

SAMPLE PAPER
HALF YEARLY EXAMS 2026
CLASS IX -A
GEOGRAPHY

M.M. 80.

TIME: 2 HOURS

NOTE: THIS QUESTION PAPER IS DIVIDED INTO TWO SECTIONS . SECTION A IS COMPULSORY. YOU MAY ATTEMPT ANY FIVE QUESTIONS FROM SECTION B.

SECTION – A (30 MARKS)

Q1. Answer the following questions briefly: (10×1=10)

- A) What is the main temperature of the earth? What will happen if this temperature changes?
- B) What do you understand by the abbreviation- GMT? What is its importance?
- C) What is the relationship of the seasons of Northern and Southern hemisphere?
- D) Why is the core of the earth in a solid state?
- E) Name the two scales that measure the intensity and observed effects of an earthquake respectively.
- F) Name the two types of volcanic landforms. Give one example of each.
- G) State one difference between physical and chemical weathering.
- H) Which are the first seismic waves to reach the earth and why?
- I) Give reason why Sedimentary rocks are called stratified rocks.
- J) Name the two types of ocean currents based on temperature. Give one example of each.

Q2. On the given world map mark the following using suitable colours. Write the name directly along with the question numbers.

- A) Southern ocean
- B) Strait of Malacca
- C) River Colorado
- D) Mediterranean sea
- E) River Paraguay
- F) Hudson Bay
- G) River Niger
- H) Gulf of Mexico
- I) North sea
- J) River Hwang ho

Q3. Choose the correct option: (10×1=10)

A) The narrow realm of contact and interaction between atmosphere hydrosphere and lithosphere where life exists:

- i) Nutrition cycle
- ii) Oxygen cycle
- iii) Biosphere
- iv) All of these

B) Assertion (A) : igneous rocks are formed by the cooling and consolidation of the molten material.

Reason (R) : igneous rocks are called primary rocks.

- i) Both A and R are true and R is the correct explanation of A.
- ii) Both A and R are true but R is not the correct explanation of A.
- iii) A is true but R is false.
- iv) A is false but R is true.

C) All the places on earth experience seasonal variations these variations are the result of:

- i) Rotation of earth
- ii) Revolution of Earth
- iii) Rotation of earth on an inclined axis
- iv) Revolution of Earth on an inclined axis.

D) Match the column and choose the correct option.

1.Coal	a)Old fold mountains
2. Marble	b)Sedimentary rocks
3.Tibet	c) Metamorphic rocks
4. Ural	d) Highest plateau

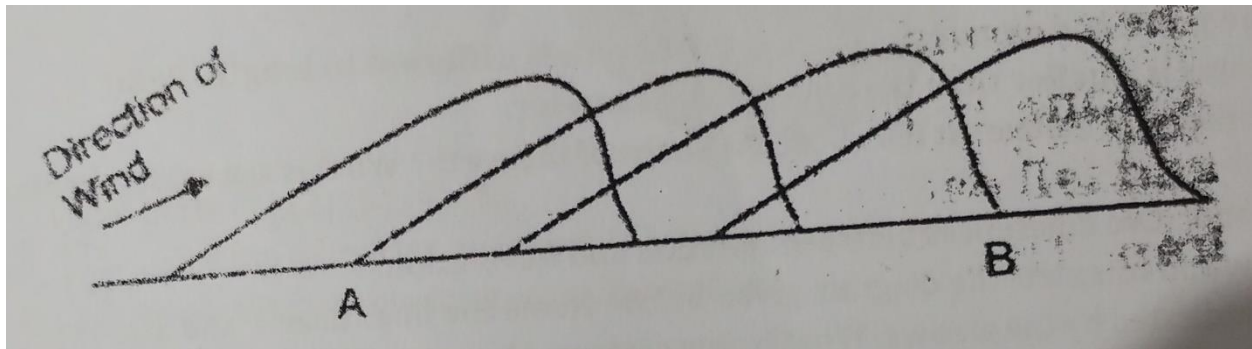
Options:

- i) 1(a) 2(b). 3(c) 4(d)
- ii) 1(b). 2(c) . 3(d) 4(a)
- iii) 1(d) 2(a) 3 (b) 4(c)
- iv) 1(b) 2(d) 3(c) 4(a)

E) Which of the following is not a process of chemical weathering:

- i) Exfoliation
- ii) Carbonation

- iii) Oxidation
 - iv) Solution
- F) On the 21st of March what will be the length of day at 45 degree north if it is 12 hours at the equator:
- i) 15 hours
 - ii) 14 hours
 - iii) 12 hours
 - iv) 13 hours
- G) Identify the feature shown below:



- i) Fold mountains
 - ii) Sea waves
 - iii) Migrating sand dunes
 - iv) Tides
- H) Which among the following is not a warm ocean current:
- i) Gulf stream
 - ii) Oyashio
 - iii) Kuroshio
 - iv) North Atlantic Drift
- I) Assertion (A): weathering is a dynamic process.
Reason (R): it occurs at or near the surface of the earth.
- i) Both A and R are true and R is the correct explanation of A.
 - ii) Both A and R are true but R is not the correct explanation of A.
 - iii) A is true and R is false.
 - iv) A is false but R is true.
- J) Which of the following landforms is formed in the upper course of the river:
- i) V shaped valleys and waterfalls
 - ii) Meanders and oxbow lakes
 - iii) Delta and estuary
 - iv) Seifs and Barchans

SECTION B (50 MARKS)

Attempt any five questions from this section it is compulsory to attempt all the subsection of the chosen question. The sequence of the questions should be strictly followed:

Q4.a) Describe briefly the shape of the earth. Why is it so? (2)

b) Explain the Bedford Level Experiment with the help of a diagram.(2)

c) Give reasons for the following statements: (3)

i)Venus is the hottest planet of the solar system

ii)Our Earth is a unique planet

iii) Lunar eclipse proves that earth is a sphere.

d) Draw a well labelled diagram to show how water is continuously available on earth.(3)

Q5.a) Define the terms: (2)

i)Dusk

i) International Date Line.

b) Calculate the time of 25° East longitude if the time at 65°West is 12 noon.(2)

c) Give reasons for the following statements (3)

i)Parallels of Latitude decrease in size from the equator towards the poles.

ii)Diametrically opposite longitudes and the equator are called Great Circles

iii)All the places in India record the same time.

d) Give a geographical term (One word) for each of the following statements: (3)

i) The heat zone that lies between the tropic of Cancer and the tropic of Capricorn.

- ii) The longitude used to determine World Standard Time.
- iii) A framework of lines of longitudes and latitudes on a globe or a map.

Q6. a) Differentiate between rotation and revolution.

b) Explain the term Equinox. Mention the dates of Spring and Autumn Equinox. (2)

c) Give reasons for the following statements.: (3)

- i) Every fourth year is a leap year.
- ii) In Australia, Christmas is celebrated during summer.
- iii) Norway is called the land of midnight sun.
- d) Draw a neat and well labelled diagram to show the nearest and the farthest distance of Earth from the Sun while revolution. (3)

.Q7.a) Mention two differences between the young and old fold mountains. (2)

b) Explain the following: (2)

i) Khadar & Bhangar soils.

ii) Residual mountains

c) Describe the different concentric layers of the earth's interior on the basis of location, thickness and composition. (3)

d) Draw a well labelled diagram to show the formation of fold mountains.

OR

Residual mountains (3)

Q8.a) Give one point of difference between. (2)

i) Extrusive and Intrusive igneous rocks.

ii) Thermal and Dynamic metamorphism.

b) 'Rocks are of great economic significance.' Explain. (2)

c) Give a geographical term for the following statements: (3)

i) This cyclic process keeps the earth young.

ii) The Rock that contains fossils.

iii) The process that turns loose sediments into hard Rocks.

d) With reference to sedimentary rocks explain the term lithification. Also name the different types of sedimentary rocks on the basis of agents of formation. (3)

Q9.a) Define Volcanoes. Name the products of a volcano. (2)

b) State two constructive effects of an earthquake.

c) With reference to earthquake, explain the following terms.:

i) Seismic Focus and Epicenter

ii) Tsunami

iii) Seismogram

d) Draw a well labelled diagram to show the structure of a volcano.

Q10.a) Explain biological weathering. Name the agents involved. (2)

b) Draw a neat and well labelled diagram to show the Waterfall . OR an Oxbow lake along with meandering river. (2)

c) Give a technical term for the following (3)

i) Disintegration or decomposition of rocks

ii) Peeling-off of the outer layer of rocks through contraction and expansion.

iii) Reaction of minerals in rocks due to the atmospheric oxygen.

d) Give reasons for the following:

i) The work of wind is more prominent in the desert

ii) Migrating sand dunes are dangerous.

iii) All rivers do not form a delta.

Q11.a) State two differences between spring and neap tides. (2)

b) What are ocean currents? List two important causes of ocean currents.(2)

c) Give reasons for the following statements(3)

i)Each day a tide is delayed by 26 minutes.

ii)The coasts of Norway are not frozen even during winters.

iii)There is heavy rainfall in Queensland in Australia but the Atacama desert in the same latitude, remains dry.

d) Draw a diagram to show Spring tides.(3)

Or

Apogee and Perigee

MATHEMATICS - Sample Question Paper

Class: IX (ICSE Board Pattern) Maximum Marks: 80 Time Allowed: 2.5 Hours

General Instructions:

This paper is divided into two sections: Section A and Section B.

Section A (40 Marks) is compulsory. Attempt all questions from this section.

Section B (40 Marks) contains 7 questions. You are required to attempt any four questions from this section.

All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

Omission of essential working will result in loss of marks.

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question 1 Choose the correct answers to the questions from the given options. [15 × 1 = 15]

(i) The rationalizing factor of is:

(ii) The compound interest on Rs. per annum for year, compounded half-yearly is:

Rs.

Rs.

Rs.

Rs.

(iii) If , then the value of (where) is:

(iv) The factors of are:

(v) The simplified value of is:

(vi) If , then the value of is:

(a)

(vii) If , then the value of is:

(viii) The value of is:

(ix) The distance between the points is:

(d)

(x) In what ratio does the x-axis divide the line segment joining the points and
?

(xi) If , the value of is:

(xii) What sum of money will amount to Rs. years at per annum compound interest?

Rs.

Rs.

Rs.

Rs.

(xiii) The expansion of $(a+b)^n$ is:

(xiv) If $\frac{a}{b} = \frac{c}{d}$, the value of $\frac{a+d}{b+d}$ is:

(xv) The midpoint of the line segment joining (a, b) and (c, d) . The values of a and b are:

Question 2

A sum of money amounts to Rs. x years and Rs. y years at compound interest. Find the rate of interest and the principal sum. [4]

If $\frac{a}{b} = \frac{c}{d}$, find the value of $\frac{a+d}{b+d}$. [4]

Find the coordinates of the point which divides the line segment joining the points (a, b) and (c, d) internally in the ratio $m:n$. [4]

Question 3

Solve for x . [4]

Find the values of θ . [4]

Prove the following trigonometric identity:

[5]

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question 4

Solve the system of exponential equations for x and y :

[3]

The coordinates of the vertices of a triangle are $A(1, 2)$, $B(4, 6)$ and $C(7, 2)$.

Find the length of the median drawn from the vertex A .

The difference between the simple interest and compound interest on a certain sum of money for 2 years at 10% per annum is Rs. 100. Find the sum. [4]

Question 5

Factorize completely: $x^3 - 2x^2 - 15x + 18$. [3]

If $\log_2 8 = 3$, find $\log_2 16$. [3]

Evaluate using properties of logarithms:

[4]

Question 6

Simplify by rationalizing the denominators:

[3]

If $\sin \theta = \frac{3}{5}$, find the value of $\cos \theta$. [3]

Evaluate without using trigonometric tables:

[4]

Question 7

The value of a machine depreciates every year by 10%. If its present value is Rs. 1,00,000, what was its value 3 years ago? [3]

Simplify: $\frac{1}{\sin \theta} + \frac{\cos \theta}{\sin \theta}$. [3]

Show that the points $A(1, 2)$, $B(4, 6)$, $C(7, 2)$ and $D(4, -2)$ form a rhombus. [4]

Question 8

Prove that: . [3]

If , prove that . [3]

If . [4]

Question 9

Find the values of and if the point lies on the line segment joining the points

and . Also, find the ratio in which the point divides . [3]

In a right-angled triangle , right-angled at , find the value of

. [3]

(c) A man borrows Rs. per annum compound interest. He repays Rs.

at the end of each year. Calculate the amount he must pay at the end of the third year to clear his debt. [4]

Question 10

Expand using a suitable identity: . [3]

Solve for . [3]

Solve the logarithmic equation: . [4]

SILVER GROVE SCHOOL

HALF-YEARLY EXAMINATION

CLASS – IX-A | CHEMISTRY

TIME: 2 Hrs.

M.M.: 80

General Instructions

1. Attempt all questions from Section I and any four questions from Section II.
2. The marks of questions are given in brackets.

SECTION I

(40 Marks)

Attempt all questions from this Section.

Question 1

Choose the correct option. ($10 \times 1 = 10$ marks)

(i) According to Rutherford's atomic model, the positively charged part of an atom is concentrated in the:

- (a) Electron cloud
- (b) Nucleus
- (c) Valence shell
- (d) Orbit

(ii) Atoms of the same element having different mass numbers are called:

- (a) Isobars
- (b) Isotones

(c) Isotopes

(d) Ions

(iii) Which of the following particles has no charge?

(a) Proton

(b) Electron

(c) Neutron

(d) Positron

(iv) The maximum number of electrons that can be accommodated in the K-shell is:

(a) 1

(b) 2

(c) 8

(d) 18

(v) Temporary hardness of water can be removed by:

(a) Filtration

(b) Boiling

(c) Decantation

(d) Sublimation

(vi) A bond formed by transfer of electrons is called:

(a) Covalent bond

- (b) Ionic bond
- (c) Metallic bond
- (d) Coordinate bond

(vii) Which of the following is a covalent compound?

- (a) NaCl
- (b) MgO
- (c) CH₄
- (d) CaCl₂

(viii) The electrons present in the outermost shell are called:

- (a) Free electrons
- (b) Valence electrons
- (c) Core electrons
- (d) Paired electrons

(ix) A reaction in which heat is absorbed is called:

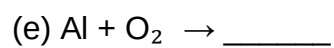
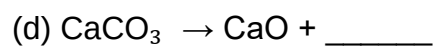
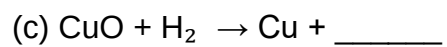
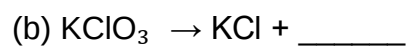
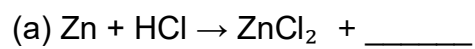
- (a) Exothermic reaction
- (b) Endothermic reaction
- (c) Neutralisation reaction
- (d) Displacement reaction

(x) How many pairs of electrons are shared in a double covalent bond?

- (a) One
- (b) Two
- (c) Three
- (d) Four

Question 2

Complete and balance the following equations. (5 marks)



Question 3

Fill in the blanks. (5 marks)

- (i) The central part of an atom is called the _____.
- (ii) Isotopes have the same _____ number but different _____ numbers.
- (iii) The number of protons present in the nucleus is called the _____ number.
- (iv) A reaction in which heat is released is called an _____ reaction.
- (v) Water containing dissolved salts of calcium and magnesium is called _____ water.

Question 4

Write balanced chemical equations for the following reactions. (5 marks)

- (i) Sodium with water.
- (ii) Calcium with water.
- (iii) Iron with steam.
- (iv) Magnesium with dilute hydrochloric acid.
- (v) Zinc with dilute sulphuric acid.

Question 5

Answer the following: (5 marks)

(i) Why do ionic compounds conduct electricity in molten state?

(ii) Write the electron-dot structures of:

(a) H_2

(b) Cl_2

Question 6

Calculate the percentage composition of water of crystallisation in washing soda

$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$. (5 marks)

Atomic weights: Na = 23, C = 12, O = 16, H = 1.

Question 7

Name the following. (5 marks)

- (i) Two metals which react vigorously with cold water.
- (ii) A metal which reacts with steam to form a magnetic oxide.
- (iii) A metal which does not react with water.
- (iv) The gas which supports combustion.
- (v) The gas used by green plants during photosynthesis.

SECTION II

(40 Marks)

Attempt any four questions from this Section.

Question 8

Give reasons for the following: (5 marks)

- (i) Water is called a universal solvent.
- (ii) Ionic compounds have high melting and boiling points.

(iii) Chemical reactions are accompanied by energy changes.

(iv) Rivers and lakes do not freeze completely during winter.

(v) Covalent compounds generally have low melting points.

Question 9

Differentiate between the following: (5 marks)

(i) Hard water and soft water.

(ii) Ionic bond and covalent bond.

Question 10

A solution contains 50 g of common salt dissolved in 450 g of water. Calculate the concentration of the solution in terms of mass by mass percentage. (5 marks)

Question 11

(a) Give one example of each: (3 marks)

(i) Anhydrous substance.

(ii) Efflorescent substance.

(iii) Deliquescent substance.

(b) State Henry's law for the solubility of a gas in a liquid. (2 marks)

Question 12

Answer the following: (5 marks)

(i) Why does the boiling point of water decrease at high altitudes?

(ii) Why is a pressure cooker useful in mountainous regions?

Question 13

(a) What were the main observations of Rutherford's alpha-particle scattering experiment? (3 marks)

(b) State any two limitations of Rutherford's atomic model. (2 marks)

Question 14

(a) Why are dissolved salts important in drinking water? (2 marks)

(b) Define the following: (3 marks)

(i) Solubility

(ii) Solution

(iii) Solute

Question 15

(a) Differentiate between ionic compounds and covalent compounds. (3 marks)

(b) Calculate the percentage composition of each element present in H_2SO_4 . (2 marks)

Atomic weights: H = 1, S = 32, O = 16.

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Sample Paper

Class 9 A

Subject Commercial Applications

MM 100

Time allowed: Two hours

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Attempt all questions from Section A and any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets[].

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1 [20]

1. Which of the following correctly distinguishes between commerce and trade?

- (a) Commerce involves production, while trade deals with distribution
- (b) Commerce involves distribution and auxiliary services, while trade focuses on buying and selling goods.
- (c) Trade creates time utility, while commerce creates form utility.
- (d) Commerce is a subset of trade.

2. An organisation is funded entirely by private individuals and operates solely for earning profits, it would be classified under public sector enterprises

- (a) True

(b) False

3.. In a joint Hindu family business, the karta passes away unexpectedly. However, the business operations continue without interruption as the eldest son takes over the role of karta. Which feature of joint Hindu family business does this demonstrate?

(a) Perpetual succession

(b) Hasty decisions

(c) Limited liability

(d) Ease of formation

4.Statement 1: All the male members of a Joint Hindu family business are known as coparceners.

Statement II: The oldest member is known as Karta.

(a) Only I is correct

(b) Both I and II are correct

(c) Only II is correct

(d) Both I and II are wrong

5. The disadvantages suffered by Joint Hindu Family business are:

- (a) Hasty Decisions
- (b) Unlimited Liability
- (c) Limited Capital
- (d) All of these

6. Statement I: Expenses of management are high in Joint Hindu Family Business.

Statement II: The Karta alone is authorised to take all important decisions of the family business.

- (a) Both I and II are correct
- (b) Only I is correct
- (c) Both I and II are wrong
- (d) Only II is correct

7. How profit is distributed in Joint Hindu Family Business?

- (a) Men have more share than women

(b) The older members of family receives more profit than younger members

(c) Equal shares for all of them

(d) Only the Karta has all the profit

8.. Which of the following statement is incorrect?

(a) Each partner is liable to an unlimited extent for the firm's obligations towards outsiders.

(b) A partnership can be formed only for the purpose of carrying on a business.

(c) Each partner is liable for acts performed by other partners on behalf of the firm.

(d) An association of persons who jointly own a house without carrying on a business can be considered as partnership.

9. A company faces criticism for taking too long to make decisions due to bureaucratic delays. Which disadvantage of joint stock companies is highlighted here?

(a) Lack of motivation

(b) Delay in decision-making

(c) Unhealthy speculation

(d) Conflict of interests

10. A shareholder in a public company transfers all their shares to a competitor, leading to significant changes in company control. The board of directors raises concerns about the implications. What feature of public companies allows such an event to occur?

(a) Transferability of shares

(b) Limited liability

(c) Perpetual succession

(d) Common seal

11. Name the association of artisans and small producers which helps to improve the bargaining power and competitive position of its members -

(a) Consumer cooperatives

(b) Bargaining cooperatives

(c) Marketing cooperatives

(d) None of these

12. The principle of 'One Man, One Vote' in cooperative societies means that voting rights are proportional to the amount of capital a member contributes.

(a) True

(b) False

13. Assertion (A): Cooperative societies aim to provide service to their members rather than earning profits.

Reasoning (R): Members of cooperative societies earn dividends in proportion to their capital investment.

(a) Both A and R are true, and R explains A.

(b) Both A and R are true, but R does not explain A.

(c) A is true, but R is false.

(d) A is false, but R is true.

14. Public sector enterprises have been set up in India to achieve several objectives. Which of them is not correct-

(a) Substantial increase in industrial output

(b) To balance in the development of various sector of economy

(c) To provide opportunities for gainful employment to millions of people in rural area

(d) To curb private monopoly

15. Public enterprises frequently face labour trouble because

Statement 1: Workers of enterprises are permanent and can not be removed.

Statement II: Politicians use trade union for their selfish interest.

(a) Statement I is correct

(b) Statement II is correct

(c) State I & II are correct

(d) Neither statement I nor II is correct

16. Which of the following cannot be the form of Public Sector Enterprises?

(a) Departmental Undertaking

(b) Statutory Corporation

(c) Private Corporation

(d) Government Companies

17. Which of the following enterprises does not belong to departmental undertaking?

(a) Indian Railways

(b) Post and Telegraph

(c) Air India

(d) All India Radio

18. If the government wants to maintain secrecy in a national defence project, which form of public enterprise should it choose?

(a) Government Company

(b) Departmental Undertaking

(c) Public Corporation

(d) Private Company

19. Public sector organizations may either be partly or wholly owned by the government.

(a) State

(b) Central

(c) Foreign

(d) Central or State

20. An organisation is working for the purpose of public welfare as a ministry of government and all its income is deposited in the government treasury. Identify which kind of public sector enterprise it.

(a) Partnership

(c) Sole proprietorship

(b) Department undertaking

(d) Company

Question 2(10)

I.Distinguish between

a.Primary Sector and Secondary Sector

b.Public Sector and Private Sector

ii.Justify the following sentences for or against and give a reason:

a.Trade is the nucleus of Commerce.

b.A temple is a non - commercial organisation.

c. Communication is more important in a commercial organisation than in a non commercial organisation.

Question 3 Answer the following questions(10)

I .What do you mean by a joint stock company ?

II. What is the implied agency in partnership?

III. Name and give examples of any two types of primary industries.

IV. How does the principle of one member one vote in cooperative societies promote democratic decision making?

V. List any two functions of production department.

Section B(15×4=60)

(Answer any four questions from this section.)

4.1. Partnership firms dealing in handmade products are struggling due to limited funds and lack of access to large markets. The partners are considered to be converting the firm into an LLP .What advantages would LLP offer in this scenario?

2. Both verbal and nonverbal communications are essential for effective communication. Evaluate.

3. Discuss the functions of the human resource department in a large business firm.

5.1 Discuss the functions of the production department in a large business firm.

2. Cooperative societies may face challenges in raising external capital from non members .Explain with the help of an example.

3. Identify the type of industry given in the picture and explain its features.

6.1. Name and explain how Human Resource Management helps to improve the quality of work life of its employees.

2. How joint Hindu family overcome the shortcomings of sole proprietorship?

3. When a company is not required to insert word 'Public limited' or 'Private limited 'after its name?

7.1. Discuss the merits and demerits of a government company.

2.What advantages does a joint stock company enjoy over other forms of business organisation?

3. Members of cooperative societies pool their land and use modern agriculture techniques to increase productivity. What is this cooperative society called? How does it help in improving yield and reducing costs?

8.1. What is the role of finance department in commercial organisation?

2. Explain the functions of general administration and legal department in a commercial organisation.

3. Evaluate the challenges faced by cooperative societies in maintaining financial sustainability and operational efficiency.

Question 9.

(Analysis)

Case Study

Indian Railways, one of the largest public sector enterprises in the world, serves as a vital lifeline for India's economy. It has evolved into one of the most extensive and busiest rail networks globally, transporting millions of passengers and tonnes of freight daily. Established in 1853, it operates as a government-owned entity under the Ministry of Railways. Over the decades, this vast enterprise has faced numerous challenges.

One of the significant issues has been infrastructure overload. With rapid population growth, the demand for rail services has often outpaced the expansion of the network, leading to congestion on critical routes. Financial strain has also been a persistent problem, as maintaining affordable fares for the masses has limited the enterprise's revenue generation capacity. Moreover, safety concerns due to aging infrastructure and outdated signaling systems have caused frequent accidents. Adding to these, diesel-powered locomotives have contributed to environmental pollution, prompting the need for cleaner energy solutions.

To address these challenges, Indian Railways has implemented several reforms. A major initiative has been the electrification of the railway network, reducing reliance on diesel and cutting greenhouse gas emissions. More than 70% of the network is now electrified, with the goal of full electrification in the near future. Alongside this, Indian Railways has embraced digital transformation by introducing online ticketing systems and mobile apps, streamlining the booking process and improving customer convenience. Safety measures, including advanced signaling systems and regular maintenance schedules, have been adopted to ensure safer operations. Additionally, the enterprise has invited private players through Public-Private Partnerships (PPPs) to modernize stations and operate luxury trains, boosting revenue and enhancing service quality.

These reforms have had a profound impact on the nation. Economically, Indian Railways has been a crucial driver of growth, connecting remote areas with urban centers and facilitating trade and commerce. Environmentally, electrification has significantly reduced emissions, aligning with India's commitment to sustainable development. Socially, it remains one of the largest employers in the country, providing

livelihoods to millions of people. Furthermore, the introduction of high-speed trains and modernized stations has improved passenger experiences, making rail travel more efficient and comfortable.

With reference to above case study, answer the following questions:

(i) What challenges did Indian Railways face as a public sector enterprise?

(ii) How did Indian Railways address environmental concerns?

(iii) What role do Public-Private Partnerships (PPPs) play in the modernisation of Indian Railways?

SILVER GROVE SCHOOL

CLASS IX – COMPUTER APPLICATIONS

SET – A

SAMPLE QUESTION PAPER – 2026–27

Time Allowed: 2 Hours Maximum Marks: 100

General Instructions

All questions are compulsory unless stated otherwise.

The paper is divided into Sections A, B, C and D.

The questions are based on the prescribed Class IX Computer Applications syllabus.

Write Java programs using proper syntax and meaningful variable names.

Assume suitable data wherever necessary.

The intended marks for questions or parts of questions are given in brackets [].

SECTION A – OBJECTIVE TYPE QUESTIONS

Question 1

(a) Choose the correct option. [10 × 1 = 10]

1. Which of the following is a principle of Object Oriented Programming?

a) Compilation b) Encapsulation c) Execution d) Interpretation

2. A class can best be described as a:

a) Variable b) Blueprint for creating objects c) Loop d) Operator

3. Which of the following is a valid Java identifier?

a) 2value b) class c) totalMarks d) total-marks

4. Which data type is used to store a single character?

a) String b) char c) Character d) text

5. Which operator is used for equality comparison in Java?

a) = b) == c) != d) equals

6. Which method is used to read an integer using the Scanner class?

a) getInt() b) readInt() c) nextInt() d) inputInt()

7. Which class contains mathematical methods such as sqrt() and pow()?

a) Scanner b) System c) Math d) Number

8. Which of the following is an example of explicit type conversion?

a) int x = 10; b) double d = 10; c) int n = (int) 12.5; d) char c = 'A';

9. Which operator increases the value of a variable by 1?

a) -- b) ++ c) += d) **

10. The Java Virtual Machine is commonly abbreviated as:

a) JDK b) JVM c) JRE d) JIT

(b) Fill in the blanks. [5 × 1 = 5]

The process of hiding the internal implementation details of an object is called _____.

A Java program is first converted into _____ code.

The _____ operator is used to access members of a class or object.

The escape sequence \n is used for _____.

The Scanner class belongs to the _____ package.

(c) State whether the following statements are True or False. [5 × 1 = 5]

A class is an instance of an object.

Java is a platform-independent language.

The = operator is used for comparison.

nextDouble() is used to accept a double value through Scanner.

Math.sqrt(25) returns 5.0.

SECTION B – SHORT ANSWER QUESTIONS

Question 2 [10]

Define Object Oriented Programming. [2]

State any two differences between Procedure Oriented Programming and Object Oriented Programming. [2]

Explain encapsulation with a suitable real-life example. [2]

What is inheritance? Give one example. [2]

What is polymorphism? [2]

Question 3 [10]

What is an object? [2]

What is a class? [2]

Distinguish between an object's state and behaviour. [2]

Why is a class called a blueprint for objects? [2]

Give two examples of objects and mention one attribute and one method for each. [2]

Question 4 [10]

What is a token in Java? Name its different types. [2]

Differentiate between a variable and a constant. [2]

What is Unicode? How is it different from ASCII? [2]

Write the purpose of the following escape sequences: \n and \t. [2]

Differentiate between primitive and non-primitive data types. [2]

SECTION C – JAVA CONCEPTS AND OUTPUT

Question 5 [10]

(a) Find the output. [3]

```
int a = 12; int b = 5;
```

```
System.out.println(a + b);
```

```
System.out.println(a / b);
```

```
System.out.println(a % b);
```

(b) Find the output. [2]

```
int x = 8; System.out.println(x++);
```

```
System.out.println(++x);
```

(c) Evaluate the following expressions. [5]

$15 + 4 * 3$

$(15 + 4) * 3$

$20 / 3$

$20 \% 3$

$5 > 3 \ \&\& \ 8 < 10$

Question 6 [10]

Name the three forms of operators based on the number of operands. [3]

Explain the difference between prefix and postfix increment operators with an example. [2]

What is the purpose of the new operator in Java? [2]

What is the dot (.) operator used for? [1]

Differentiate between implicit and explicit type conversion with one example each. [2]

SECTION D – PROGRAMMING IN JAVA

Question 7 [10]

Write a Java program to accept the length and breadth of a rectangle and calculate and display:

Area

Perimeter

Use the Scanner class for input.

Question 8 [10]

Write a Java program to accept a student's marks in three subjects and calculate:

Total marks

Average marks

Percentage

Display all three results appropriately.

Question 9 [10]

Write a Java program to accept a positive number and display:

Its square

Its cube

Its square root

Its value raised to the power 3

Use suitable methods of the Math class.

Question 10 [10]

Write a Java program to accept two numbers and display:

Sum

Difference

Product

Quotient

Remainder

Use the Scanner class for accepting input.

SET – A | CLASS IX | COMPUTER APPLICATIONS

HISTORY & CIVICS QUESTION PAPER

Instructions to Candidates:

Answers to this Paper must be written on the answer sheet provided separately.

You must NOT start writing during reading time.

The time given at the head of this Paper is the time allowed for writing the answers.

Attempt all questions from Part I and Part II.

The intended marks for questions or parts of questions are given in brackets [].

Part I ($10 \times 1 = 10$ Marks)

Q1. Choose the correct answer:

1. The Constituent Assembly of India held its first meeting on:

- a) 15th August 1947 b) 9th December 1946
- c) 26th November 1949 d) 26th January 1950

2. Which of the following was an important feature of Harappan drainage system?

- a) Open drains only b) Covered drainage system
- c) Wooden drains d) Irrigation canals

3. The oldest Veda among the four Vedas is:

- a) Samaveda b) Yajurveda
- c) Rigveda d) Atharvaveda

4. The capital of the Mauryan Empire under Ashoka was:

- a) Ujjain b) Taxila
- c) Pataliputra d) Mathura

5. The famous 'Priest-King' statue was discovered at:

- a) Lothal b) Harappa
- c) Mohenjodaro d) Kalibangan

6. The 24th Tirthankara of Jainism was:

- a) Parshvanatha b) Mahavira
- c) Rishabhanatha d) Ajitanatha

7.The founder of the Mauryan Empire was:

- a) Ashoka b) Bindusara
- c) Chandragupta Maurya d) Pushyamitra Shunga

8.The Gupta ruler famous for his achievements and patronage of art and culture was:

- a) Chandragupta II b) Harshavardhana
- c) Bimbisara d) Ajatashatru

9.Sangam literature provides valuable information about ancient:

- a) North India b) South India
- c) Central Asia d) Bengal

10.Fundamental Rights in the Indian Constitution are primarily intended to:

- a) Establish military rule b) Protect individual liberty
- c) Promote monarchy d) Establish a theocratic state

Q2. Short Answer Type Questions

(10 × 2 = 20 Marks)

- a. Mention any two important features of Harappan architecture.
- b. What was the position of women during the Early Vedic Period?
- c. What is meant by the term Varna system?
- d. What are the Three Jewels (Triratna) of Buddhism?
- e. What is Nirvana according to Buddhism?
- f. What was the role of inscriptions in reconstructing the history of Ashoka?
- g. What were Stupas? Mention their religious significance.
- h. What is meant by Megalithic culture? Mention one feature of Megalithic burials.
- i. What is meant by Universal Adult Franchise?
- j. What is the significance of the Right to Equality in the Indian Constitution?

Part II – Section A

(10 Marks each question)

Q3. Answer the following:

With reference to Buddhism, answer the following questions:

- i. Where was Gautama Buddha born? What was his original name? (2)
- ii. What is meant by the Middle Path taught by Buddha? (2)
- iii. Mention any three reasons for the popularity of Buddhism in ancient India. (3)
- iv. What are the Eightfold Path? Mention any three elements of it. (3)

Q4. Answer the following:

- i. Name any two major cities of the Harappan Civilization. (2)
- ii. Mention two important features of the Later Vedic economy. (2)
- iii. Explain any three reasons for the emergence of new religious movements in the 6th century B.C. (3)
- iv. Describe any two important features of Harappan religious practices. (3)

Section B

(10 Marks each question)

Q5. Answer the following:

- i. Mention any two measures adopted by Ashoka for promoting Buddhism. (2)
- ii. What was the role of agriculture in Sangam economy? (2)
- iii. Write a short note on Fa-Hien's account of India during the Gupta period. (3)
- iv. Explain the military and diplomatic achievements of Chandragupta II. (3)

Q6. Picture-Based Question

Study the picture given below and answer the following:

[Picture of the Great Bath of Mohenjodaro]

- i. Identify the archaeological structure shown in the picture. (2)
- ii. Name the civilization to which this structure belongs. (2)
- iii. Mention any three architectural features of this structure. (3)
- iv. Explain how this structure helps historians understand the social and religious life of the Harappan people. (3)

Q7. Answer the following:

- i. Why is the Citadel considered an important feature of Harappan cities? (2)

- ii. What were the major contributions of Varahamihira to the Gupta-age scientific tradition? (2)
- iii. Compare the political organization of the Early Vedic and Later Vedic periods. (3)
- iv. Examine the importance of the Prayaga Prashasti (Allahabad Pillar Inscription) in understanding the reign and conquests of Samudragupta. (3)

Sample paper

Half-Yearly Examination 2026–27

Duration: 150 minutes

Section I: 9 questions, 80 marks

Section II: 2½ questions (Choose any one question from the following 15 questions)

Section III: 5 questions:

1. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (15 marks)
2. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (15 marks)
3. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (15 marks)
4. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (15 marks)
5. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (15 marks)

Section IV – 1 question (Choose any one question from the following) [30 marks]

Section V: 1. The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (150–200 marks) [10]

(a) The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (150–200 marks)

(b) The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (150–200 marks)

(c) The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (150–200 marks)

(d) The Gupta period is known for its scientific achievements. Discuss the contributions of Varahamihira and Aryabhata. (150–200 marks)

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CLASS IX

ENGLISH LANGUAGE

ENGLISH Paper – 1

(Two hours)

General Instructions:

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Attempt all five questions.

The intended marks for questions or parts of questions are given in brackets [].

You are advised to spend not more than 30 minutes in answering Question 1 and 20 minutes in

answering Question 2.

Question 1

(Do not spend more than 30 minutes on this question.)

Write a composition (300 - 350 words) on any one of the following: [20]

- (a) Write an original short story which clearly illustrates the friendship between a boy and his dog.
- (b) You mistakenly went to your school on a day which was a holiday. Everything was closed and the school was empty. Write a description of what you saw and heard. What were your feelings at the end of the visit?
- (c) Your room has been very untidy for a long time and your parents have been urging you to tidy it. Narrate your experience of cleaning and tidying your room. What did this experience teach you?
- (d) Express your views either for or against the statement:
“Life’s best lessons are learnt from friends.”

English Language Specimen Paper Class IX 2019 onwards 2

- (e) Study the picture given below. Write a short story or a description or an account of what it suggests to you. Your composition may be about the subject of the picture or you may take suggestions from it; however, there must be a clear connection between the picture and your composition.

Picture

Question 2

(Do not spend more than 20 minutes on this question.)

Select any one of the following: [10]

- (a) You have behaved very rudely to a friend. Write a letter to him / her apologizing for the rude behavior. Explain what happened and tell him / her what you plan to do to make amends.
- (b) You are in charge of the Nature Club in your locality. Write a letter to the Secretary of the Sports Club in the neighbourhood requesting permission to hold a Nature Fest on the club grounds nearby. Give details of your plans for the event.

Question 3

- (a) Your school is hosting an Inter-school music competition. Write out a notice to be put up in your school informing students about the event and inviting them to participate in the Inter-school music competition. [5]

(b) Write an e-mail to the Principal of a neighbouring school requesting him / her to send a team to participate in the event. [5]

Question 4

Read the following passage carefully and answer the questions that follow:

With dry lips, parched throat, and ink-stained fingers, and exhaustion on one side and exaltation on the other, Swaminathan strode out of the examination hall on the last day. Standing in the veranda, he turned back and looked into the hall and felt slightly uneasy. He would have felt more comfortable if all the boys had given their papers as he had done, twenty minutes before time. With his left

shoulder resting against the wall, Sankar was lost to the world. Rajam, sitting under the second ventilator, between two third-form boys, had become a writing-machine. Mani was still gazing at the rafters, scratching his chin with

the pen. The Pea was leaning back in his seat, revising his answers. One supervisor was drowsing in his chair; another was pacing up and down with an abstracted look in his eyes. The scratchy noise of active nibs, the rustle of

papers, and the clearing of the throats, came through the brooding silence of the hall.

Swaminathan suddenly wished that he had not come out so soon. But how could he have stayed in the hall longer? The Tamil paper was set to go on till five o'clock. He had found himself writing the last line of the last question at four-thirty. Out of the six questions set, he had answered the first question to his satisfaction, the second was doubtful, the third was satisfactory, the fourth he knew was clearly wrong (but then, he did not know the correct

answer).

The sixth answer was the best of the lot. It took only a minute to answer it.

He had read the question at two minutes to four-thirty, started to answer a minute later, and finished it at four-thirty.

He had found it hard to kill time. Why wasn't the paper set for two and a half hours instead of three? He had looked wistfully at the veranda outside. If only he could pluck up enough courage to hand in the paper and go out – he would have no more examinations for a long time to come – he could do what

he pleased – roam about the town in the evenings and afternoons and

mornings – throw away the books – command Granny to tell endless tales.

He had seen a supervisor observing him, and had at once pretended to be busy with the answer paper. He thought that while he was about it, he might as well do a little revision. He read a few lines of the first question and was

bored. He had to pretend that he was revising. He set his pen to work. He went on improving the little dash under the last line indicating the end, till it became an elaborate complicated pattern.

He had looked at the clock again, thinking that it must be nearly five now. It was ten minutes past four-thirty. He saw two or three boys giving up their papers and going out, and felt happy. He briskly folded the paper and wrote

his name.

The bell rang. In twos or threes the boys came out of the hall. It was a thorough contrast to the preceding three hours. There was din of excited chatter.

(a) Give the meaning of the following words as used in the passage: (3)

One word answers or short phrases will be accepted.

(i) pacing (line 11)

(ii) wistfully (line 26)

(iii) din (line 42)

(b) Answer the following questions briefly in your own words.

(i) Why did Swamy feel slightly uneasy as soon as he came out of the examination hall? [2]

(ii) Why did he think he had answered the sixth question best of all? [1]

(iii) What did he plan to do with his books once the examination was over? [2]

(iv) Which word in the passage tells you that Swami used to bully his grandmother? [2]

(v) Why do you think Swami drew an elaborate complicated pattern after his last answer? [2]

(c) In not more than 50 words, describe what Swami's classmates and supervisors were doing in the examination hall. [8]

Question 5

(a) Fill in each of the numbered blanks with the correct form of the word given in brackets. Do not copy the passage, but write in correct serial order the word or phrase appropriate to the blank space. [4]

Example:

(0) looked

Suraj (0) _____ (look) out of the door. He (1) _____ (catch) sight of the board (2) _____ (bear) the station's name. He was so (3) _____ (astonish) that he almost (4) _____ (fall) out of the compartment. He was back in his home town! After (5) _____ (travel) for forty or fifty kilometers, here he (6) _____ (is) home again. He (7) _____ (can) not understand it. He (8) _____ (climb) out of the compartment slowly.

(b) Fill in each blank with an appropriate word: [4]

(i) Bobby waited in front _____ the school.

(ii) The children were told to return home _____ it became dark.

(iii) He wore an old muffler wrapped _____ his neck.

(iv) We saw the bird fly high _____ the tower and disappear.

(v) Music therapy is a cure _____ many ills.

(vi) The thief ran _____ the staircase and out into the yard.

(vii) Mr. Roy jumped into his car and drove _____ as fast as he could.

(viii) Please do not get carried _____ by these rumours.

(c) Join the following sentences to make one complete sentence without using and, but or so:

[4]

- (i) The teacher arrived. The class started.
- (ii) The drive was so tedious. I fell asleep on the backseat.
- (iii) He was found in possession of the stolen goods. He was punished.
- (iv) Stop talking. Leave the classroom.
- (d) Re-write the following sentences according to the instructions given after each. Make other changes that may be necessary, but do not change the meaning of each sentence.[8]
- (i) "I saw a panther this morning", he said modestly.
(Rewrite using indirect speech.)
- (ii) Kiran is the fastest runner in our school.
(Begin: No other.....)
- (iii) Susan hid her grandmother's spectacles.
(Begin: Her grandmother's.....)
- (iv) Ali was too embarrassed to speak clearly.
(Begin: Ali was so.....)
- (v) As soon as the election results were out, the victory procession started.
(Begin: No sooner.....)
- (vi) Ranji prefers reading a book to watching a movie.
(Begin: Ranji would rather.....)
- (vii) Anu does not study enough, but she still stands first.
(Begin: Despite.....)
- (viii) If Aruna practices, she will win the competition.
(Begin: Unless.....)

SILVER GROVE SCHOOL

CLASS IX

SAMPLE PAPER
(ENGLISH PAPER – 2)

The paper consists of four Sections.

SECTION A

(Attempt all questions from this Section.)

Question 1

Read the following questions and choose the most appropriate response from the choices given below.

(i) Why does Cassius send notes through Cinna, at the end of Act I?

- (a) to warn Caesar about Brutus' betrayal so that he could take necessary action
- (b) to assure Brutus that plans for the conspiracy were in place
- (c) to remind Caesar to meet at the Capitol at the appointed time
- (d) to convince Brutus that the Romans needed him to join the conspiracy

(ii) Why does Brutus fear the people will Choose Caesar for their king?

- (a) He heard loud shouting from the Capitol and crowd cheering Caesar
- (b) He saw Caesar wearing a crown
- (c) Flavius informed him about the Senate's decision
- (d) He saw Caesar returning victorious from war

(iii) "I would have had thee there and here again / Ere I can tell thee what thou shouldst do there." These lines tell us that Portia is feeling.

- (a) angry
- (b) weak

- (c) sad
- (d) anxious

(iv) Which of the following lines reflects Caesar's arrogance?

- (a) Danger knows full well that Caesar is more dangerous than he
- (b) Go, bid the priest do present sacrifice
- (c) For thy humour, I shall stay at home
- (d) I am ashamed, I did yield to them

(v) Select the option that shows the correct relationship between statements (1) and (2).

Statement 1: Flavius tells Marullus that they would have to take all the decorations off Caesar's statues.

Statement 2: Flavius fears that Caesar's growing power would result in a life of servitude for all Romans. [ANALYSIS]

- (a) Statement 1 is true and Statement 2 is false
- (b) Statement 2 is true and Statement 1 is false
- (c) Statement 2 is the cause for Statement 1
- (d) Statement 1 and Statement 2 are independent of each other

(vi) What are the commoners celebrating in Act I, Scene 1? [RECALL]

- (a) Caesar's victory over the sons of Pompey
- (b) Caesar's victory over Pompey
- (c) The Feast of the Lupercal
- (d) The Ides of March

(vii) Choose the option that lists the sequence of events in the correct order:

- (i) He noticed a pink glow coming from a giant glass object in the middle of the bamboo grove.

(ii) When he stepped forward to take a closer look, he felt as if an electric shock had passed through his body.

(iii) He grew uneasy as he became aware of an eerie silence that had suddenly descended on the world.

(iv) Although it was a dark, moonless night, Bonku Babu chose to take the shortcut home.

(a) (i), (ii), (iii), (iv)

(b) (ii), (iii), (iv), (i)

(c) (iv), (iii), (i), (ii)

(d) (iv), (ii), (iii), (i)

(viii) At the meeting at Nupur Babu's place, everyone teased Bonku Babu because he was: [RECALL]

(a) a brilliant teacher

(b) very wealthy

(c) timid and credulous and believed whatever they told him

(d) a close friend of Ang

(ix) 'The bowls never needed washing, because the boys cleaned them with their spoons until they shone.' This line means that-

(a) The boys enjoyed washing their bowls

(b) The boys never got enough to eat

(c) The boys wanted to keep their bowls shiny

(d) The boys did not enjoy washing bowls

(x) In 'Oliver Asks for More', why did Oliver dare to ask for more gruel? [ANALYSIS]

(a) He was the greediest boy

(b) He was chosen by the other boys by lot to ask for more

(c) He wanted to annoy the master

(d) He was instructed by Mrs. Mann

(xi) Alan Trevor gave Hughie Erskine permanent entree to his studio because he liked his:

(a) generous recklessness

(b) careless kindness

(c) kind carelessness

(d) reckless humility

(xii) In 'The Model Millionaire', who was the beggar-model actually?

(a) Alan Trevor's brother

(b) Baron Hausberg, one of the richest men in Europe

(c) Hughie's father

(d) A professional model hired by Trevor

(xiii) What, according to Marge Piercy in A Work of Artifice, should begin very early with living creatures?

(a) trimming their branches

(b) teaching them life lessons

(c) assigning gender roles / stunting their growth

(d) preparing them for life's struggles

(xiv) Which of the following options contains the figure of speech that appears in the following line: '...where the sun came peeping in at morn...'

(a) A dozen eyeballs on the floor

(b) Tossing their heads in sprightly dance

(c) The tangled bine-stems scored the sky

(d) Personification

(xv) Which of the following tasks is NOT performed by Skimbleshanks in the poem?

- (a) Supervision of the driver
- (b) Supervision of the guards
- (c) Supervision of the bagmen
- (d) Supervision of the police

(xvi) In 'I Remember, I Remember' by Thomas Hood, the poet mainly contrasts:

- (a) a good postal system
- (b) the innocence and joy of childhood with the sorrow and disillusionment of adulthood
- (c) a strong industrial town
- (d) travelling by train at night

SECTION B

DRAMA

[Attempt Any One from the following given questions]

Question 2

Read the extract given below and answer the questions that follow:

_ Calpurnia: Alas! my Lord. Your wisdom is consum'd in confidence._

_ Do not go forth today: call it my fear_

_ That keeps you in the house, and not your own,_

_ We'll send Mark Antony to the Senate House_

(i) Where are the speakers? Describe the weather outside. What is Calpurnia trying to prevent Caesar from doing?

(ii) State two unusual things Calpurnia had heard of that made her fearful. What nightmare had she had?

(iii) How did Caesar calm his wife's fears? What does Calpurnia mean by "Your wisdom is consum'd in confidence"?

(iv) How does Decius interpret Calpurnia's dream?

(v) What does Caesar finally decide to do? What can you infer about his character from this decision? Mention two aspects of Calpurnia's character revealed in this scene.

Question 3

Read the extract given below and answer the questions that follow:

Brutus: What means this shouting? I do fear the people Choose Caesar for their king.

Cassius: Ay, do you fear it? Then must I think you would not have it so.

Brutus: I would not, Cassius; yet I love him well.

(i) Where are Brutus and Cassius? What does Brutus 'fear' is the reason for 'this shouting'? Later in the scene, Brutus hears a second shout. What does he think this is about?

(ii) Later in the scene, how do Brutus and Cassius come to know of the actual reason for all the shouting? Who gives them the details? How had they drawn this man's attention?

(iii) 'I would not Cassius, yet I love him well.' What does this line reveal about Brutus's mental state? How did Brutus describe his state of mind earlier in the scene?

(iv) What does Cassius say to prove that Caesar was as weak as any other human being? State any one physical disability of Caesar's that is mentioned in this scene.

(v) Important character traits of Cassius are revealed in this scene. Mention any two. What is your opinion of the man? Give a reason to justify your answer.

SECTION C

PROSE

(Answer one or more questions from this Section.)

Question 4

Read the following extract from Satyajit Ray's short story, Bonku Babu's Friend and answer the questions that follow:

__ "All at once, his ears began ringing. He felt as if someone was humming loudly --- a long, steady noise --- there was no way he could stop it." __

(i) Where was Bonku Babu at this moment? Why did he take that route that night?

(ii) What was happening to him? Who was causing this humming sound?

(iii) Describe the appearance of the creature / object Bonku Babu saw in the bamboo grove.

(iv) What did Ang tell Bonku Babu about why he had come to Earth? What instrument did he show him?

(v) How did this encounter change Bonku Babu's personality? What message does the author convey?

Question 5

Read the following extract from Charles Dickens' short story, *Oliver Asks for More* and answer the questions that follow:

__“The room in which the boys were fed, was a large stone hall, with a copper at one end: out of which the master, dressed in an apron for the purpose, and assisted by one or two women, ladled the gruel at mealtimes.”__

(i) Describe the system of feeding the boys in the workhouse.

(ii) What led Oliver to ask for more gruel? What was the immediate reaction of the master and the boys?

(iii) How did Mr. Bumble react to this incident? What did the parish officials decide about Oliver?

(iv) What does this extract reveal about the condition of workhouse children and the attitude of the authorities?

(v) Discuss Dickens' use of humour, irony and pathos in this chapter.

SECTION D

POETRY

(Answer one or more questions from this Section.)

Question 6

Read the following extract from Marge Piercy's poem, *A Work of Artifice* and answer the questions that follow:

__“The bonsai tree in the attractive pot could have grown eighty feet tall on the side of a mountain till split by lightning. But a gardener carefully pruned it. It is nine inches high.”__

- (i) What could the bonsai tree have become in its natural state? Why is it stunted?
- (ii) Explain the line: “They have trimmed it, pruned it, wired it into a shape of their own desire.”
- (iii) What does the bonsai tree symbolize in the poem? Who does the gardener symbolize?
- (iv) How is the condition of women similar to the bonsai tree? What are the ‘attractive pots’ for women in society?
- (v) What is the central idea of the poem? Bring out its relevance in modern times.

Question 7

Read the following extract from T.S. Eliot’s poem, Skimbleshanks: The Railway Cat and answer the questions that follow:

__“There’s a whisper down the line at 11.39 When the Night Mail is ready to depart,
Saying ‘Skimble where is Skimble has he gone to hunt the thimble? We must find him or
the train can’t start.’”__

- (i) Where is this poem set? What is the importance of 11.39?
- (ii) Why is Skimbleshanks considered so important for the train’s departure? What does he do before the train starts?

(iii) Describe Skimbleshanks' supervision of the driver, the guards and the bagmen.

(iv) How do the passengers and the police react to Skimbleshanks? Why?

(v) What kind of character is Skimbleshanks? How does Eliot use humour and personification to make him memorable?

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question 1: Multiple Choice Questions [15 Marks]

Which of the following cell organelles is responsible for initiating cell division in animal cells?

- (a) Centrosome. (b) Lysosome
(c) Ribosome (d) Plastid

The tissue responsible for the increase in the girth (width) of a plant stem is: * (a) (a) Apical meristem (b) Lateral meristem

- (c) Intercalary meristem (d) Parenchyma

A flower that possesses both stamens and carpels is called:

- (a) Unisexual (b) Bisexual
(c) Neutered (d) Staminate

A part of the embryo that grows into the root system upon germination is the: * (a) Plumule (b) Radicle

- (c) Cotyledon (d) Endosperm

During double fertilization in angiosperms, the second male gamete fuses with the:

- (a) Egg cell (b) Synergids
(c) Polar nuclei (d) Antipodal cells

The structural and functional unit of life is:

- (a) Tissue
- (b) Organ
- (c) Cell
- (d) Organism

Which plant tissue contains cells with heavily thickened lignified walls and no intercellular spaces?

- (a) Collenchyma
- (b) Parenchyma
- (c) Sclerenchyma
- (d) Xylem parenchyma

The protective, outermost layer of a seed coat is known as the:

- (a) Tegmen
- (b) Testa
- (c) Micropyle.
- (d) Hilum

Brightly colored petals in a flower are an evolutionary adaptation for:

- (a) Wind pollination
- (b) Insect pollination
- (c) Water pollination
- (d) Self-pollination

The type of germination where cotyledons are pushed above the ground is:

- (a) Hypogeal
- (b) Epigeal
- (c) Viviparous
- (d) None of the above

Which of the following parts of a flower forms the fruit after fertilization?

- (a) Ovule.
- (b) Ovary
- (c) Style
- (d) Stigma

The tissue that lines our blood vessels and lines internal organ tracks is:

- (a) Connective tissue
- (b) Epithelial tissue
- (c) Muscular tissue.
- (d) Nervous tissue

Plasmolysis occurs when a living plant cell is placed in a:

- (a) Hypotonic solution
- (b) Isotonic solution
- (c) Hypertonic solution
- (d) Pure water solution

A seed that contains a single cotyledon is categorized as:

- (a) Dicotyledonous
- (b) Monocots
- (c) Polycotyledonous
- (d) Non-endospermic

The protective sheath covering the embryonic shoot tip in monocot seeds is the: (a) Coleorhiza (b) Coleoptile (c) Scutellum (d) Aleurone layer

Question 2 [25 Marks]

(a) Assertion-Reason Type Questions [5 Marks]

Directions: Select the correct option:

- (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,
- (c) A is true but R is false,
- (d) A is false but R is true. 1. Assertion (A): Mitochondria are known as the powerhouses of the cell.

1. Reason (R): Cellular respiration takes place in mitochondria, releasing energy in the form of ATP.

Assertion (A): Xylem transport is mostly bidirectional.

2. Reason (R): Xylem is a complex permanent tissue consisting of tracheids and vessels.

3. Assertion (A): Hydrophilous flowers produce large amounts of pollen grains.

Reason (R): Water currents are unpredictable, leading to significant wastage of pollen.

4. Assertion (A): Maize grain is technically a fruit and not a true seed.

Reason (R): In a maize grain, the seed coat and the fruit wall (pericarp) are completely fused.

5. Assertion (A): Self-pollination ensures massive genetic variations in the offspring.

Reason (R): Self-pollination involves the transfer of pollen grains to the stigma of the same flower.

(b) Find the Odd One Out and Give a Reason [5 Marks]

1. Mitochondria, Chloroplast, Cell wall, Nucleus.

Parenchyma, Sclerenchyma, Collenchyma, Cambium.

Calyx, Corolla, Stamens, Sepals.

Testa, Tegmen, Micropyle, Plumule.

Blood, Cartilage, Bone, Striated Muscle.

(c) Match the Columns [5 Marks] Match the items in Column A with the definitions in Column B.

Column A

Column B

1. Lysosome

(A) Translocation of prepared organic food items

2. Phloem

(B) Female reproductive organ of a flower

3. Pistil

(C) Suicidal bags containing hydrolytic enzymes

4. Pea seed

(D) Non-endospermic seed

5. Chloroplast

(E) Site of photosynthesis in a green plant cell

(d) Fill in the Blanks (Paragraph Format) [5 Marks] During the lifecycle of a flowering plant, (1) _____ is the transfer of pollen grains from the anther to the stigma. Once settled, the pollen grain germinates to produce a (2) _____ that travels down the style. It enters the ovule, where one male gamete fuses with the egg cell to form a (3) _____. After fertilization, the ovule develops into a (4) _____ and the ovary ripens to form the (5) _____.

(e) Analytical / Situation-Based Case Study [5 Marks] Read the situational passage carefully and answer the five single-mark questions that follow:

Situation: Rohan sets up an experiment with three groups of healthy bean seeds to study the criteria needed for seed growth. Group X seeds are placed on dry cotton at 25°C. Group Y seeds are placed on moist cotton inside a refrigerator maintained at 4°C.

Group Z seeds are placed on moist cotton at 25°C. After five days, Rohan observes that only the seeds in Group Z have germinated successfully.

Why did the seeds in Group X fail to germinate despite being kept at a warm, favorable room temperature 25°C?

Which essential factor required for physiological enzymatic activation during seed germination was missing for Group Y?

What term is used to describe the inactive, resting metabolic state of a seed before it encounters favorable germination criteria?

If Group Z seeds were completely submerged under water in a sealed vial, would they still germinate? Give an analytical reason.

Name the biological physiological process by which the dry seed coat initially absorbs water rapidly, causing it to swell up.

SECTION B (40 Marks)

(Answer any four questions from this Section)

Question 3

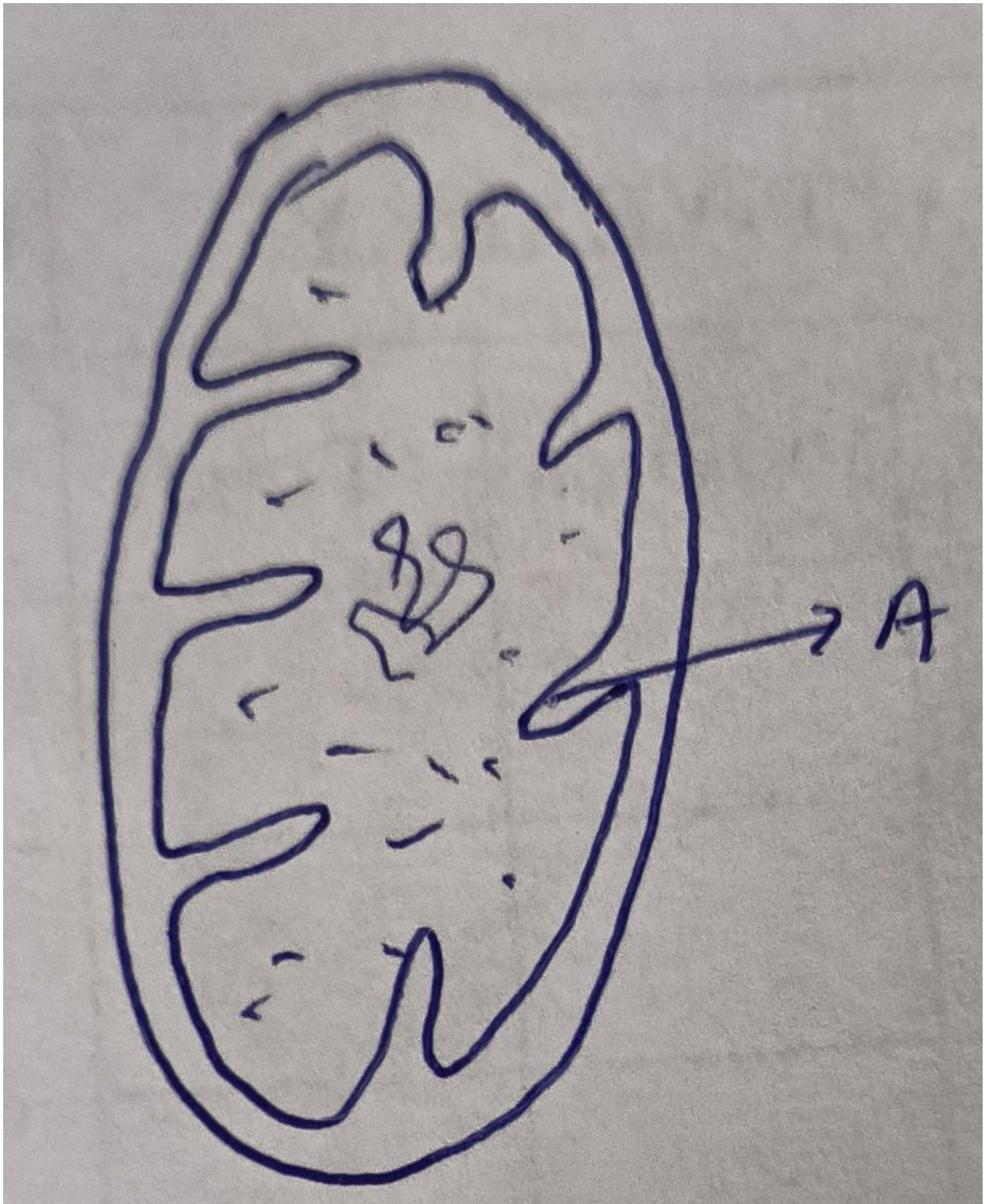
(i) Define the term gene.

(ii) State any two structural differences between Prokaryotic and Eukaryotic cells.
[2]

(iii) Mention the specific function of: (a) Ribosomes, (b) Golgi apparatus. [2]

(iv) Define the term Tissue. Why do multicellular organisms require division of labor? [2]

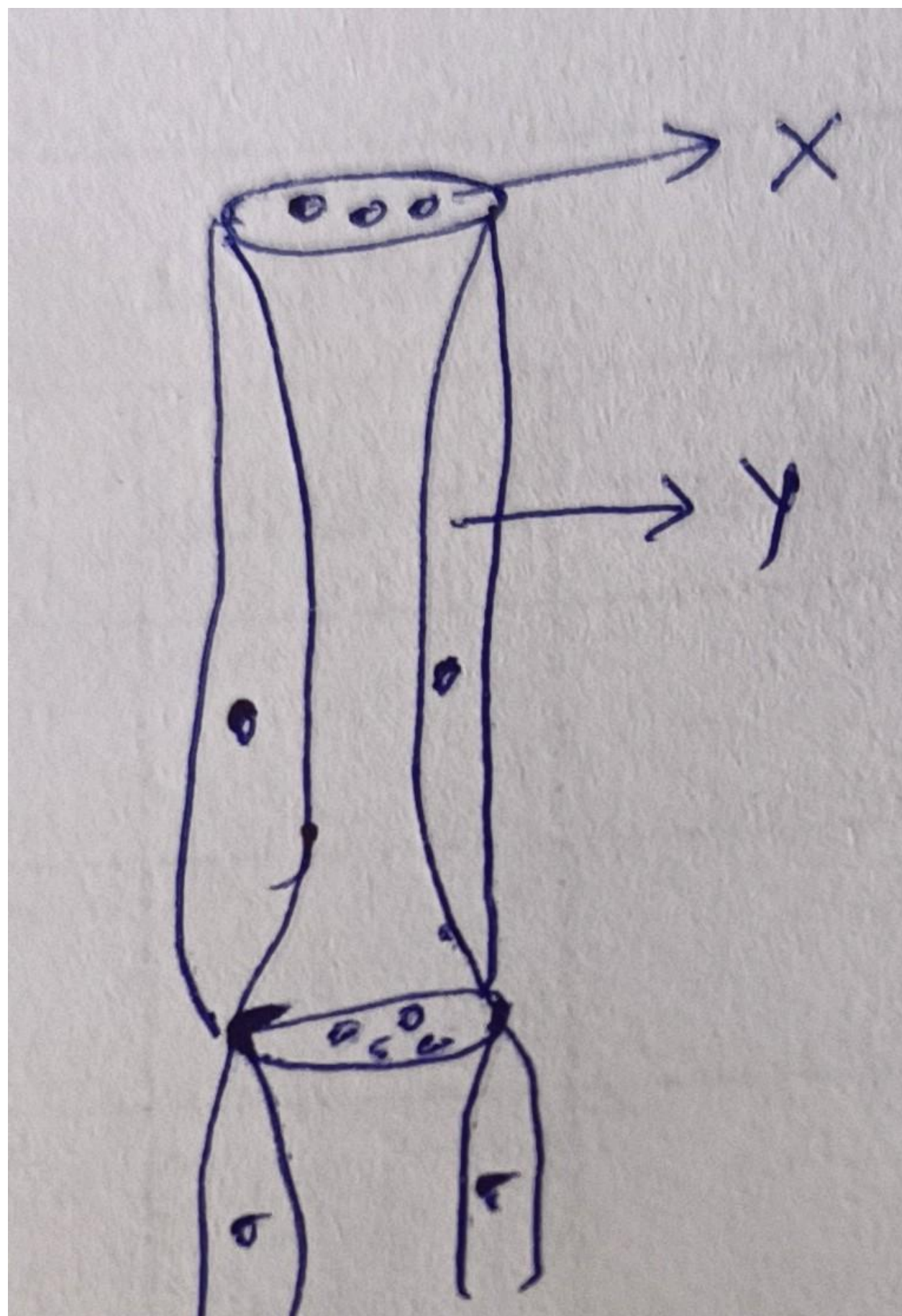
(v) Study the diagram of a cell organelle below and answer the questions:



- (a) Identify the double-membrane organelle shown.
- (b) Label the internal finger-like folds marked as fold structure 'A'.
- (c) Why does this organelle contain its own DNA and ribosomes?

Question 4

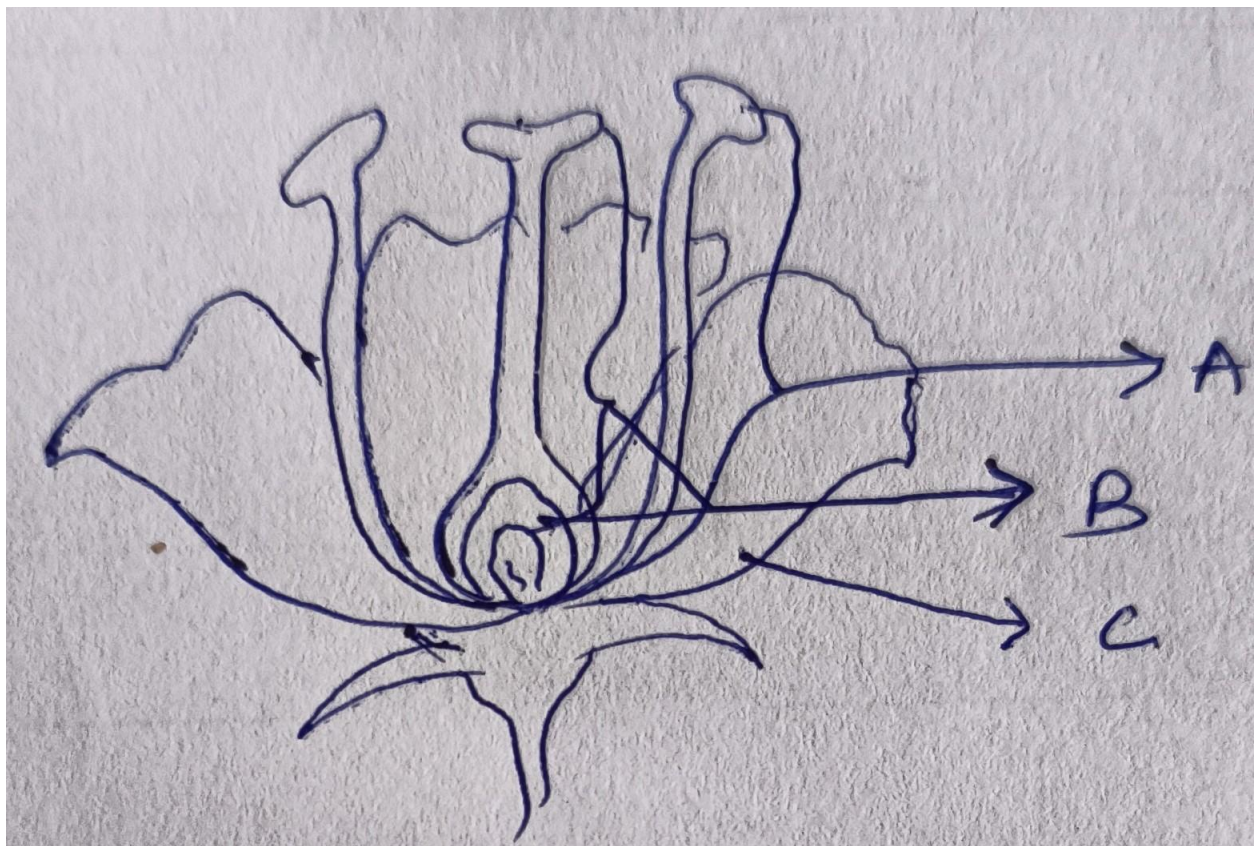
- (i)..Define the term Inflorescence. [1]
- (ii) Distinguish between Meristematic tissue and Permanent tissue. [2]
- (ii) Name the elements that make up the Xylem tissue. [2]
- (iv) What is a flower? Why is it structurally considered a modified shoot? [2]
- (v) Study the given diagram of a specialized plant tissue and answer the questions:



- (a) Identify the type of complex permanent tissue shown in the image.
- (b) Label the structural parts marked as X (perforated plate) and Y (adjacent narrow cell).
- (c) Is the conduction of food through this tissue active or passive?

Question 5

- (i). State one evolutionary advantage of cross-pollination. [1]
- (ii) Differentiate between Self-pollination and Cross-pollination based on their definitions. [2]
- (iii) List two morphological characteristics of insect-pollinated (entomophilous) flowers. [2]
- (iv) What is Herkogamy? How does it mechanically prevent self-pollination? [2]
- (v) Study the schematic diagram of a flower cross-section below and answer the questions:



- (a) Label the reproductive whorls A and B
- (b) Name the exact structural chamber inside part B where ovules are attached.

(c) State the role of the brightly colored non-essential accessory whorl C.

Question 6

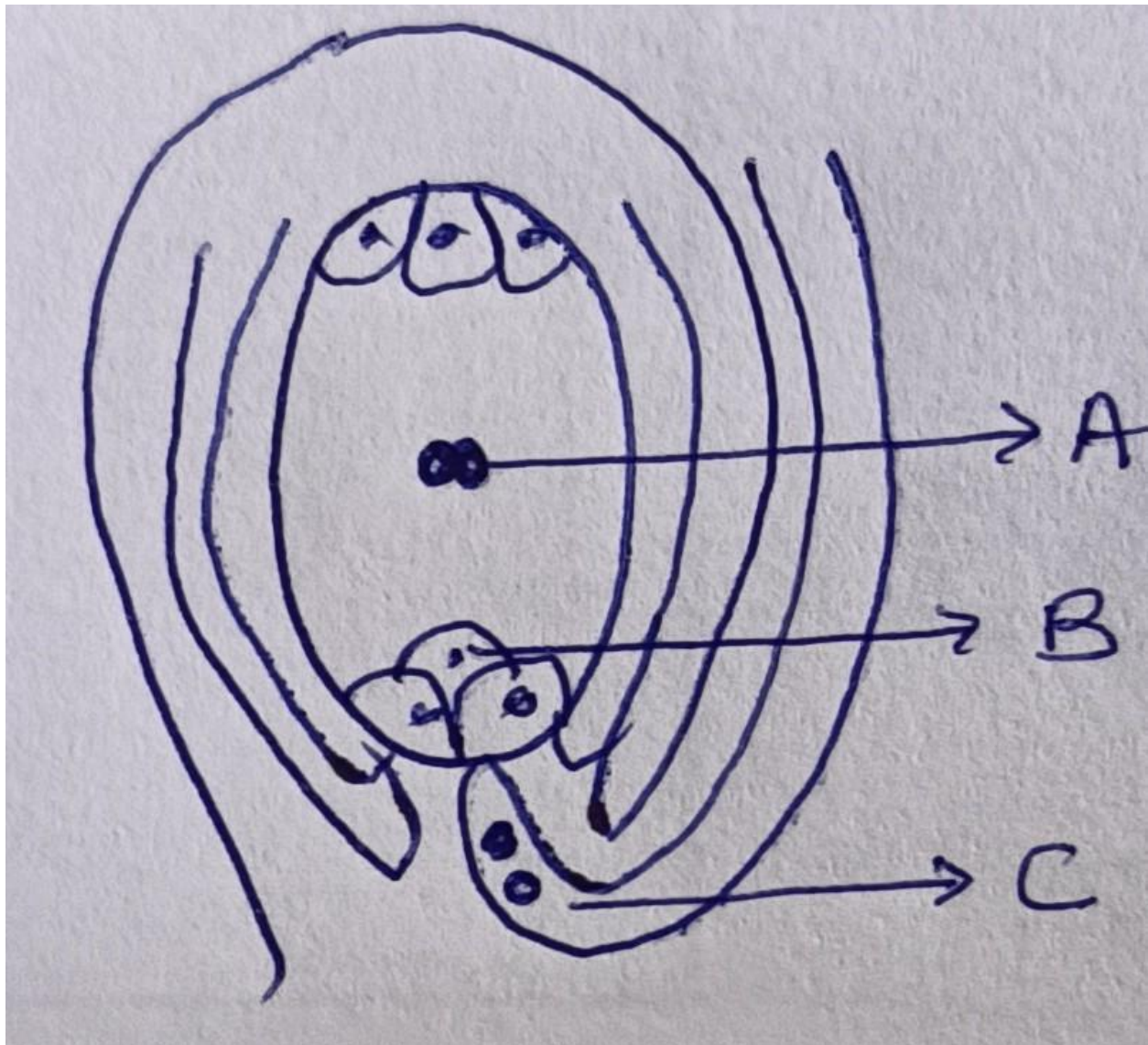
(i).What is the function of the Micropyle during seed germination? [1]

(ii) Explain the process of Double Fertilization in angiosperms. [2]

(iii) What happens to the following parts of a flower after fertilization? (a) Ovule, (b) Ovary wall. [2]

(iv) Define Germination. List the three essential external criteria required for a seed to germinate. [2]

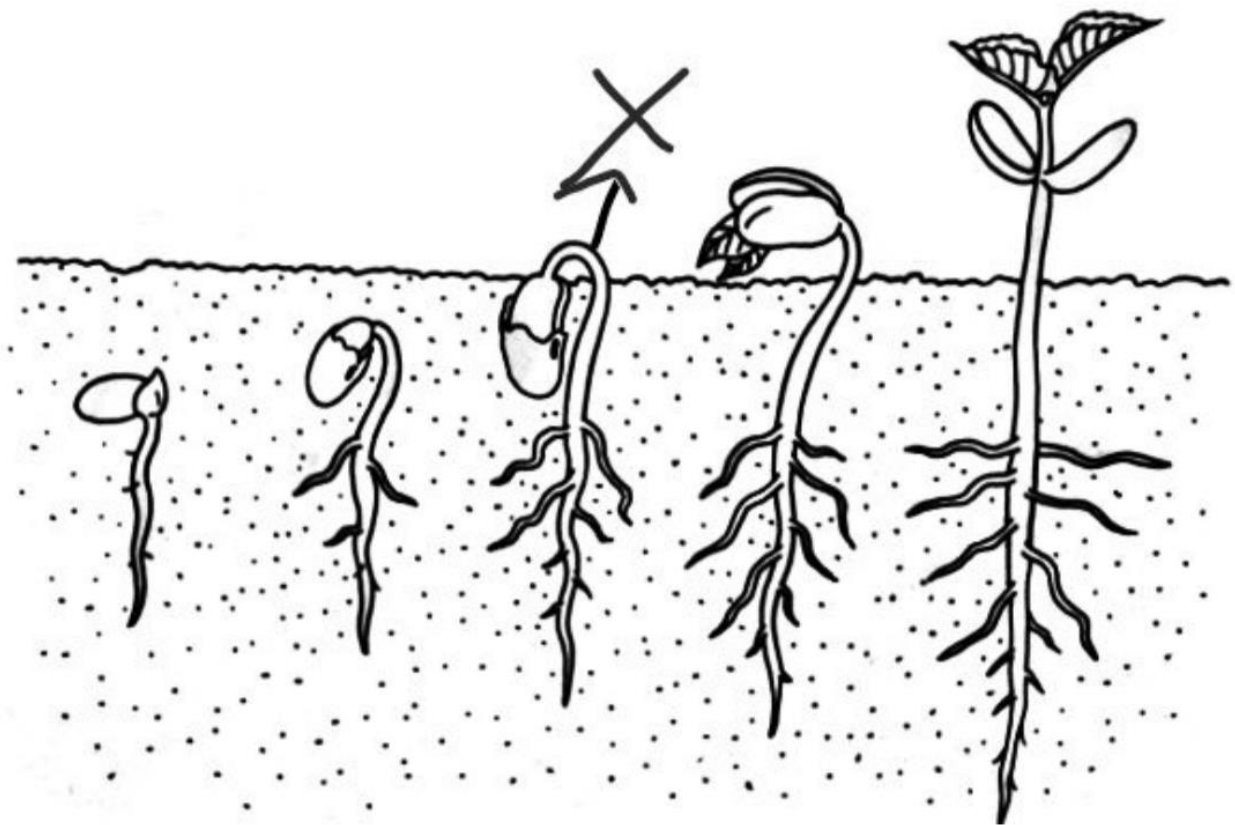
(v) Observe the diagram of an embryo sac during fertilization and answer the questions:



- (a) Identify the target cells labeled as A and B
- (b) What ploidy (n , $2n$, or $3n$) is achieved after the second male gamete fuses with center cell A?
- (c) Name the tube structure C that carries the male gametes down through the style tissue.

Question 7

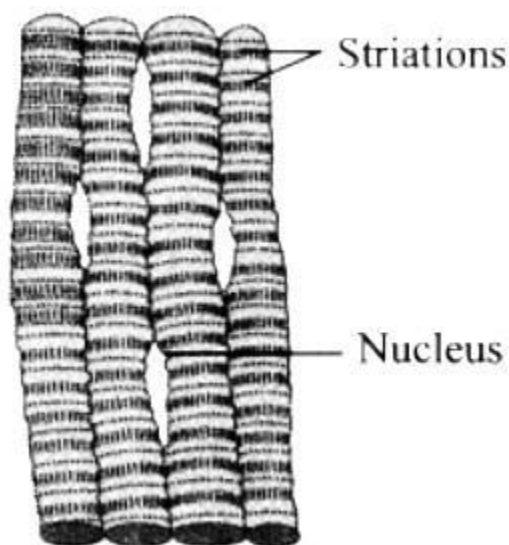
- (i). Why is agricultural soil loosened or ploughed before sowing seeds? [1]
- (ii) Differentiate between Epigeal and Hypogeal germination with an example of each. [2]
- (iii) What is a Dicotyledonous seed? Name any two dicot seeds. [2]
- (iv) Describe the structures that make up the embryo axis of a seed. [2]
- (v) Study the structure of a germinating bean seed shown below and answer the questions:



- (a) Identify the specific type of germination shown in the figure.
- (b) Label the curved, looping embryonic axis part marked as X.
- (c) Why do the cotyledons eventually turn green, then wither and fall off?

Question 8

- (i).What is the main function of the Endosperm tissue in a maize grain? [1]
- (ii) State the cell theory. Name the two scientists who proposed it. [2]
- (iii) Write the general features of phylum porifera [2]
- (iv) Name and define the structural difference between a true fruit and a false fruit. [2]
- (v) Study the diagram of a structural tissue from an animal body and answer the questions:



- (a) Identify the specific muscular tissue shown in the diagram.
- (b) Note the dark bands running across. What are these structural stripes called?
- (c) State whether this muscle functions voluntarily or involuntarily.

SECTION A (40 Marks)*(Attempt all questions from this Section)***Question 1**

Choose the correct answers to the questions from the given options: [15]

1. A body is pivoted at a point. A force of 10 N is applied at a distance of 40 cm from the pivot. The moment of force generated is:
(a) 400 N m (b) 4 N m
(c) 0.4 N m (d) 40 N m
2. The center of gravity of a uniform hollow sphere lies at:
(a) Its bottom-most point (b) Its geometric center
(c) Its top surface (d) Outside the sphere
3. A machine has a mechanical advantage (MA) equal to 1. If its efficiency is 100%, its velocity ratio (VR) is:
(a) 1 (b) Greater than 1
(c) Less than 1 (d) Zero
4. Which of the following single movable pulley systems acts as a force multiplier?
(a) A fixed pulley used with a movable pulley (b) A single fixed pulley with direct upward effort
(c) A single movable pulley where effort is applied in the direction of load (d) A single movable pulley where effort is applied vertically upwards
5. A body of mass 2 kg is raised to a height of 5 m. The work done against gravity is ($g = 10 \text{ m s}^{-2}$):
(a) 100 J (b) 10 J
(c) 50 J (d) 20 J
6. The relation between kinetic energy (K) and linear momentum (p) for a body of mass m is given by:
(a) $K = \sqrt{2mp}$ (b) $p = \sqrt{2mK}$
(c) $p = 2mK$ (d) $K = 2mp^2$
7. When light travels from a denser medium to a rarer medium, its velocity:
(a) Decreases (b) Increases
(c) Remains unchanged (d) First decreases then increases
8. A ray of light passes undeflected through a lens. The ray passes through the:
(a) Focus (b) Center of curvature
(c) Optical center (d) Principal axis
9. A convex lens forms a real, inverted image of the same size as the object. The object is placed at:
(a) F_1 (b) Beyond $2F_1$

- (c) At $2F_1$ (d) Between F_1 and $2F_1$
10. The phenomenon responsible for the twinkling of stars is:
 (a) Total internal reflection (b) Atmospheric refraction
 (c) Dispersion of light (d) Scattering of light
11. Which electromagnetic wave has the maximum wavelength among the following?
 (a) Ultraviolet rays (b) Gamma rays
 (c) Microwaves (d) X-rays
12. The critical angle for glass-air interface depends on:
 (a) Angle of incidence (b) Color (wavelength) of light
 (c) Intensity of light (d) Area of glass surface
13. For a prism placed in the minimum deviation position, the angle of incidence (i_1) and angle of emergence (i_2) satisfy:
 (a) $i_1 > i_2$ (b) $i_1 < i_2$
 (c) $i_1 = i_2$ (d) $i_1 + i_2 = 90^\circ$
14. Power of a concave lens of focal length 50 cm is:
 (a) +2 D (b) -2 D
 (c) +0.5 D (d) -0.5 D
15. Infrared radiation can be detected using a:
 (a) Quartz prism (b) Silvered mirror
 (c) Thermopile (d) Photographic film directly

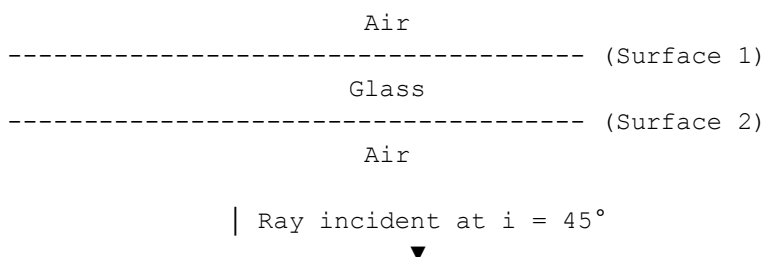
Question 2

- (a) A uniform meter rule of weight 100 gf is balanced horizontally on a knife-edge at the 40 cm mark when a weight of W is suspended from the 10 cm mark. Draw a clear diagram showing the forces acting on the rule and calculate the value of W . [3]
- (b) State two conditions required for a body to be in static equilibrium. [2]
- (c) 1. Why is the mechanical advantage of a class III lever always less than 1?
 2. Give one example of a class III lever used in daily life. [2]
- (d) A block and tackle system has 5 pulleys. If an effort of 120 N is required to lift a load of 500 N, calculate:
 1. Mechanical Advantage (MA)
 2. Velocity Ratio (VR)
 3. Efficiency (η) of the system [3]

Question 3

- (a) A ball of mass 200 g falls freely from a height of 20 m. Calculate its kinetic energy when it reaches halfway down. ($g = 10 \text{ m s}^{-2}$). [2]
- (b) Name the energy transformations taking place in the following cases:
 1. Charging a lead storage battery.
 2. An oscillating simple pendulum passing through its mean position. [2]

- (c) A ray of light enters an equilateral glass prism at an angle of incidence of 48° and suffers minimum deviation. Calculate the angle of minimum deviation (δ_m). [2]
- (d) 1. Complete the ray diagram given below showing the path of the ray through the glass block until it emerges out into air.
2. Define critical angle. [2]



- (e) State two safety precautions to be taken while handling electromagnetic radiations of high frequency like Gamma rays. [2]

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question 4

- (a) 1. Define clockwise and anticlockwise moments.
2. State the Principle of Moments. [3]
- (b) A body of mass 5 kg is dropped from a height of 10 m. Calculate:
1. Its potential energy at the highest point.
2. Its kinetic energy just before hitting the ground.
3. Its speed just before hitting the ground. ($g = 10 \text{ m s}^{-2}$) [3]
- (c) 1. Draw a neat labeled diagram of a single movable pulley connected with a single fixed pulley.
2. Derive an expression for its Mechanical Advantage assuming the system is ideal. [4]

Question 5

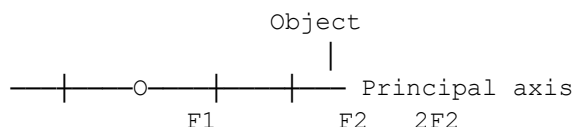
- (a) Define work. State the mathematical conditions under which work done by a force is:
1. Maximum positive
2. Zero [3]
- (b) An engine pumps 1200 kg of water to a height of 10 m in 1 minute. Calculate:
1. Work done by the engine ($g = 10 \text{ m s}^{-2}$)
2. Power rating of the engine in Watts (W) [3]
- (c) 1. State the Law of Conservation of Energy.
2. Show mathematically that the total mechanical energy ($E = U + K$) remains conserved for a freely falling body of mass m at three different positions along its path (Top point A, Middle point B, and Ground point C). [4]

Question 6

- (a) 1. What is meant by refractive index of a medium?
2. The absolute refractive index of water is $\frac{4}{3}$ and that of glass is $\frac{3}{2}$. Calculate the refractive index of glass with respect to water (μ_{wg}). [3]
- (b) 1. State the two conditions required for Total Internal Reflection (TIR) to occur.
2. Draw a ray diagram to show total internal reflection of light inside a 45° - 90° - 45° right-angled isosceles prism used to deviate a ray of light through 180° . [3]
- (c) Define the term lateral displacement. State two factors on which lateral displacement produced by a rectangular glass block depends. [4]

Question 7

- (a) An object of height 4 cm is placed at a distance of 20 cm in front of a convex lens of focal length 10 cm.
1. Calculate the position of the image (v).
2. Calculate the height of the image formed (h_i).
3. State two characteristics of the image. [3]
- (b) 1. What is meant by spectrum of white light?
2. Name the color of white light that undergoes:
• Maximum deviation when passing through a prism.
• Minimum deviation when passing through a prism. [3]
- (c) 1. Complete the ray diagram below showing the image formation for a concave lens when an object is placed between infinity and the optical center (O).
2. Mention two distinct uses of a convex lens. [4]



Question 8

- (a) 1. Arrange the following electromagnetic waves in increasing order of their frequency:
Radio waves, X-rays, Infrared rays, Visible light.
2. Name the electromagnetic radiation used in:
• Detecting fake currency notes
• Radar communication [3]
- (b) 1. Explain why the sun appears reddish during sunrise and sunset.
2. Which color of white light scatters the most in Earth's atmosphere and why? [3]
- (c) 1. Differentiate between real and virtual images (two points of difference).
2. A lens has a power of -2.5 D. Find its focal length and identify the nature of the lens. [4]

MATHEMATICS - Sample Question Paper

Class: IX (ICSE Board Pattern) Maximum Marks: 80 Time Allowed: 2.5 Hours

General Instructions:

1. This paper is divided into two sections: **Section A** and **Section B**.
2. **Section A (40 Marks)** is compulsory. Attempt all questions from this section.
3. **Section B (40 Marks)** contains 7 questions. You are required to attempt **any four** questions from this section.
4. All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.
5. Omission of essential working will result in loss of marks.

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question 1 Choose the correct answers to the questions from the given options. [$15 \times 1 = 15$]

(i) The rationalizing factor of $\sqrt[3]{25}$ is:

(a) $\sqrt[3]{5}$

(b) 5

(c) $\sqrt{5}$

(d) $\sqrt[3]{25}$

(ii) The compound interest on Rs. 50,000 at 8% per annum for 1 year, compounded half-yearly is:

(a) Rs. 4,000

(b) Rs. 4,080

(c) Rs. 4,160

(d) Rs. 8,000

(iii) If $x^2 + \frac{1}{x^2} = 23$, then the value of $x + \frac{1}{x}$ (where $x > 0$) is:

(a) 5

(b) 25

(c) $\sqrt{21}$

(d) 21

(iv) The factors of $a^2 - b^2 - 2bc - c^2$ are:

(a) $(a + b - c)(a - b - c)$

(b) $(a - b + c)(a + b - c)$

(c) $(a + b + c)(a - b - c)$

(d) $(a + b + c)(a - b + c)$

(v) The simplified value of $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$ is:

(a) 0

(b) 1

(c) x

(d) x^{a+b+c}

(vi) If $\log_x 256 = 4$, then the value of x is:

(a) 2

(b) 4

(c) 8

(d) 16

(vii) If $\sin \theta = \cos \theta$ and $0^\circ \leq \theta \leq 90^\circ$, then the value of θ is:

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 90°

(viii) The value of $2 \sin^2 30^\circ - 3 \cos^2 45^\circ + \tan^2 60^\circ$ is:

- (a) 1
- (b) 2
- (c) 0
- (d) 1.5

(ix) The distance between the points $(a \cos \theta, 0)$ and $(0, a \sin \theta)$ is:

- (a) a
- (b) a^2
- (c) $2a$
- (d) 0

(x) In what ratio does the x-axis divide the line segment joining the points $A(2, -3)$ and $B(5, 6)$?

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

(xi) If $x = 2 - \sqrt{3}$, the value of $x^2 - 4x + 1$ is:

- (a) 1
- (b) 0
- (c) -1
- (d) $2\sqrt{3}$

(xii) What sum of money will amount to Rs. 13,230 in 2 years at 5% per annum compound interest?

- (a) Rs. 10,000
- (b) Rs. 12,000
- (c) Rs. 11,500
- (d) Rs. 12,500

(xiii) The expansion of $(2x - 3y)^3$ is:

- (a) $8x^3 - 27y^3 - 18xy(2x - 3y)$
- (b) $8x^3 - 27y^3 + 18xy(2x - 3y)$
- (c) $8x^3 + 27y^3 - 18xy(2x - 3y)$
- (d) $8x^3 - 27y^3 - 36x^2y - 54xy^2$

(xiv) If $\log 2 = 0.3010$ and $\log 3 = 0.4771$, the value of $\log 12$ is:

- (a) 0.7781
- (b) 1.0791
- (c) 1.7781
- (d) 0.9542

(xv) The midpoint of the line segment joining $(3a, 4)$ and $(-a, 2b)$ is $(2, 2a + 1)$. The values of a and b are:

(a) $a = 2, b = 3$

(b) $a = 1, b = 0$

(c) $a = 2, b = 1$

(d) $a = 2, b = 2$

Question 2

(i) A sum of money amounts to Rs. 9,680 in 2 years and Rs. 10,648 in 3 years at compound interest. Find the rate of interest and the principal sum. [4]

(ii) If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$. [4]

(iii) Find the coordinates of the point P which divides the line segment joining the points $A(4, -3)$ and $B(8, 5)$ internally in the ratio $3 : 1$. [4]

Question 3

(i) Solve for x : $2 \log_{10} x + 1 = \log_{10} 250$. [4]

(ii) Find the values of a and b if: $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$. [4]

(iii) Prove the following trigonometric identity:

$$\frac{\cos A}{1 - \tan A} + \frac{\sin A}{1 - \cot A} = \sin A + \cos A \quad [5]$$

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question 4

(a) Solve the system of exponential equations for x and y :

$$3^{x-1} \times 9^y = 27 \quad \text{and} \quad 2^x \times 4^{y+1} = 64 \quad . [3]$$

(b) The coordinates of the vertices of a triangle are $A(-1, 3)$, $B(1, -1)$, and $C(5, 1)$.
Find the length of the median drawn from the vertex A . [3]

(c) The difference between the simple interest and compound interest on a certain sum of money for 2 years at 10% per annum is Rs. 400. Find the sum. [4]

Question 5

(a) Factorize completely: $2x^3 - x^2 - 13x - 6$. [3]

(b) If $13 \sin \theta = 5$, evaluate: $\frac{5 \sin \theta - 2 \cos \theta}{\tan \theta}$. [3]

(c) Evaluate using properties of logarithms:

$$\frac{1}{\log_a(abc)} + \frac{1}{\log_b(abc)} + \frac{1}{\log_c(abc)} \quad . [4]$$

Question 6

(a) Simplify by rationalizing the denominators:

$$\frac{1}{\sqrt{5}+\sqrt{4}} + \frac{1}{\sqrt{6}+\sqrt{5}} + \frac{1}{\sqrt{7}+\sqrt{6}} + \frac{1}{\sqrt{8}+\sqrt{7}} + \frac{1}{\sqrt{9}+\sqrt{8}} \quad [3]$$

(b) If $a^2 + b^2 + c^2 = 90$ and $a + b + c = 16$, find the value of $ab + bc + ca$. [3]

(c) Evaluate without using trigonometric tables:

$$4 (\sin^4 30^\circ + \cos^4 60^\circ) - 3 (\cos^2 45^\circ - \sin^2 90^\circ) \quad . [4]$$

Question 7

(a) The value of a machine depreciates every year by 10% . If its present value is Rs. 38,880, what was its value 3 years ago? [3]

(b) Simplify: $\left(\frac{81}{16}\right)^{-3/4} \times \left[\left(\frac{25}{9}\right)^{-3/2} \div \left(\frac{5}{2}\right)^{-3}\right]$. [3]

(c) Show that the points $A(-3, 2)$, $B(-5, -5)$, $C(2, -3)$, and $D(4, 4)$ form a rhombus. [4]

Question 8

(a) Prove that: $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$. [3]

(b) If $\log_{10}\left(\frac{x-y}{3}\right) = \frac{1}{2}(\log_{10}x + \log_{10}y)$, prove that $x^2 + y^2 = 11xy$. [3]

(c) If $x - \frac{1}{x} = 4$, evaluate: (i) $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$. [4]

Question 9

(a) Find the values of p and q if the point $(p, 3)$ lies on the line segment joining the points $A(-4, 5)$ and $B(2, -1)$. Also, find the ratio in which the point divides AB . [3]

(b) In a right-angled triangle ABC , right-angled at B , if $\tan A = \frac{1}{\sqrt{3}}$, find the value of

$$\sin A \cos C + \cos A \sin C. [3]$$

(c) A man borrows Rs. 10,000 at 10% per annum compound interest. He repays Rs. 3,000 at the end of each year. Calculate the amount he must pay at the end of the third year to clear his debt. [4]

Question 10

(a) Expand using a suitable identity: $(2x - y + 3z)^2$. [3]

(b) Solve for x if: $x \sin 30^\circ \cos^2 45^\circ = \frac{\cot^2 30^\circ \sec 60^\circ \tan 45^\circ}{\operatorname{cosec}^2 45^\circ \operatorname{cosec} 30^\circ}$. **[3]**

(c) Solve the logarithmic equation: $\log_2(x^2 - 4) - \log_2(x - 2) = 3$. **[4]**