Viva-Voce. 4

3. Record. 3

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: 9×2

- a) Fit a binomial distribution to the following data :

X	0	1	2	3	4
Y	28	62	46	10	4

- b) An Urn contains 5 white, 7 red and 8 black balls. If your balls are drawn one by one with replacement, what is the probability that :

i) All are white ?

ii) Only 3 are white ?

iii) None is white ?

iv) At least three are white.

f) Compare the EMF^{S1} of a given pair of cells using potentiometer.

2. Viva-Voce. 6

3. Record. 4

V-387-0.3



2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

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

- a) i) Determine resistance capacitance and D.C. voltage using digital multimeter.
- ii) Verify laws of series and parallel grouping of resistances and capacitances.
- b) Verify laws of series and parallel grouping of resistances using meterbridge.
- c) Determine the low resistance of a supplied specimen using Carry-Foster's bridge.
- d) Compare the two gire capacitances by using De-Sauty's bridge.
- e) Determine the horizontal component of Earth's magnetic field.

- c) Write a C program to find the root of an equation by Newton Raphson Method.
3. Answer any **one** of the following: 5
- a) Write a program in C for Gauss-Jacobi method.
- b) Write a C program for LU decomposition method for a given matrix.
- c) Write a C program for Lagrange Interpolation.
- d) Write a program in C for Simpson's rule for integration.
4. Record. 4
5. Viva-Voce. 6

V-364-0.4

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. Answer any **one** of the following: 5
- a) Write a C program to find the absolute value of an integer.
- b) Write a C program to calculate the sum
- $$\frac{1}{1} + \frac{1}{2} + \dots + \frac{1}{N}$$
- for a given N.
- c) Write a program in C that reads 100 integers and sort them in ascending order.
2. Answer any **one** of the following: 5
- a) Write a C program to find the root of an equation by Bisection method.
- b) Write a program in C to find the root of an equation by Secant method.

<i>Price</i>	<i>Discount</i>
Less than or equal to Rs.1000	2% of price
More than Rs.1000 and less than or equal to Rs.3000	10% of price
More than Rs.3000	15% of price
iv) Void display()	To display the name and price of the book after discount.

Write a main method to create an object of the class and call the above member methods.

- c) Write a Java program to initialize the seven wonders along with their locations in two different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its wonder, otherwise display "Sorry Not Found".
 - d) Write a Java program to display an Image using Applet.
 - e) Write a JDBC program to display all rows of the EMP table.
2. Record and Attendance. 4
 3. Viva-Voce. 6

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *three* of the following: 3 × 5
 - a) Write a Java program to find the sum of two integers passed as command line argument.
 - b) Define a class named **BookFair** with the following description :

String Bname	stores the name of the book.
double price	stores the price of the book.
Member Methods :	
i) BookFair()	Default constructor to initialize data members
ii) Void Input()	To input and store the name and the price of the book.
iii) Void calculate ()	To calculate the price after discount. Discount is calculated based on the following criteria.

2. Evaluate the following Dirac-delta function using Scilab.

$$\frac{1}{\sqrt{2\pi a^2}} \int \frac{e^{-(x-2)^2}}{2a^2} (x+3) dx \text{ for } a = 1, 0.1, .01$$

V-358-0.5

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Using the right programme in Scilab, solve any *one* of the following differential equations with appropriate given boundary conditions.

i) $\frac{dy}{dx} = e^{-x}$; $y = 0$ at $x = 0$.

ii) $\frac{dy}{dx} + e^{-x}y = x^2$; $y = 0$ at $x = 0$.

iii) $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = -y$; $y = 0$ at $x = 0$.

iv) $y\frac{d^2y}{dx^2} + \frac{dy}{dx} + 1 = 0$; $\frac{dy}{dx} = 0$, at $x, y = 0$

v) $2y\frac{dy}{dx} = 1$; $y = 0$ at $x = 0$

Plot the graphs in each case.

- e) Create a class employee which contains the following details :

Employee number, Employee name, Employee designation, Salary. Include a member function called getdata() to get data from user for insertion into the object and another function putdata() to display the data. Write another function increment () to increase the salaries of all employees by 30%. Store the details of 10 employees in a file **employee.txt**.

- f) Write a program to design derived class Rectangle Figure, Square Figure and Circle Figure of base class Geometric Figure. All derived classes should accept and display their respective attributes. All classes need to have the capability to compute area of respective Geometric Figure. Member function names in all classes need to be same.

2. Record and Attendance. 4

3. Viva-Voce. 6

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer **all** questions

1. Answer any **three** of the following: 3 × 5
 - a) Create a class 'time' that has separate int data member for hours, minutes and seconds. One constructor should initialize this data to 0 and another should initialize it to fixed values. Write a member function to display the time in the format 10 : 30 : 20. The final member function should add two objects of time passed as argument.
 - b) Write a program to overload function COUNT to count occurrence of an alphabet in a string of 5 characters or count the occurrence of a number in an array of size 5.
 - c) Write a C++ program to add two string object using overload + operator.
 - d) Write a program to declare two classes Rupees and Dollars. Declare object of both the classes. Convert rupees to dollars. Perform conversion using user defined conversion routines.

- d) Using MATLAB software solve and plot the solution of the following system of differential equations :

$$x'(t) = x(t) + 2y(t) - z(t)$$

$$y'(t) = x(t) + z(t)$$

$$z'(t) = 4x(t) - 4y(t) + 5z(t)$$

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

V-345-0.4

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

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

a) Use MATLAB software to solve the differential equation $y'(x) = xy$, with boundary condition $y(1) = 1$.

b) A colony of bacteria is growing exponentially. At time $t = 0$ it has 20 bacteria in it, and at time $t = 5$ it has 2000. At what time will it have 100,000 bacteria ? Write the theory and use MATLAB Software to plot the graph.

c) Using MATLAB software solve the IVP

$$y''(t) + 8y'(t) + 2y(t) = \cos t ;$$

$$y(0) = 0, y'(0) = 1$$

Also plot the graph.

[2]

- g) Determine dispersive power of a plane diffraction grating.
- h) Determine the resolving power of plane diffraction grating.

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

V-339-0.5



II-UG-Phy(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *one* of the following : 15
- a) Determine refractive index of material of prism by using sodium source.
- b) Determine Cauchy's constants 'A' and 'B' using prism and mercury source.
- c) Determine the wavelength 'X' of sodium source using Michelson's interferometer.
- d) Determine the wavelength 'X' of a supplied source using Fresnel's Biprism.
- e) Determine the wavelength 'X' of a given source using Newton's ring.
- f) Determine the wavelength 'X' of a given source using plane diffraction grating.

V-339

[Turn Over

7. Using a Ballistic Galvanometer, determine the value of a high resistance by the method of leakage.

Record	04
Viva-Voce	06
Experiment	15

V-328-0.5

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks
Answer any *one* of the following experiment

- Using a digital multimeter, measure (i) at least six(6) resistances and verify the laws of series and parallel combination (ii) at least six(6) capacitors and verify the laws of series and parallel combination.
- Determine an unknown low resistance using potentiometer.
- Determine an unknown low resistance using CF bridge.
- Compare capacitances using deSauty's bridge.
- Verify Thevenin and Norton theorems.
- Verify the superposition and maximum power transfer theorems.

- e) Determine the horizontal component of earth's magnetic field.
- f) Compare the EMFs of a given pair of cells using Potentiometer.

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

V-339-0.9

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *one* of the following : 15
- a) i) Determine the resistance (R), capacitance (C) and D.C. voltage of given specimens using digital multimeters.
- ii) Verify laws of series and parallel combination of supplied resistances and capacitances.
- b) Verify laws of series and parallel grouping of resistances using meterbridge.
- c) Determine the low resistance of a supplied specimen using Carry-Foster's bridge.
- d) Compare the capacitances of a supplied pair of capacitors using De-Sauty's bridge.

- e) Determine the horizontal component of earth's magnetic field.
- f) Compare the EMFs of a given pair of cells using Potentiometer.

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

V-339-0.9

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Answer any *one* of the following : 15
- a) i) Determine the resistance (R), capacitance (C) and D.C. voltage of given specimens using digital multimeters.
- ii) Verify laws of series and parallel combination of supplied resistances and capacitances.
- b) Verify laws of series and parallel grouping of resistances using meterbridge.
- c) Determine the low resistance of a supplied specimen using Carry-Foster's bridge.
- d) Compare the capacitances of a supplied pair of capacitors using De-Sauty's bridge.

IV-UG-Chem(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Recrystallise the supplied benzoic acid. Determine its m.p. and yield. 15

OR

Prepare 2, 4-dinitrophenyl hydrazone of supplied aldehyde/ketone. Determine its m.p. and yield.

OR

Prepare benzoyl derivative of the supplied amines/phenols. Determine its m.p and yield.

2. Viva-Voce. 6
3. Record 4

IV-UG-Chem(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Recrystallise the supplied benzoic acid. Determine its m.p. and yield. 15

OR

Prepare 2, 4-dinitrophenyl hydrazone of supplied aldehyde/ketone. Determine its m.p. and yield.

OR

Prepare benzoyl derivative of the supplied amines/phenols. Determine its m.p and yield.

2. Viva-Voce. 6
3. Record 4

IV-UG-Psy(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Demonstrate experimentally the learning curve as a function of learning trials using Nonsense syllables. 12

OR

Find out experimentally the 'Serial position' Effect on memory in learning a list of nonsense syllables.

2. Record. 5
3. Viva-Voce. 8

V-392-0.4



IV-UG-Chem(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Recrystallise the supplied benzoic acid. Determine its m.p. and yield. 15

OR

Prepare 2, 4-dinitrophenyl hydrazone of supplied aldehyde/ketone. Determine its m.p. and yield.

OR

Prepare benzoyl derivative of the supplied amines/phenols. Determine its m.p and yield.

2. Viva-Voce. 6
3. Record 4

V-388-1.5



d) 'Stratified random sampling is always superior to simple random sampling'. Prove.

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

V-367-0.1

**2018**

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions1. Answer any *two* of the following : 9 × 2

- a) The following table presents the summary of data for complete census of all the 2,010 farms in a region. The farms were stratified according to farm-size in acres into seven strata, as shown in Col.2 of the table. The number of farms in the different strata N_i are given in the Col.3. The population values of the strata means for the area under wheat (\bar{Y}_{N_i}) and those of strata standard deviations for the area under wheat (S_i) are given in the subsequent columns.

Stratum No.	Farm size (in Acres)	No. of farms N_i	Average area under wheat per farm in Acres (\bar{Y}_{N_i})	St. Deviation of area under wheat per farm in Acres (S_i)
1	0-40	394	5.4	8.3
2	41-80	461	16.3	13.3

[2]

3	81-120	391	24.3	15.1
4	121-160	334	34.5	19.8
5	161-200	169	42.1	24.5
6	201-240	113	50.1	26.0
7	More than 240	148	63.8	35.2

Calculate the sampling variance of the estimated area under wheat for the region from a sample of 150 farms.

- i) If the farms are selected by the method of SRS without stratification.
- ii) If the farms are selected by the method of SRS within each stratum and allocated in proportion to (a) the no. of farms in each stratum N_i and (b) the product $N_i S_i$.

Also find the sample sizes of each stratum under (a) and (b). Also obtain the gain in efficiency resulting from the later two procedures of sampling as compared with unstratified simple random sampling.

- b) The data in the following table are for small artificial population which exhibits a fairly steady rising trend. Each column represents a systematic

[3]

sample and the rows are the strata. Compare the precision of systematic sampling, random sampling and stratified sampling.

Data for 10 systematic samples with

$$n = 4, k = 10, M = nk = 40.$$

Strata	Systematic Sample Number									
	1	2	3	4	5	6	7	8	9	10
I	0	1	1	2	5	4	7	7	8	6
II	6	8	9	10	13	12	15	16	16	17
III	18	19	20	20	24	23	25	28	29	27
IV	26	30	31	31	33	32	35	37	38	38

- c) In Stratified Random Sampling with given cost function of the form :

$$c = \theta + \sum_{i=1}^k C_i n_i \text{ as defined as follows}$$

$$c = \theta + \sum_{i=1}^k C_i n_i, \text{ var}(\bar{y}_{st}) \text{ is minimum}$$

$$\text{if } n_i \propto \frac{N_i S_i}{\sqrt{C_i}}$$

prove it.

IV-UG-Stat(CC)-X(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 : 9×2

a) Using Ratio to trend method, determine the quarterly seasonal ideas for the adjoining data :

	I Qt.	II Qt.	III Qt.	IV Qt.
1995	30	40	36	34
1996	34	52	50	44
1997	40	58	54	48
1998	54	76	68	62
1999	80	92	86	82

[2]

- b) Calculate seasonal indices by the ratio to moving average method from the following data :

Year Quarter	2001	2002	2003	2004
Q ₁	75	86	90	100
Q ₂	60	65	72	78
Q ₃	54	63	66	72
Q ₄	59	80	85	93

- c) Given the following data where p and q respectively stand for price and quantity and subscripts stand for time period. Find x, if the ratio between Laspeyre's (L) and Passche's (P) index no. is $L : P :: 28 : 27$.

	Commodities	
	A	B
p ₀	1	1
q ₀	10	5
p ₁	2	x
q ₁	5	2

[3]

- d) Construct the wholesale price index no. for 2004 and 2005 from the data given below using 2003 as the base year.

Commodity	Wholesale price (in '00 Rs.) per quintal		
	2003	2004	2005
A	140	160	190
B	120	130	140
C	100	105	108
D	75	80	90
E	250	270	300
F	400	420	450

2. Via-Voce. 4
3. Record. 3

V-378-0.1



- b) Fit a Poisson distribution to the following data which gives the number of doddens in a sample of clover seeds.

No. of doddens (x)	0	1	2	3	4	5	6	7	8
Observed frequency (f)	56	156	136	92	37	22	4	0	1

- c) Given the hypothetical distribution :

No. of cells (x)	0	1	2	3	4	5	Total
Frequency (f)	213	128	37	18	3	1	400

Fit a negative binomial distribution and calculate the expected frequencies.

- d) In a distribution exactly normal, 10.03% of the item are under 25 kilogram weight and 89.97% of the items are under 70 kilogram weight. What are the mean and standard deviation of the distribution.

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

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 : 9×2

- a) Seven Coins are tossed and number of heads noted. The experiment is repeated 128 times and the following distribution is obtained :

No. of heads	0	1	2	3	4	5	6	7	Total
Frequencies	7	6	19	35	30	23	7	1	128

Fit a binomial distribution assuming :

- i) The coin is unbiased
- ii) The nature of the Coin is not known
- iii) Probability of head for four coins is 0.5 and for the remaining three coin is 0.45.

- c) Given $\log_{10} 654 = 2.8156$, $\log_{10} 658 = 2.8182$,
 $\log_{10} 659 = 2.8189$, $\log_{10} 661 = 2.8202$
 Find by Lagrange's interpolation formula
 $\log_{10} 656$.
- d) Evaluate $\log_e 7$ by Simpson's (i) 1/3rd and
 (ii) 3/8th rule.

2. Viva-voce. 4
3. Record. 3

V-325-0.1

**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 : 9×2

- a) From the following table of yearly premiums for policies maturing at quinquennial ages, estimate the premiums for policies maturing at the age 46 years.

Age (x)	45	50	55	60	65
Premium (Ux)	2.871	2.404	2.083	1.862	1.712

- b) The following table gives the Census population of a town for the year 1961 to 2001. Estimate the population for the year 1995 by using an appropriate formula.

Year	1961	1971	1981	1991	2001
Population (in lakhs)	36	66	81	93	101

c) Use the Neyman-Pearson lemma to obtain the region for testing $\theta = \theta_0$ against $\theta = \theta_1 > \theta_0$ and $\theta = \theta_1 < \theta_0$, in the case of a normal population $N(\theta, \delta^2)$, where δ^2 is known. Hence find the power of the test.

d) Given the frequency function :

$$f(x, \theta) = \begin{cases} \frac{1}{\theta} & ; 0 \leq x \leq \theta \\ 0 & , \text{ elsewhere} \end{cases}$$

and that you are testing the null hypothesis $H_0 : \theta = 1$ against $H_1 : \theta = 2$, by means of a single observed value of x . What would be the sizes of the type-I and type-II errors, if you choose the interval (i) $0.5 \leq x$, (ii) $1 \leq x \leq 1.5$ as the critical regions ? Also obtain the power function of the test.

2. Viva-Voce. 4

3. Record. 3

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 : 9 × 2

a) Describe likelihood ratio test and state its important properties.

Let x_1 and x_2 be $N(\mu_1, \delta^2)$ and $N(\mu_2, \delta^2)$ respectively where the means and variance are unspecified. Develop LR test for testing

$$H_0 : \mu_1 = \mu_2 \text{ against } H_1 : \mu_1 \neq \mu_2.$$

b) The win-loss record of a certain basketball team for their last 50 consecutive games was as follows :

W W W W W W L W W W W W W L W L W W W
L L W W W W L W W W L L W W W W W W L L
W W L L L W W L W W W

Apply run test to test that sequence of wins and losses is random.

II-UG-Anth(CC)-III (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What were the tools techniques used by pre-historic men ? 10
2. Identify, Interpret and draw of these given tools. 5
3. Record. 5
4. Viva-Voce. 5

V-323-0.1



II-UG-Anth(CC)-IV (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. Take the maximum cranial length and breadth of the given skull. Write down its procedures and land marks. 5
2. Recognise the given long bone. Find out its length and least circumference. Find out caliber index. 5
3. Fin out the following indices : 5
 - a) Cranial index
 - b) Nasal index.
4. Lab Record. 5
5. Viva-Voce. 5

V-334-0.1



IV-UG-Edn(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is 'blue print' ? Prepare a blue print of 3 dimension giving weightage to objectives, content and different forms of objective tests. 10

OR

Prepare 20 objective based objective type questions (Take any two objectives).

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

IV-UG-Edn(GE)-II (Pr)

2018

Full Marks - 25

Time - 6 Hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. What is 'blue print' ? Prepare a blue print of 3 dimension giving weightage to objectives, content and different forms of objective tests. 10

OR

Prepare 20 objective based objective type questions (Take any two objectives).

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