

CLASS: XII

HOLIDAYS HOMEWORK 2024-25

ENGLISH CORE

Assignment 1- Writing skills

1. Every year on Children's Day, an exhibition of Science Projects is held at the Indira Gandhi Indoor stadium. Your school has received an invitation from the Education Minister of Delhi inviting the students of your school to visit it. Write a notice in about 50 words informing the students about the display, advising them to go and enjoy it. You are Sunil/Sunita Sahoo, Headboy/Headgirl, Bright Minds Public School, New Delhi.
2. An inter class drama competition is to be held in St. Stephens School, Visakhapatnam. As Akash, headboy of the school, draft a notice to be put up on the school notice board inviting entries in about 50 words. Provide all necessary details
3. Draft an Admission Notice on behalf of the Principal, Dalhousie Public School announcing the commencement of admissions for nursery and Prep classes. invent all necessary details.
4. On account of the Delhi Bandh announced by the Opposition Party, the Principal of St. George's school decided to declare a holiday on 20th May, 2021. But in lieu of it, the following Saturday would be a full working day. Draft a notice on his behalf giving necessary details.
5. You are Rishi/Rishika, resident of Sagar Apartments, Basant Lok, New Delhi. The public transport facility in and around your locality is extremely poor. The nearest bus stand is at least 2 km from your apartments, causing a lot of inconvenience to the residents. write a letter to the editor of a national daily drawing the attention of the concerned authorities to rectify this problem.
6. You are arun/Arunima of 24, Nizam lane, Hyderabad. Draft an application for the post of an accountant in Suresh Ltd Co., 10, Tipu Sultan Towers, Hyderabad in response to their advertisement that appeared in The Times of India dated 1st May, 2024. Prepare a biodata to be enclosed.
7. Pramod Suri, a resident of 245, Tilak Nagar, Delhi reads an advertisement for young school boys/girls to market the products of a renowned company in Delhi. He decides to apply for the same. Write Pramod's application to the Personnel Manager, Harrison and Simpson Ltd. 237, Nehru Place, New Delhi.

Assignment 2- Literature

1. What is the misadventure that Douglas speaks about?
2. What was behind Douglas's purpose to visit Lake Wentworth in New Hampshire?
3. What news does M. Hamel break to his students?
4. Justify the title 'The Last Lesson'.
5. Garbage to them is gold. Why does the author say so about the rag pickers?
6. What was the reaction of Mukesh's family to their poverty?
7. Why did the Peddler wear an incredulous expression in the Crofter's home?
8. Why did the peddler think of the world as a rattrap?
9. Do you see an intersection of time and space in the 'Third Level'?
10. How does Sam explain Charley's finding the Third level?
11. How different or similar are Mukesh and Saheb? 150-200 words.

Assignment -3 - RTC

1. Then he turned to the blackboard, took a piece of chalk, and, bearing on with all his might, he wrote as large as could -
1. What did he write on the blackboard?
2. What does it mean?
3. Why did he write it on the blackboard?

2. From the beginning, however, I had an aversion to the water when I was in it. This started when I was three or four years old and father took me to the beach in California.

- a. What happened to the speaker at the beach in California?
- b. What was the result of this incident?
- c. How did the author attempt to overcome the situation?
- d. What does this tell us about him?

3. Go to your place quickly, little Franz, we were beginning without you.

1. who says this and to whom
2. What does the listener see in that place that is unusual?
3. what had the listener expected from the speaker? Was he surprised?
4. what was the speaker going to begin without him?

4. . But I got mixed up on the first words and stood there, holding on to my desk, my heart beating, and not daring to look up.

- 1.what did the speaker get mixed up?
2. What was he asked to recite?
3. Why was he not able to recite?
4. What are the speaker's feelings about not learning his lessons?

5. It seemed a long way down. Those nine feet were more like ninety, and before I touched bottom my lungs were ready to burst. But when my feet hit bottom I summoned all my strength and what I thought was a great spring upwards. I imagined I would bob to the surface like a cork.

- a. Which incident is the narrator describing?
- b. What was his plan of escape?
- c. Was his plan successful?
- d. How was he saved?

6. Tiny vestiges of the old terror would return. But now I could frown and say to that terror. "Trying to scare me, eh? Well, here's to you! Look!"And off I'd go for another length of the pool.

1. Which old terror is he referring to?
2. Why does he call it 'old terror'?
3. Had he overcome his old terror? If yes, how? If no, why?

7. For once on the face of the Earth
Let's not speak in any language,
Let's stop for one second,
And not move our arms so much.

- (a) What does the poet appeal for?
- (b) To attain this, what does he expect all of us to do?
- (c) Why does he advocate silence?
- (e) What kind of activity does the poet feel the man is involved with?

8. It would be an exotic moment
Without rush, without engines,
We would all be together
in a sudden strangeness.
Fishermen in the cold sea
Would not harm whales
And the man gathering salt
Would look at his hurt hands.

- (a) What does he mean by 'exotic moment'?
- (b) How could man achieve this exotic moment?
- (c) What kind of a feeling would this exotic moment evoke?
- (d) What harm do the fishermen do and why do salt gatherer's hands hurt?

9. Those who prepare green wars,
Wars with gas, wars with fire,
Victory with no survivors
Would put on clean clothes
And walk about with their brothers
In the shade, doing nothing.

- (a) What are the kinds of wars mentioned in the above lines?
- (b) What are green wars?
- (c) How would the wars affect our lives?
- (d) What could be the ideal situation?

10. What I want would not be
Confused With total inactivity.
Life is what it is about;
I want no truck with death.
If we were not so single-minded about keeping our lives moving,
and for once could do nothing,
Perhaps a huge silence
Might interrupt this sadness
Of never understanding ourselves

And of threatening ourselves with death.

- (a) What does the poet mean by inactivity?
- (b) How is inactivity different from death?
- (c) What makes us sad and what are we single-minded about?
- (d) What does the poet mean by 'to have no truck with death'?

11. Perhaps the Earth can teach us
As when everything seems dead
And later proves to be alive.
Now I'll count up to twelve
And you keep quiet and I will go

- (a) What can the Earth teach us?
- (b) How does it teach us this lesson?
- (c) How does the Earth 'prove to be alive'?
- (d) What is the poet's appeal?

COMMERCIAL ARTS

Make five Illustrations on the following topics:

Size - A2

1. Metro/Railway station
2. Shopping Mall / Market Scene
3. Visit to Historical Place
4. Picnic Spot
5. Sports Event

Design a Book Jacket Cover - Size A2

ACCOUNTANCY

- Q State the conditions under which capital balances may change under the system of a Fixed Capital Account.
- Q A is partner in a firm. His capital as on Jan 01, 2019 was Rs.60,000. He introduced additional capital of ₹ . 20,000 on Oct 01 2019. Calculate interest on A's capital @ 9% p.a.
- Q. Alka, Barkha and Charu are partners in a firm having no partnership agreement. Alka, Barkha and Charu contributed ₹ . 20,000, ₹ . 30,000 and ₹ . 1,00,000 respectively. Alka and Barkha desire that the profit should be divided in the ratio of capital contribution. Charu does not agree to this. How will you settle the dispute.
- Q. A and B are partners in a firm without a partnership deed. A is an active partner and claims a salary of ₹ . 18,000 per month. State with reason whether the claim is valid or not.

Q. Chandar and Suman are partners in a firm without a partnership deed. Chandar's capital is ₹ 10,000 and Suman's capital is ₹ 14,000. Chandar has advanced a loan of ₹ 5,000 and claim interest @ 12% p.a. State whether his claim is valid or not.

Q.6 R, S, and T entered into a partnership of manufacturing and distributing educational CD's on April 01, 2016. R looked after the business development, S content development and T financed the project. At the end of the year (31-03-2017) T wanted an interest of 12% on the capital employed by him. The other partners were not inclined to this. How would you resolve this within the ambit of the Indian Partnership Act, 1932?

Q. A, B and C are partners in a firm. A withdrew ₹ 1,000 in the beginning of each month of the year. Calculate interest on A's drawing @ 6% p.a.

Q. A, B and C are partners in a firm, B withdrew ₹ 800 at the end of each month of the year. Calculate interest on B's drawings @ 6% p.a.

Q. A, B and C are partners in a firm. They have omitted interest on capital @ 10% p.a. for three years ended 31st March 2017. Their fixed capitals on which interest was to be calculated through –out were

A	₹ 1,00,000
B	₹ 80,000
C	₹ 70,000

Give the necessary Journal entry with working notes.

Q. X, Y, and Z are partners sharing profits and losses in the ratio of 3:2:1. After the final accounts have been prepared it was discovered that interest on drawings @ 5% had not been taken into consideration. The drawings of the partner were X ₹ 15,000, Y ₹ 12,600, Z ₹ 12,000. Give the necessary adjusting Journal entry.

Q. A, B and C are partners sharing profits and losses in the ratio of 3:2:1. Their fixed capitals are ₹ 1,50,000, ₹ 1,00,000 and ₹ 80,000 respectively. Profit for the year after providing interest on capital was ₹ 60,000, which was wrongly transferred to partners equally. After distribution of profit it was found that interest on capital provided to them @ 10% instead of 12%. Pass necessary adjustment entry. Show your working clearly.

Q. Ravi and Mohan were partner in a firm sharing profits in the ratio of 7:5. Their respective fixed capitals were Ravi ₹ 10,00,000 and Mohan ₹ 7,00,000. The partnership deed provided for the following:-

(i) Interest on capital @ 12% p.a.

(ii) Ravi's salary ₹ 6,000 per month and Mohan's salary ₹ 60,000 per year.

The profit for the year ended 31-03-2007 was ₹ 5,04,000 which was distributed equally without providing for the above. Pass an adjustment Entry.

Q. X, Y and Z are sharing profits and losses in the ratio of 5:3:2. They decide to share future profits and losses in the ratio of 2:3:5 with effect from 1st April, 2012. They also decide to record the effect of the reserves without affecting their book figures, by passing a single adjusting entry.

	Book Figure (₹)
General Reserve	40,000
Profit 2 loss A/C (Cr)	10,000

Advertisement Suspense A/C(Dr)

20,000

Pass the necessary single adjusting entry.

Q. A, B and C were partners in the ratio of 5:4:1. On 31st Dec. 2016 their balance sheet showed a reserve fund of ₹ . 65,000, P&L A/C (Loss) of ₹ 45,000. On 1st January, 2017, the partners decided to change their profit sharing ratio to 9:6:5. For this purpose goodwill was valued at ₹ 1,50,000.

The partners do not want to distribute reserves and losses and also do not want to record goodwill. You are required to pass single journal entry for the above.

Q. On what occasions does the need for valuation of goodwill arise?

Q. Why is it necessary to revalue assets and reassess liabilities at the time of admission of new partner?

Q. What is meant by sacrificing ratio?

Q. State two occasions when sacrificing ratio may be applied.

Q. A business has earned average profit of ₹ . 60,000 during the last few years. The assets of the business are ₹ 5,40,000 and its external liabilities are ₹ . 80,000. The normal rate of return is 10%. Calculate the value of goodwill on the basis of capitalisation of super profits.

Q. The capital of a firm of Arpit and Prajwal is ₹ . 10,00,000. The market rate of return is 15% and the goodwill of the firm has been valued ₹ 1,80,000 at two years purchase of super profits. Find the average profits of the firm.

Q. The average profits for last 5 years of a firm are ₹ . 20,000 and goodwill has been worked out ₹ 24,000 calculated at 3 years purchase of super profits. Calculate the amount of capital employed assuming the normal rate of interest is 8 %.

Q. Rahul and Sahil are partners sharing profits together in the ratio of 4:3. They admit Kamal as a new partner. Rahul surrenders 1/4th of his share and Sahil surrenders 1/3rd of his share in favour of Kamal. Calculate the new profit sharing ratio.

Q. Ajay and Naveen are partners sharing profits in the ratio of 5:3. Surinder is admitted in to the firm for 1/4th share in the profit which he acquires from Ajay and Naveen in the ratio of 2:1. Calculate the new profit sharing ratio.

Q. A and B were partners sharing profits in the ratio of 3:2. A surrenders 1/6th of his share and B surrenders 1/4th of his share in favour of C, a new partner. What is the new ratio and the sacrificing ratio.

Q. Aarti and Bharti are partners sharing profits in the ratio of 5:3. They admit Shital for 1/4th share and agree to share between them in the ratio of 2:1 in future. Calculate new and sacrificing ratio.

Q. X and Y divide profits and losses in the ratio of 3:2. Z is admitted in the firm as a new partner with 1/6th share, which he acquires from X and Y in the ratio of 1:1. Calculate the new profit sharing ratio of all partners.

Q. Rakhi and Parul are partners sharing profits in the ratio of 3:1. Neha is admitted as a partner. The new profit sharing ratio among Rakhi, Parul and Neha is 2:3:2. Find out the sacrificing ratio.

Q. X and Y are partners sharing profits in the ratio of 5:4. They admit Z in the firm for $\frac{1}{3}$ rd profit, which he takes $\frac{2}{9}$ th from X and $\frac{1}{9}$ th from Y and brings ₹ . 1500 as premium. Pass the necessary Journal entries on Z's admission.

Q. Ranzeet and Priya are two partners sharing profits in the ratio of 3:2. They admit Nilu as a partner, who pays ₹ . 60,000 as capital. The new ratio is fixed as 3:1:1. The value of goodwill of the firm was determined at ₹ 50,000. Show journal entries, if Nilu brings goodwill for her share in cash.

Q. A and B are partners sharing profits equally. They admit C into partnership, C paying only ₹ 1,000 for premium out of his share of premium of ₹ 1,800 for $\frac{1}{4}$ th share of profit. Goodwill account appears in the books at ₹ . 6,000. All the partners have decided that goodwill should not appear in the new firms books.

Q. A and B are partners sharing profits in the ratio of 3:2. Their books showed goodwill at ₹ . 2,000. C is admitted with $\frac{1}{4}$ th share of profits and brings Rs. 10,000 as his capital but is not able to bring in cash goodwill ₹ 3,000. Give necessary Journal entries.

Q. A and B are partners with capital of ₹ . 26,000 and ₹ 22,000 respectively. They admit C as partner with $\frac{1}{4}$ th share in the profits of the firm. C brings ₹ 26,000 as his share of capital. Give journal entry to record goodwill on C's admission.

Q. A and B are partners sharing profits in the ratio of 3:2. They admit C into partnership for $\frac{1}{4}$ th share. C is unable to bring his share of goodwill in cash. The goodwill of the firm is valued at ₹ 21,000. give journal entry for the treatment of goodwill on C's admission.

Q. A and B are partners with capitals of ₹ 13,000 and ₹ 9,000 respectively. They admit C as a partner with $\frac{1}{5}$ th share in the profits of the firm. C brings ₹ . 8,000 as his capital. Give journal entries to record goodwill.

Q. A and B were partners in the ratio of 3:2. They admit C for $\frac{3}{13}$ th share. New profit ratio after C's admission will be 5:5:3. C brought some assets in the form of his capital and for the share of his goodwill.

Following were the assets:

Assets	₹
Stock	2,44,000
Building	2,40,000
Plant and Machinery	1,40,000

At the time of admission of C goodwill of the firm was valued at ₹ . 12,48,000.
Pass necessary journal entries.

PSYCHOLOGY

I Prepare a case profile using assessment methods like psychological tests, interviews, case study, report narration etc. Complete all the data collection for Case Profile .Prepare the Case Profile by compiling and interpreting all information collected.

Complete the practical file work starting from introduction to intelligence testing..

II Present a portrait of any two eminent psychologists along with their theories on A4 size sheets.

The suggestive names of Psychologists are as follows:

1. Sigmund Freud
2. Abraham Maslow
3. Carl Jung
4. Raymond Catell
5. Ivan.P. Pavlov
6. Wilhelm Wundt
7. Carl Rogers
8. B.F.Skinner

III Learn the key terms given in the glossary of Unit 1(Variations in Psychological Attributes) and Unit 2 (Self and Personality)

BIOLOGY

Part - I (Human Reproduction)

(Q1 – Q10) Given below are four options against each question. Choose the option which you consider the most appropriate as your answer.

1. _____ is a lytic enzyme released by the sperm.

- a) Hyaluronidase b) Trypsin c) Helicase d) None of the above

2. How many autosomes does a human primary spermatocyte have?

- a) 34 b) 44 c) 54 d) 33

3. _____ is an organelle that helps the sperm to penetrate the ovum

- a) Acrosome b) Zona pellucida c) Megalis d) None of the above

4. Umbilical cord contains _____

- a) Pluripotent stem cells b) Cord blood stem cells c) Blood stem cells d) None of the above

5. Which of the following option shows correctly matched pairs for column I and column II

Column-I	Column-II
(P) Foetus Cells	(i) Relaxian
(Q) Placenta	(ii) Hyaluronidase
(R) Acrosome	(iii) Prostaglandins

(S) Ovary

(iv) Oxytocin

a) P-iv, Q-iii, R-ii, S-i

b) P-iii, Q-iv, R-ii, S-i

c) P-ii, Q-iii, R-iv, S-i

d) P-ii, Q-iii, R-iv, S-i

6. Cryptorchidism is a condition where _____

- a) One of both testes are not developed
- b) One or both testes fail to descend into the scrotum
- c) One or both testes are not formed
- d) None of the above

7. Acrosome is made up of _____

- a) Lipids
- b) Hormones
- c) Digestive enzymes
- d) None of the above

8. _____ is an example of a viviparous animal.

- a) Goat
- b) Duck
- c) Crocodile
- d) None of the above

9. The _____ is a temporary organ that connects a mammalian mother to its fetus

- a) Placenta
- b) Chorion
- c) Endometrium
- d) None of the above

10. Fertilization in human takes place in

- a) Vagina
- b) Uterus
- c) Ampullary-isthmic junction
- d) Infundibulum

Answer the following questions:

11. Write the effect of high concentration of LH on a mature Graafian follicle.

12. Write the differences between in morula and blastocyst.

13. Draw a labeled diagram of a female reproductive system.

14. Why parturition called a neuro-endocrine mechanism? Explain.

15. Write in proper sequence, the major events in human reproduction.

16. Explain the ovarian and uterine events that occur during a menstrual cycle in a human female under the influence of pituitary and ovarian hormones respectively.

17. (a) Draw a labeled diagram of a male reproductive system. (b) What is structure and function of sperm? (c) What are the accessory glands present in male reproductive system? State their function.

18. Medically, it is advised to all young mothers that breastfeeding is the best for their newborn babies. Do you agree? Give a reason in your support of your answer.

19. During the reproductive cycle of a human female when, where and how does a 3 placenta develop? What is the function of the placenta during pregnancy and embryo development?

20. Differentiate between spermatogenesis and oogenesis based on

(a) Time of initiation of the process

(b) Site of completion of process

(c) Nature of meiotic division undergone by gamete mother cells

Note- Do these questions in Bio Register.

Part 2 – Prepare Investigatory Project in Biology

As discussed in the class.

CHEMISTRY

1. Attempt all the questions given in the assignment. The questions are based on the chapters: Solutions & Electrochemistry.
2. You are expected to write following 2 experiments done in the lab in the lab file.
 - (a) Prepare 25 mL of M/20 ferrous ammonium sulphate solution.
 - (b) Determine the molarity and strength of given KMnO_4 solution by titrating it against prepared ferrous ammonium sulphate solution.
3. Read the following instructions carefully:
 - Purchase a new lab file having around 200 pages. Do not write in the old file as it carries a weightage of 5 marks and will be evaluated by CBSE examiner.
 - Write in **legible handwriting** with a **blue gel or ink pen** on the ruled sheets and with a pencil on blank pages.
 - Headings and sub-headings shall be written with a different color ink and may be underlined with scale.
4. Search for an investigatory project and get it approved in July when school reopens.

SOLUTIONS

Q1) What is the expected value of Vant` Hoff Factor for

1) $K_3[Fe(CN)_6]$ 2) K_2SO_4 in dilute solution?

Q2) Of 0.1 molal solution of glucose and NaCl respectively, which one will have a higher boiling point?

Q3) A and B liquids on mixing produce a warm solution. Which type of deviation is there and why?

Q4) Two liquids A and B boil at 145°C and 190°C respectively. Which of them has a higher vapour pressure at 80°C ?

Q5) When 30mL of ethyl alcohol and 30mL of water are mixed, the volume of resulting solution is more than 60mL. Which type of deviation does it show? Give reason.

Q6) What would be the value of Vant` Hoff factor if a solute is 50% dissociated?

Q7) Why is the elevation in boiling point of water different in the following solutions?

1) 0.1 molar of NaCl solution 2) 0.1 molar sugar solution.

Q8) Mention a large scale use of the phenomenon of reverse osmosis.

Q9) What is the value of i if the solute molecules undergo

1) association 2) dissociation 3) neither association nor dissociation ?

Q10) There is elevation in boiling point by addition of a non volatile solute. Explain Why? Describe how the molecular mass of a substance can be determined on the basis of elevation in boiling point measurement?

Q11) Draw a suitable diagram to express the relationship between vapour pressure and mole fractions of ideal solutions containing two components A and B at constant temperature?

Q12) A solution of 3.8g of sulphur in 100g of CS_2 (b.pt = 46.3°C) boils at 46.6°C . What is the formula of sulphur molecule in this solution? K_b for $CS_2 = 2.40 \text{ k kg mol}^{-1}$ (Ans= S_8)
atomicity = 8)

Q13) For determining molar masses of macromolecular substances in solution, the osmotic pressure measurement is preferred over measurement method from other colligative properties of solution. Give two reasons.

Q14) Give one example each of miscible liquid pairs showing +ve and -ve deviation from Raoult's Law. Give reason for such deviations.

Q15) Are equimolar solutions of sodium chloride and urea isotonic? Why?

Q 16) The solubility of $\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ in water at 288 K is 5.6g per 100g of water. What is the molality of hydroxide ions in saturated solution of $\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ at 288 K? (Atomic mass of Ba = 137u)

Q17 Differentiate between molarity and molality for a solution. How does a change in temperature influence their values?

Q18) Calculate the freezing point of an aqueous solution containing 10.50g of MgBr_2 in 200g of water (molar mass of $\text{MgBr}_2 = 184\text{g}$, K_f for $\text{H}_2\text{O} = 1.86 \text{ K kg mol}^{-1}$)

Q19) Define the terms osmotic pressure and osmosis. Why osmotic pressure of a solution is a colligative property? Explain.

Q20) Calculate the boiling point of a solution prepared by adding 15.00g of NaCl to 250 g of H_2O ($K_b = 0.512 \text{ K kg mol}^{-1}$)

Q21) 2g of benzoic acid dissolved in 25g of benzene shows a depression in freezing point equal to 1.62K. Molal depression constant for benzene is $4.9 \text{ K kg mol}^{-1}$. What is the % association of acid if it forms dimer in solution?

(Ans: - = 99.16%)

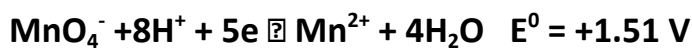
Electrochemistry

Q1. (i) (a) Depict the galvanic cell in which $\text{Al} + 3\text{Cu}^+ \rightleftharpoons \text{Al}^{3+} + 3\text{Cu}$ takes place.

b) Which electrode is negatively charged?

(c) Write the reactions taking place at each electrode.

Q2. Two half-reactions of electrochemical cells are given below:

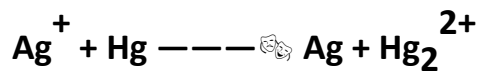


Construct the redox reaction from the standard potential of the cell and predict if the reaction is reactant favoured or product favoured.

Q3. Why is equilibrium constant related to E^0_{cell} not E_{cell} ?

Q4 Blue colour of copper sulphate is slowly discharged when an iron rod is dipped in to it. Explain this by calculating ΔG^0

Q5 For the reaction :



$$E^\circ = 0.80 \text{ V} \quad E^\circ = 0.79 \text{ V}$$

Predict the direction in which the reaction will proceed if :

$$[\text{Ag}^+] = 10^{-1} \text{ mol/l} \quad [\text{Hg}_2^{2+}] = 10^{-3} \text{ mol/l}$$

Q6 For a cell,



- (I) Write the net cell reaction.
- (II) Calculate the e.m.f. at 25 °C.
- (III) Will the cell generate e.m.f. when the concentrations become equal?

PHYSICS

Q.1 When the charge of a body becomes half, the electric field becomes a) Half b) Twice c) Thrice d) No change

Q.2 An electrical dipole is placed in a uniform electric field with the dipole axis making an angle θ with the direction of electrical field. The orientation of the dipole for stable equilibrium is:

a) $\pi/6$ b) $\pi/3$ c) 0 d) $\pi/2$

Q.3 Electric lines of force about a positive point charge are:

- (a) radially outwards (b) circular clockwise
(c) radially inwards (d) parallel straight lines

Q.4 Which of the following is false for electric lines of force?

(a) They always start from positive charge and terminate on negative charges. (b) They are always perpendicular to the surface of a charged conductor. (c) They always form closed loops.

(d) They are parallel and equally spaced in a region of uniform electric field. Q.5 The

angle between area of equipotential surface and electric field is: (a) 0° (b) 90° (c) Between 0° and 90° (d) Between 90° and 180° Q.6 In a parallel plate capacitor, the capacity

increases if:

(a) area of the plate is decreased (b) distance between the plates increases (c) area of the plate is increased (d) dielectric constant decreases. Q.7 A capacitor is charged by a battery. The battery is

removed and another identical uncharged capacitor is connected in parallel. The total electrostatic

energy of resulting system:

- (a) Increases by a factor of 4. (b) decreases by a factor of 2. (c) remains the same.
 - (d) increases by a factor of 2
- Q.8 If a wire is stretched to make it double longer, its resistance will: (a) increase by 4 times (b) increase by 2 times

- (c) decrease by 4 times (d) decrease by 2 times

Q.9 The specific resistance of a conductor increases with:

- (a) increase in temperature (b) increase in cross-sectional area
- (c) decrease in length (d) decrease in cross-sectional area

Q.10 We use alloys for making standard resistors because they have: (a) low

temperature coefficient of resistivity and high specific resistance (b) high temperature coefficient of resistivity and low specific resistance (c) low temperature coefficient of resistivity and low specific resistance (d) high temperature coefficient of resistivity and high specific resistance

Q.11 Kirchoff's first law and second law are based on:

- (a) Conservation of charge, conservation of momentum
- (b) Conservation of energy, conservation of charge
- (c) Conservation of momentum, conservation of charge
- (d) Conservation of charge, conservation of energy

Q.12 Three Charges $2q$, $-q$ and $-q$ placed at vertices of a triangle of side a . The value of E and V at centroid of triangle will be:

- (a) $E \neq 0$ and $V \neq 0$ (b) $E = 0$ and $V = 0$ (c) $E \neq 0$ and $V = 0$ (d) $E = 0$ and $V \neq 0$
- Q.13 Two parallel large thin metal sheets have equal surface densities $26.4 \times 10^{-12} \text{ C/m}^2$ of opposite signs. The electric field between these sheets is:

- (a) 1.5 N/C (b) $1.5 \times 10^{-16} \text{ N/C}$ (c) $3 \times 10^{-10} \text{ N/C}$ (d) 3 N/C
- Q.14 A positively charged particle is released from rest in a uniform electric field. The electric potential energy of the charge:

- (a) remains constant because the electric field is uniform.
- (b) increases because charge moves along the electric field.
- (c) decreases because charge moves along the electric field.
- (d) decreases because charge moves opposite to the electric field.

Q.15 Two conducting wires X and Y of same diameter but different materials are

joined in series across a battery. If the number density of electron in X is twice that in Y, find the ratio of drift velocity of electrons in two wires is:

- (a) 1:2 (b) 1:1 (c) 2:1 (d) 3:2

Q.16. A battery is connected to the conductor of non-uniform cross section area. The quantities or quantity which remains constant is:

- (a) electric field only (b) drift speed and electric field

(c) electric field and current (d) current only

Q.17 A $500\mu\text{C}$ charge is at the center of a square of side 10 cm. Find the work done in moving a charge of $10\mu\text{C}$ between two diagonally opposite points on the square.

Q.18 Derive the expression for the electric potential at any point along the axial line of an electric dipole.

Q.19 Using Gauss' law, derive an expression for the electric field intensity at any point outside a uniformly charged thin spherical shell of radius R and charge density $\sigma \text{ C/m}^2$. Draw the field lines when the charge density of the sphere is (i) positive, (ii) negative.

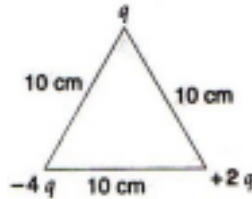
Q.20 A uniformly charged conducting sphere of 2.5 m in diameter has a surface charge density of $100 \mu\text{C/m}^2$. Calculate the

(a) charge on the sphere

(b) total electric flux passing through the sphere

Q.21 (a) Derive an expression for the torque experienced by an electric dipole kept in a uniform electric field.

(b) Calculate the work done to dissociate the system of three charges placed on the vertices of a triangle as shown.



Q.22 Which orientation of an electric dipole in a uniform electric field would correspond to stable equilibrium?

Q.23 Two metallic wires of the same material have the same length but cross-sectional area is in the ratio 1:2. They are connected (i) in series and (ii) in parallel. Compare the drift velocities of electrons in the two wires in both the cases.

Q.24 Derive an expression for the energy stored in a parallel plate capacitor. On charging a parallel plate capacitor to a potential V , the spacing between the plates halved, and a dielectric medium of ϵ_r is introduced between the plates, $10 \epsilon_r =$ without disconnecting the d.c. source.

Explain, using suitable expressions, how the (i) capacitance (ii) electric field and (iii) energy density of the capacitor change.

Q.25 A cell of emf ' E ' and internal resistance ' r ' is connected across a variable resistor ' R '. Plot a graph showing the variation of terminal potential ' V ' with resistance R .

Predict from the graph the condition under which ' V ' becomes equal to ' E '.

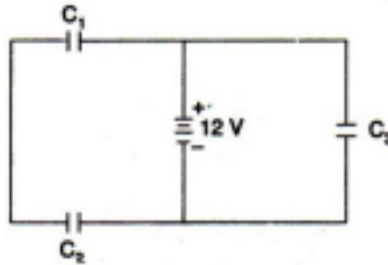
Q.26 (a) Can two equi-potential surfaces intersect each other? Give reasons.

(b) Two charges $-q$ and $+q$ are located at points A $(0, 0, -a)$ and B $(0, 0, +a)$ respectively. How much work is done in moving a test charge from point P $(7, 0, 0)$ to Q $(-3, 0, 0)$?

Q.27 Three identical capacitors C_1 , C_2 and C_3 of capacitance $6 \mu\text{F}$ each are connected to a 12 V battery as shown. Find (i) charge on each capacitor

(ii) equivalent capacitance of the network

(iii) energy stored in the network of capacitors.



Q.28 A point charge Q is placed at point as shown in the figure. Is the potential difference $V_A - V_B$ positive, negative or zero, if Q is (i) positive and (ii) negative?

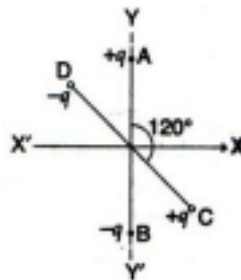


Q.29 Two uniformly large parallel thin plates having charge densities $+\sigma$ and $-\sigma$ are kept in the X-Z plane at a distance ' d ' apart. Sketch an equipotential surface due to electric field between the plates. If a particle of mass m and charge $-q$ remains stationary between the plates, what is the magnitude and direction of this field?

Q.30 Two small identical electrical dipoles AB and CD, each of dipole moment ' p ' are kept at an angle of 120° as shown in the figure. What is the resultant dipole moment

of this combination? If this system is \vec{u}_r directed along E subjected to electric field (E directed along

$+X$ direction, what will be the magnitude and direction of the torque acting on



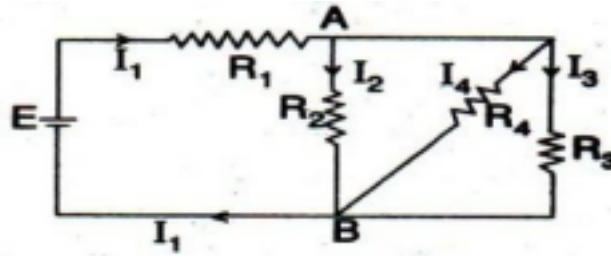
this?

Q.31 Define the terms (i) drift velocity, (ii) relaxation time.

A conductor of length L is connected to a dc source of emf \mathcal{E} . If this conductor is replaced by another conductor of same material and same area of cross-section but of length $3L$, how will the drift velocity change?

Q.32 In the circuit shown, $R_1 = 4 \Omega$, $R_2 = R_3 = 15 \Omega$, $R_4 = 30$ and $E = 10 \text{ V}$. Calculate the

equivalent resistance of the circuit and the current in each resistor.



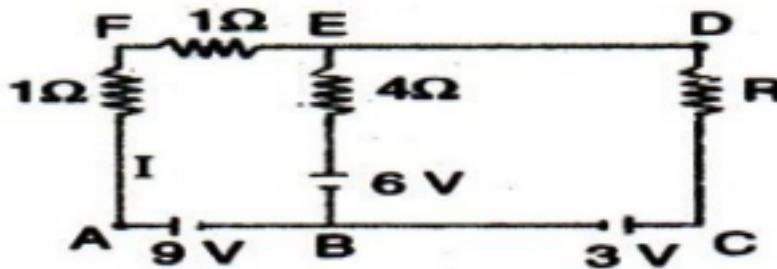
Q.33 A cell of emf E and internal resistance r is connected to two external resistance R_1 and R_2 and a perfect ammeter. The current in the circuit is measured in four different situations:

- (i) Without an external resistance in the circuit
- (ii) With resistance R_1 only
- (iii) With R_1 and R_2 in series combination
- (iv) With R_1 and R_2 in parallel combination

The currents measured in the four cases are 0.42A , 1.05A , 1.4A and 4.2A , but not necessarily in that order. Identify the currents corresponding to the four cases mentioned above.

Q.34 Draw a plot showing the variation of (i) electric field (E) and (ii) electric potential (V) with distance r due to a point charge Q .

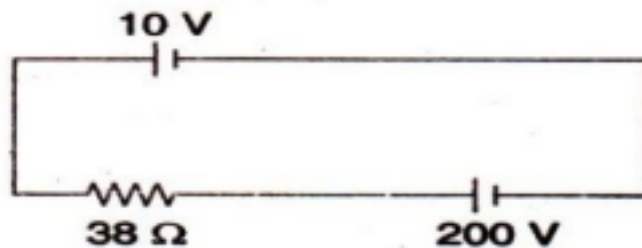
Q.35 Using Kirchhoff's rules determine the value of unknown resistance R in the circuit so that no current flows through $4\ \Omega$ resistance. Also find the potential difference between A and D .



Q.36 (a) Define electric flux. Write its S.I. units.

- (b) Using Gauss's law, prove that the electric field at a point due to a uniformly charged infinite plane sheet is independent of the distance from it.
- (c) How is the field direction if (i) the sheet is positively charged, (ii) negatively charged?

Q.37 A 10 V battery of negligible internal resistance is connected across a 200 V battery and a resistance of $38\ \Omega$ as shown in the figure. Find the value of the current in circuit.



Q.38 A capacitor of unknown capacitance is connected across a battery of V volts. The charge stored in it is $360 \mu\text{C}$. When potential across the capacitor is reduced by 120 V , the charge stored in it becomes $120 \mu\text{C}$.

Calculate:

- (i) The potential V and the unknown capacitance C .
- (ii) What will be the charge stored in the capacitor, if the voltage applied had increased by 120 V ?

Q.39 (a) State Kirchhoff's rules for an electric network. Using Kirchhoff's rules, obtain the balance condition in terms of the resistance of four arms of Wheatstone bridge.

Q.40 Two capacitors of unknown capacitance C_1 and C_2 are connected first in series and then in parallel across a battery of 100 V . If the energy stored in the two combinations is 0.045 J and 0.25 J respectively, determine the value of C_1 and C_2 . Also, calculate the charge on each capacitor in parallel combination.

ECONOMICS

Prepare a colorful mind map of covered chapters.

To be done in class notebook

INDIAN ECONOMIC DEVELOPMENT

CHAPTER- 1 Indian Economy on the eve of independence.

CHAPTER-2 Indian Economy- 1950-90

CHAPTER-3 Indian Economic Reforms 1991

ASSIGNMENT- 1

CHAPTER - DEVELOPMENT POLICIES AND EXPERIENCE (1947-1990)

- Q. While the nation had immensely benefited from the green revolution, the technology involved was not free from limitations. State these limitations.
- Q. What were the main causes of India's agricultural stagnation during the colonial period? (Any 3)
- Q. Though the public sector is very essential for industries, many public sector undertakings incur huge losses and are a drain on the economy's resources. Discuss the usefulness of public sector undertakings in the light of this fact.
- Q. Why and how was the private sector regulated under the IPR 1956?
- Q. "Green revolution enabled the government to procure sufficient food grains to build its stocks that could be used during times of shortage." Explain the statement.
- Q. "The traditional handicrafts industries were ruined under British rule." Do you agree with this view? Give reasons in support of your answer.
- Q. "India's foreign trade throughout the colonial period was the generation of a large export surplus. But this surplus came at a huge cost to the country's economy. Do you agree with this view? Give reasons in support of your answer.
- Q. Why was 'Green Revolution' technology implemented in the agricultural sector in India? How did it benefit the Indian economy?
- Q. Critically evaluate the licensing system and import substitution policy closed under the industrial and trade policies.
- Q. While subsidies encourage farmers to use new technology, they are a huge burden on government finances. Discuss the usefulness of subsidies in the light of this fact.
- Q. (a) Were there any positive contributions made by the British in India? Discuss. (b) The social benefits, which the Indian people gained due to the introduction of the railways, were outweighed by the country's huge economic loss. Explain giving reasons.

ASSIGNMENT- 2

CHAPTER- Economic Reforms since 1991

Q. Process of globalisation has produced only positive results for India and other countries. Comment.

Q. Economic reforms were widely criticized because they neglected the agriculture Sector. Do you agree? Give valid reasons.

Q. The opening up of the Indian economy has led to a rapid increase in foreign direct investments and Foreign Exchange Reserves of the country. Defend or refute the given statement.

Q. India is often called the Outsourcing destination of the world. Discuss the prime reasons for this name given to India.

Q. Discuss the objectives of WTO.

Q. Why were economic reforms needed in India in 1991? Explain.

Q. Give the list of navratna companies.

Q. State the achievements of economic reforms.

Q. What measures have been taken for globalisation for the Indian economy?

Q. Do you think the navratnas policy of the government helps in improving the performance of public sector undertakings in India? How?

Q. Why did RBI have to change its role from controller to facilitator of the financial sector in India? Explain.

Q. Economic policy of 1991 stressed on removing unnecessary restrictions and creating a more competitive environment to increase its interaction with the world economy. Which values in your opinion have been realised as per new economic policy? Explain.

Q. Discuss economic reforms in India in the light of social justice and welfare.

Q. Why has the industrial sector performed poorly in the reform process? Why?

MACRO ECONOMICS

ASSIGNMENT- 3- Money and Banking

Q. After demonetization people deposited the old currency into their bank

accounts, it will decrease the money supply in the economy. Defend or refute the statement with valid reasons.

Q. Why is money supply termed as a stock concept?

Q. Explain the functions of money.

Q. Money has overcome the drawback of the barter system. Explain.

Q. Define money supply and explain its components.

Q. What is bank money?

Q. Illustrate with the help of an hypothetical numerical example the process of credit creation.

Q. Calculate the value of money multiplier and total deposit creation if initial deposit is of Rs. 500 Crore and LRR is 10%.

Q. Distinguish between cash reserve ratio and statutory liquidity ratio.

Q. Whether the following changes by the Reserve Bank will decrease or increase the money supply? Give reasons.

- Rise in repo rate
- Purchase of security in the open market
- RBI decreased the Margin from 20% to 10%.
- RBI increases the cash reserve ratio.

Q. Credit creation is inversely related to the reserve deposit ratio. Justify the given statement using a hypothetical example.

Q. Discuss how the central bank plays the role of controller of credit in an economy.

ASSIGNMENT- 4- GOVERNMENT BUDGET AND ECONOMY

Q. How can surplus budgets be used during an inflationary period?

Q. Differentiate between revenue budget and capital budget.

Q. The government budget of a country cannot have a fiscal deficit without the existence of a revenue deficit. Defend or refute the given statement with valid arguments.

Q. Fiscal deficit is necessarily inflationary in nature. Do you agree, support your answer with valid reasons.

Q. What are non Debt creating capital receipts give two examples of such receipts.

Q. Explain how the allocation of resources can be influenced in the government budget through taxes expenditure and subsidies.

Q. Government provides essential items of food grains almost free to the families below the poverty line. Which objective the government is trying to fulfill through the government budget and how? Explain.

Q. Discuss the relationship between revenue deficit and fiscal deficit.

Q. Taxation is an effective tool to reduce the inequalities of income. Justify the given statement with valid reasons.

Q. What is the government budget? Explain its major components.

Q. Discuss briefly how the government budget can be used as an effective tool in the process of Employment generation.

Prepare Synopsis (including all terms, key words, facts ,timeline etc.)

SOCIOLOGY

PROJECT WORK

RESEARCH BASED ACTIVITY

- Project work to be completed with the guidelines provided.
- Questionnaire of 18 to 20 questions to be prepared with MCQs and duly filled and data to be tabulated
- Other sections of the project work to be completed according to the contents provided
 - a. Introduction
 - b. Review of Literature

- c. Methodology
- d. Tools and techniques used in data collection
- e. Presentation of evidence
- f. Analysis
- g. Tabulation sheet
- h. Interview
- i. Case study
- j. Conclusion
- k. Limitation of Technique
- l. Annexure
- m. Bibliography

ACADEMIC WORK

NPSC and other MCQs and assertion and reasoning questions given in Google Classroom to be done as revision.

GEOGRAPHY

- Q1 Compare humanisation of nature and naturalisation of humans along with examples.
- Q2. Write the names of five countries from the three stages of demographic transition theory. You can take the help from internet for current data and also state the characteristics of each stage.
- Q3. Make a list of countries having best HD scores and poor HD scores. Compare the status of these countries and elaborate the findings in your register. Locate the countries in the world map.
- Q4. Define mining. What are the two types of mining? Compare.

POLITICAL SCIENCE

I) PROJECT WORK: Carry out Research and prepare a 'Project file' on the topic assigned to you from the Political Science textbooks/curriculum. Keep the following points in mind:

- 1) The project should be interdisciplinary(related to the major streams of Humanities)
- 2) The learning outcomes must be clearly defined in the beginning of the file;
- 3) Try to integrate art(through cartoons, maps pictures, tables, concept maps etc.) to make the project interesting and engaging;

- 4) Correlate your project to the present situation as much as possible; Carryout newspaper references and pictures and articles/cartoons/pictures from as many newspapers and scholarly magazines as possible.
- 5) Clearly mention the innovative ideas, life skills and values you imbibe through the project in a paragraph towards the end;
- 6) The bibliography (all references which include both primary and secondary sources) must be clearly stated at the end;
- 7) Summarise the main themes in the form of short points on the last page;
- 8) 25-30 pages is the ideal length of the file.

GUIDELINES FOR SUBMITTING THE PROJECT

- Use A4 size sheets – preferably coloured
- It should be a hand written project
- You can use newspaper clippings, maps, diagrams and material from the web
- Each illustration should be supported with a write up/relevance to the topic
- The cover page should be written in bold letters with the topic, name and roll number

FOLLOW THE SEQUENCE OF PAGES AS GIVEN BELOW:

a) Cover Page

Title of Project

Name of submitter

School name

Year – 2024-25

b) Acknowledgement

c) Index/Content with page number

d) Introduction

e) Topic wise research with appropriate pictures

f) Newspaper Articles/ Cartoons/Current findings/Case Studies

g) Summary and Conclusion

h) Bibliography

i) **Reflection** – Your reflection / experience while doing this project. Also add your learning.

j) **Summary**

n) Leave a blank page at the end

RUBRICS:(FOR ASSESSMENT)

PRESENTATION	:5 MARKS
VALIDITY OF DATA/INFORMATION	:5 MARKS
RELEVANCE	:5 MARKS
VIVA	:5 MARKS

II) MAPWORK:Politics in India since independence:

A) On an outline political map of India, mark the location of the following princely states:

1)Junagadh; 2)Manipur; 3)Hyderabad; 4)Assam; 5) Jammu and Kashmir

B) On an outline political map of India locate and label the following:

- 1) State related to Potti Sriramulu
- 2) State carved out of Madhya Pradesh
- 3) State carved out of Punjab
- 4) State converted into two union territories recently.
- 5) States carved out of Assam.

MATHS

DO THE FOLLOWING QUESTIONS IN A SEPARATE REGISTER

Relations and Functions

- 1.Show that the function $f: R \rightarrow R$ defined by $f(x)= 3 - 4x$ is one – one and onto (Bijective).
- 2.Show that $f: N \rightarrow N$ defined by $f(x) = x^2 + x + 1$ is one – one but not onto.
- 3.Find fog and gof if $f, g: R \rightarrow R$ given by i) $f(x) = \text{Sin}x, g(x) = 4x^2$
ii) $f(x)=x^2, g(x) = 2x + 1$.
- 4.If $f: R \rightarrow R$ be a function defined by $f(x) = 10x + 7$, show that f is invertible. Find f^{-1} .
- 5.Show that $f: R \rightarrow R$ defined by i) $f(x)=(4x-3)/5, x \in R$ is one – one and onto function.
- 6.Show that the function $f: R \rightarrow R$ defined by $f(x) = 2x^3 - 7$ is a bijection.
- 7.Show that $f: R \rightarrow R$ defined by $f(x) = x^2$ is neither one – one nor onto.
- 8.Write the number of one – one functions from $\{a, b, c\}$ to itself.

9. If X and Y are two sets having 2 and 3 elements respectively, find the number of functions from X to Y.

Inverse Trigonometric Functions

1: Find the value of x for $\sin(x) = 2$.

2: Find $\sin(\cos^{-1} 3/5)$.

3. Solve: $\sin(\cot^{-1} x)$

4. Solve: $\sec^{-1}[\sec(-30^\circ)]$

5. If $\sin(\sin^{-1} 1/5 + \cos^{-1} x) = 1$, then what is the value of x?

6. Solve: $\tan(\sin^{-1} 12/13)$

7. Find the value of x, $\cos(\arccos 1) = \cos x$

8. Find the principal value of

(i) $\tan^{-1}(\tan 3\pi/4)$ (ii) $\cos^{-1}(\cos 2\pi/3) + \sin^{-1}(\sin 2\pi/3)$

9. Prove that:

(i) $\tan^{-1} 1/7 + \tan^{-1} 1/13 = \tan^{-1} 2/9$

(ii) $\tan^{-1} \sqrt{x} = 1/2 \cos^{-1}(1-x/1+x)$

(iii) $\tan^{-1} 1/2 + \tan^{-1} 1/5 + \tan^{-1} 1/8 = \pi/4$

(iv) $\cot^{-1}(\sqrt{1+\sin x} + \sqrt{1-\sin x}) / (\sqrt{1+\sin x} - \sqrt{1-\sin x}) = x/2, x \in (0, \pi/4)$

(iii) $\tan^{-1} 1/5 + \tan^{-1} 1/7 + \tan^{-1} 1/3 + \tan^{-1} 1/8 = \pi/4$

(iv) $\sin^{-1} 4/5 + \sin^{-1} 5/13 + \sin^{-1} 16/65 = \pi/2$

10. Show that : (a) $\tan^{-1} 1/2 + \tan^{-1} 2/11 = \tan^{-1} 3/4 = 1/2 \sin^{-1} 24/25$

(b) $\sin^{-1} 12/13 + \cos^{-1} 4/5 + \tan^{-1} 63/16 = \pi$

(c) $\cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18 = \cot^{-1} 3$

11. Solve for x:

(a) $\cos^{-1}(x^2 - 1/x^2 + 1) + \tan^{-1}(2x/x^2 - 1) = 2\pi/3$

(b) $\tan^{-1} 2x + \tan^{-1} 3x = \pi/4$

(c) $2 \tan^{-1}(\cos x) = \tan^{-1}(2 \operatorname{cosec} x)$

(d) $\tan^{-1} \left(\frac{1-x}{1+x} \right) = \frac{1}{2} \tan^{-1} x \quad (x > 0)$

(e) $\sin[\cot^{-1}(x + 1)] = \cos(\tan^{-1} x)$

MATRICES

1. If A is a square matrix such that $A^2 = A$, then $(I - A)^3 + A$ is equal to

- (a) I (b) 0 (c) I - A (d) I + A

2. If $A = [a_{ij}]$ is a square matrix of order 2 such that $a_{ij} = 1$, when $i \neq j$ and $a_{ij} = 0$, when $i = j$, then A^2 is

- (a) $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

3. Total number of possible matrices of order 3×3 with each entry 2 or 0 is

- (a) 9 (b) 27 (c) 81 (d) 512

4. If A and B are two matrices of the order $3 \times m$ and $3 \times n$, respectively, and $m = n$, then the order of matrix $(5A - 2B)$ is (a) $m \times 3$ (b) 3×3 (c) $m \times n$ (d) $3 \times n$

5. If

$$\begin{bmatrix} 2p + q & p - 2q \\ 5r - s & 4r + 3s \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}, \text{ then the value of } p + q - r + 2s \text{ is}$$

- (a) 8 (b) 10 (c) 4 (d) -8

6. The matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ is a

- (a) identity matrix (b) symmetric matrix
(c) skew symmetric matrix (d) none of these

7. For any two matrices A and B, we have

- (a) $AB = BA$ (b) $AB \neq BA$ (c) $AB = 0$ (d) None of the above.

8. If A and B are symmetric matrices of the same order, then $(AB' - BA')$ is a

- (a) Skew symmetric (b) Null matrix (c) Symmetric matrix (d) None of these.

9. If A is a skew-symmetric matrix, then A^2 is a

(a) Skew symmetric (b) Symmetric (c) Null (d) Cannot be determined.

10. If $A = \begin{bmatrix} 0 & 2 \\ 3 & -4 \end{bmatrix}$ and $kA = \begin{bmatrix} 0 & 3a \\ 2b & 24 \end{bmatrix}$, then the values of k, a and b respectively are

(a) -6, -12, -18 (b) -6, -4, -9 (c) -6, 4, 9 (d) -6, 12, 18.

11. Assertion: The determinant of a matrix $A = [a_{ij}]_{5 \times 5}$ where $a_{ij} + a_{ji} = 0$

for all i and j is zero

Reason: The determinant of a skew-symmetric matrix of odd order is zero.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

12. If $A = \begin{bmatrix} x+8 & 5 \\ 7 & x-7 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & x-7 \\ x-6 & 2 \end{bmatrix}$, Calculate: $A-B$.

13. Evaluate:

$$\begin{bmatrix} y-3 & 5 \\ y+3 & 5 \end{bmatrix}$$

14. If $5 \begin{bmatrix} a \\ b \end{bmatrix} = 14 \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$, find $a+b$.

15. Define matrix $M = \begin{bmatrix} 3 & 5 & 3 \\ -5 & 6 & -4 \\ 4 & 1 & -7 \end{bmatrix}$, and let I be the 3×3 identity matrix.

If $N = M - 6I$, then evaluate n_{31} .

16. Find the inverse of the matrix $A = \begin{bmatrix} 0 & -3/4 \\ 7/3 & 0 \end{bmatrix}$

17. $A = \begin{bmatrix} 7 & -4 \\ 4 & -3 \end{bmatrix}$ $B = \begin{bmatrix} 3/5 & 4/5 \\ -4/5 & -7/5 \end{bmatrix}$ Are A and B multiplicative inverse of

each other? (can we write that $A \cdot B = B \cdot A$)?

18. What value must x have, so that B is the inverse of A?

$$A = \begin{bmatrix} 1 & 3 \\ -1 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 2/5 & x \\ 1/5 & 1/5 \end{bmatrix}$$

19. What is the value of x , so the matrix A does not have an inverse?

$$A = \begin{bmatrix} 2 & 3 \\ x & -2 \end{bmatrix}$$

20. If A is a square matrix such that $A^2 = A$, show that $(1 + A)^3 = 7A + I$.

21. If $A = \begin{bmatrix} 3 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 3 \end{bmatrix}$, then find a non-zero matrix C such that $AC = BC$.

DETERMINANTS

1. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then the value of x is

- (a) 3 (b) ± 3 (c) ± 6 (d) 6

2. Value of k , for which $A = \begin{bmatrix} k & 8 \\ 4 & 2k \end{bmatrix}$ is a singular matrix is

- (a) 4 (b) -4 (c) ± 4 (d) 0.

3. If A is a square matrix of order 3 and $|A| = 5$, then the value of $|2A|$ is

- (a) -10 (b) 10 (c) -40 (d) 40.

4. The area of a triangle with vertices $(-3, 0)$, $(3, 0)$ and $(0, k)$ is 9 sq. units.

The value of k will be

- (a) 9 (b) 3 (c) -9 (d) 6.

5. Given that A is a square matrix of order 3 and $|A| = -4$, then $|\text{adj } A|$ is equal to

- (a) -4 (b) 4 (c) -16 (d) 16.

6. If $A = \begin{bmatrix} 2 & p & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{bmatrix}$, then A^{-1} exists if

- (a) $P = 2$ (b) $P \neq 2$ (c) $P \neq -2$ (d) None of these.

7. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, then find $14 A^{-1} - 1$.

8. Which of the following is correct?

- (a) Determinant is a square matrix.
- (b) Determinant is a number associated with a matrix.
- (c) Determinant is a number associated with a square matrix.
- (d) None of these.

9. If A is an invertible matrix of order 2, then $\det(A^{-1})$ is equal to

- (a) $\det(A)$ (b) $1/\det(A)$ (c) 1 (d) 0.

10. Calculate the determinant of matrix A .

$$A = \begin{bmatrix} 2 & 5 & 4 \\ 8 & 6 & 11 \\ 4 & 1 & 3 \end{bmatrix}$$

11. $A = \begin{bmatrix} 3 & 1 & 0 \\ 0 & a & 12 \\ 1 & 0 & a \end{bmatrix}$. A is a singular matrix for what values of a ?

12. Given: matrix C such that $\det C = 3/5$. Evaluate $\det C^T C$.

13. Consider the matrix

$$A = \begin{bmatrix} -1 & 2 & 0 \\ 3 & y & -2 \\ 2 & -5 & 2 \end{bmatrix}$$

where y is a real number. Evaluate y so that the minor M_{13} of this matrix is equal to 9.

14. S is a five-by-five matrix with determinant 100. Give the determinant of S^T

15. Given: a matrix K such that $\det K = \frac{3}{4}$. Give $\det(K^T)^{-1}$.

16. Find the maximum value of

$$\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 + \sin x & 1 \\ 1 & 1 & 1 + \cos x \end{vmatrix}$$

18. If $\begin{vmatrix} x & \sin x & \cos x \\ -\sin x & -x & 1 \\ \cos x & 1 & x \end{vmatrix} = 8$, write the value of x.

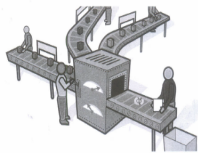
19. In the interval $\pi/2 < x < \pi$, find the value of x for which the matrix $\begin{bmatrix} 2\sin x & 3 \\ 1 & 2\sin x \end{bmatrix}$ is singular.

20. Write the value of the determinant $\begin{vmatrix} p & p+1 \\ -p-1 & p \end{vmatrix}$

21. Evaluate :

$$\Delta = \begin{vmatrix} 0 & \sin x & -\cos x \\ -\sin x & 0 & \sin y \\ \cos x & -\sin y & 0 \end{vmatrix}$$

22. A company produces three products every day. Their production on a certain day is 45 tons. It is found that the production of the third product exceeds the production of the first product by 8 tons while the total production of the first and third product is twice the production of the second product.



Using the concepts of matrices and determinants, answer the following questions.

(i) If x, y and z respectively denote the quantity (in tons) of first, second and third product produced, then which of the following is true?

- (a) $x + y + z = 45$ (b) $x + 8 = z$ (c) $-2y + z = 0$ (d) all of these

(ii) If inverse of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & -2 \\ 1 & -1 & 1 \end{bmatrix} = \frac{1}{6} \begin{bmatrix} 2 & 2 & 2 \\ 3 & 0 & -3 \\ 1 & -2 & 1 \end{bmatrix}$,

Then inverse of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & -1 \\ 1 & -2 & 1 \end{bmatrix}$ is

(a) $\begin{bmatrix} 1/2 & 1/3 & 1/3 \\ 1/2 & 0 & -1/2 \\ 1/6 & -1/3 & 1/6 \end{bmatrix}$ (b) $\begin{bmatrix} 1/2 & 0 & -1/2 \\ 1/3 & 1/3 & 1/3 \\ 1/6 & -1/3 & 1/6 \end{bmatrix}$

(c) $\begin{bmatrix} 1/3 & 1/2 & -1/2 \\ 1/3 & 0 & -1/3 \\ 1/3 & -1/2 & 1/6 \end{bmatrix}$ (d) none of these.

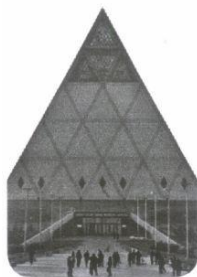
(iii) $x : y : z$ is equal to

- (a) 12: 13: 20 (b) 11:15:19 (c) 15: 19: 11 (d) 13:12:20

(iv) Which of the following is not true?

- (a) $|A| = |A'|$ (b) $(A' \cdot I) = (A \cdot I)$ (c) if A is a skew-symmetric matrix of odd order then $|A|=0$
 (d) $|AB|=|A| + |B|$

23 .Each triangular face of the Pyramid of Peace in Kazakhstan is made up of 25 smaller equilateral triangles as shown in the figure.



Using the above information and concept of determinants, answer the following questions

- (i) If the vertices of one of the smaller equilateral triangle are $(0, 0)$, $(3, \sqrt{3})$ and $(3, -\sqrt{3})$ then the area of such triangle is

(a) 2 units

(b) 3 units

(c) $\sqrt{3}$ units

(d)
4
unit
s

(iv) If (2, 4), (2, 6) are two vertices of a smaller equilateral triangle, then the third vertex will lie on the line represented by:

(a) $x+y=5$ (b) $x=1+\sqrt{3}$ (c) $x=2+\sqrt{3}$ (d) $2x+y=5$.

(v) Let A(a, 0), B(0, b) and C(1, 1) be three points. If $\frac{1}{a} + \frac{1}{b} = 1$ then the three points are

(a) vertices of an equilateral triangle (b) vertices of a right angled triangle (c) collinear (d) vertices of an isosceles triangle

24. Two schools A and B want to award their selected students on the values of Honesty, Hard work and Punctuality. The school A wants to award Rs.x each, Rs.y each and Rs.z each for the three respective values to its 3, 2 and 1 students respectively with a total award money of Rs.2200. School B wants to spend Rs.3100 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as school A). The total amount of award for one prize on each value is Rs.1200.



Using the concept of matrices and determinants, answer the following questions.

(i) What is the award money for Honesty?

(a) Rs.350 (b) Rs.300 (c) Rs.500 (d) Rs.400

(ii) What is the award money for Punctuality?

(a) Rs.300 (b) Rs.280 (c) Rs.450 (d) Rs.500

(iii) What is the award money for Hard work?

(a) Rs 500 (b) Rs.400 (c) (d) none of these

(iv) If a matrix P is both symmetric and skew-symmetric, then $|P|$ is equal to

(a) 1 (b) -1 (c) 0 (d) none of these

(v) If P and Q are two matrices such that $PQ = Q$ and $QP = P$, then $|Q^2|$ is equal to

- (a) |QI (b) |PI (c) 1 1(d) 0

25. Area of a triangle whose vertices are $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3) is given by the determinant

$$\frac{1}{6} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

Since, area is a positive quantity, we always take the absolute value of the determinant Δ . Also, the area of the triangle formed by three collinear points is zero. Based on the above information, answer the following questions

(i) Find the area of the triangle whose vertices are $(-2, 6), (3, -6)$ and $(1, 5)$.

- (a) 30 sq. units (b) 35 sq. units (c) 40 sq. units (d) 15.5 sq. units

(ii) If the points $(2, -3), (k, -1)$ and $(0, 4)$ are collinear, then find the value of $4k$

- (a) 4 (b) $7/140$ (c) 4 (d) $40/7$

iii) If the area of a triangle ABC, with vertices $A(1, 3), B(0, 0)$ and $C(k, 0)$ is 3 sq. units, then a value of k is

- (a) 2 (b) 3 (c) 4 (d) 5

(iv) Using determinants, find the equation of the line joining the points $A(1, 2)$ and $B(3, 6)$.

- (a) $y=2x$ (b) $x=3y$ (c) $y=x$ (d) $4x-y=5$

(v) If $A=(11,7), B=(5,5)$ and $C=(-1,3)$, then

- (a) ΔABC is scalene triangle (b) ΔABC is equilateral triangle
(c) A, B and C are collinear (d) None of these

26. Gaurav purchased 5 pens, 3 bags and 1 instrument box and paid Rs. 16. From the same shop, Dheeraj purchased 2 pens, 1 bag and 3 instrument boxes and paid Rs. 19, while Ankur purchased 1 pen, 2 bags and 4 instrument boxes and paid Rs. 25.



Using the concept of matrices and determinants, answer the following questions.

(i) The cost of one pen is

- (a) Rs. 2 (b) Rs. 5 (c) Rs. 1 (d) Rs. 3

(ii) What is the cost of one pen and one bag?

- (a) Rs. 3 (b) Rs. 5 (c) Rs. 7 (d) Rs. 8

(iii) What is the cost of one pen and one instrument box?

- (a) Rs. 7 (b) Rs. 6 (c) Rs. 8 (d) Rs. 9

(iv) Which of the following is correct?

- (a) Determinant is a square matrix. (b) Determinant is a number associated to a matrix
 (c) Determinant is a number associated to a square matrix (d) All of the above

(v) From the matrix equation $AB = AC$, it can be concluded that $B = C$ provided

- (a) A is singular (b) A is non-singular (c) A is symmetric (d) A is square

MUSIC – HINDUSTANI (VOCAL)

1. Learn short notes: Meend, Murki, Shruti, Dhwani and Alankar.
2. Brief account of the musical life of :
Ustad Bade Ghulam Ali Khan and Pt. Krishna Rao Shankar Ji.
3. Thekas of the following Talas with dugun laykari:
Dhamar, Jhaptaal, and Rupak.
4. Practice one Tarana, one Sufi Song and one filmi/Non-filmi Bhajan.

COMPUTER SCIENCE

- Q1
- a Write the command to show names of all databases present in MySQL RDBMS.
 - b Explain Primary Key constraint and write the command to add Primary Key constraint on empno column of employee table.
 - c There is a column department in a table OFFICE. The following two statements are giving different outputs. Write the possible reason.
Select count(*) from office;
Select count(department) from office;
 - d A table "BOOKS" in a database has 5 columns and contains 100 records. What is the degree and cardinality of this table?

- Q2
- a What is the use of delete command in SQL? How is it different from the drop command?
 - b Consider the table WaterBill as given below. Write commands in SQL for (1) to (5) and output for (6) to (7)

WaterBill

MNo	Consumer Name	Consumption	Bill amount
1001	Arti Goel	20	3000
1002	Rohan Kumar	30	4500
1003	Reena	25	4000
1004	Divya Sharma	40	6000

- (1) Display the consumer name and consumption of all consumers whose bill amount is above 4000.
- (2) Display the records of all consumers whose names start with a letter 'R'.
- (3) Display total number of consumers.
- (4) Display the record of all consumers in descending order of bill_amount.
- (5) Display the records of all consumers whose consumption is between 20 to 30.
- (6) Select Max(bill_amount) from waterbill;
- (7) Select * from waterbill where mno in(1002, 1004);

- Q3
- a Write an SQL query to create the table 'State' with the following structure:

Field	Type	Constraint
S_Id	Varchar(5)	Primary Key
S_Name	Varchar(20)	Not Null
S_Population	integer(4)	
S_SeniorCitizen	integer(4)	

- b Consider the following tables PERSONAL and JOB. Write SQL commands for the statements (1) to (5) and give outputs for (6):

PERSONAL

Empno	Name	DateofBirth	Native place	Hobby
123	Amit	23-Jan-1965	Delhi	Music

127	Manoj	12-Dec-1976	Mumbai	Writing
124	Abhai	11-Aug-1975	Allahabad	Music
125	Vinod	04-Apr-1977	Delhi	Sports
128	Abhay	10-Mar-1974	Mumbai	Gardening
129	Ramesh	28-Oct-1981	Pune	Sports

JOB

Eno	Area	App date	Salary	Retd date	Dept
123	Agra	25-Jan-2006	5000	25-Jan-2026	Marketing
127	Mathura	22-Dec-2006	6000	22-Dec-2026	Finance
124	Agra	19-Aug-2007	5500	19-Aug-2027	Marketing
125	Delhi	14-Apr-2004	8500	14-Apr-2018	Sales
128	Pune	13-Mar-2008	7500	13-Mar-2028	Sales

1. Show empno, name and Native_Place of those who have Sports as hobby.
2. Show total number of employee.
3. Show empno, name, hobby in descending order of empno.
4. Show the empno, appointment date and area of those whose dept do not start with alphabet 'S'.
5. Increase salary of the employees by 5 % of their present salary whose area is "Mathura".
6. Write the output of:
 - (i). Select avg(salary) from job where area in('Agra','Delhi');
 - (ii). Select count(distinct Native_place) from personal.

Q4. Write a program using a user defined function that displays sum of first n natural numbers, where n is passed as an argument.

Q5. Write a program using a user defined function myMean() to calculate the mean of floating values stored in a list.

Q6. Write a program using a user defined function calcFact() to calculate and display the factorial of a number num passed as an argument.

Q7. Write a program using user defined function that accepts length and breadth of a rectangle and returns the area and perimeter of the rectangle.

Q8. Write a program to check the divisibility of a number by 7 that is passed as a parameter to the user defined function.

Q9. Write a program with the help of function DecimalToBinary(a) which converts a decimal number to binary number. Binary number can be stored in a list.

Q10. Write a program that creates a GK quiz consisting of any five questions of your choice. The questions should be displayed randomly. Create a user defined function score() to calculate the score of the quiz.

PHYSICAL EDUCATION

Prepare a record file, practical no 1 to 3 on Physical Education lab manual (Please see in Physical Education lab Manual).

Practical -1 Fitness tests administration for all items

Practical -2 : Procedure for Asanas, Benefits & Contraindications for each lifestyle disease.

Practical -3 :Any one game of your choice out of the list above. Labelled diagram of field & Equipment (Rules, Terminologies & Skills) Anyone IOA recognised Sports/game choice, Labelled diagram of field and equipment. Also mentions rules terminologies and skills.