

2

Roll No.

Time : 3 hrs.]

[M.M. : 80

General Instructions :

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION-A

(Section A consists of 20 questions of 1 mark each.)

- Q1) Two lines $y = 3x + 5$ and $y = 3x + 10$ are | $y = 3x + 10$
- a) Intersecting b) Parallel
c) Perpendicular d) coincident
- Q2) A rational number in its lowest form has denominator $2^6 \times 5^7$. How many decimal places will its decimal expansion have?
- a) 4 b) 7 c) 13 d) 1
- Q3) What is the degree of a constant polynomial?
- a) 0 b) 1 c) 2 d) not defined
- Q4) The slope of the line represented by $4y = 8x - 12$ is:
- a) 8 b) -12 c) 2 d) -3

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(P.T.O.)

Q5) Which of the following is a rational number?

- a) π b) $\sqrt{5}$
 c) 0.101001000100001.... d) 0.835835835....

Q6) The area of an equilateral triangle having side length equal to 4cm is:

- a) $4\sqrt{3}$ cm² b) $\sqrt{3}$ cm² c) $16\sqrt{3}$ cm² d) $\frac{\sqrt{3}}{4}$ cm²

Q7) Which of the following cannot be the probability of an event?

- a) 15% b) 0.7 c) $\frac{2}{3}$ d) -1.5

Q8) What are the coordinates of the image of point (7,1), if reflected in y-axis?

- a) (1,7) b) (-1,7) c) (-7,1) d) (7, -1)

Q9) If $x-3$, 15, $x+9$ are consecutive terms of an AP, then x is

- a) 6 b) 9 c) 12 d) 15

Q10) Which of the following represents the triangular number sequence?

- a) 1, 2, 4, 8, 16, ... b) 1, 3, 6, 10, 15, ...
 c) 1, 4, 9, 16, 25, ... d) 2, 4, 6, 8, 10, ...

Q11) Which of the following is a factor of $(x+y)^3 - (x^3 + y^3)$?

- a) $x^2 + y^2 + 2xy$ b) $x^2 + y^2 - xy$
 c) xy^2 d) $3xy$

Q12) **Assertion(A):** If ordinate of a point is positive then the point lies above the x-axis.

Reason(R): If ordinate of a point is -2 and the abscissa of the point is -3, the point lies in IV quadrant.

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

Q13) If a point is 4 units away from the origin along the x-axis, it can be:

- a) (4, 0) or (-4, 0) b) (0, 4) or (0, -4)
 c) (3, 3) or (-3, -3) d) (2, 2) or (-2, -2)

Q14) A bag contains 3 white, 4 red and 5 black balls. One ball is drawn at random. What is the probability that the ball drawn is neither black nor white.

- a) $\frac{1}{4}$ b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) $\frac{3}{4}$

Q15) If a square has a side length of $(3x+2)$ units and another has $(3x-2)$ units, what is the difference in their areas?

- a) $24x$ b) 8 c) $12x$ d) 24

Q16) If a fair coin is tossed two times, then the probability of obtaining 'head' at least once is

- a) $\frac{1}{4}$ b) $\frac{2}{4}$ c) $\frac{3}{4}$ d) $\frac{4}{4}$

Q17) $(a+1)(a-1)(a^2+1) =$

- a) $a^4 - 2a^2 - 1$ b) $a^4 - a^2 - 1$
 c) $a^4 - 1$ d) $a^4 + 1$

Q18) The area of a ΔABC , in which $AB=AC=4$ cm and $\angle A=90^\circ$ is

- a) 16 cm² b) 8 cm² c) 4 cm² d) 32 cm²

Q19) **Assertion(A):** The decimal representation of $\frac{3}{8}$ is terminating.

Reason (R): If the denominator of a rational number in its simplest form is of the form $2^m \times 5^n$, where m, n are non-negative integers, then its decimal representation is terminating.

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

(4)

Q20) If the circumference and the area of a circle are numerically equal, then the diameter of the circle is

- a) $\frac{\pi}{2}$ units b) 2π units c) 2 units d) 4 units

SECTION-B

(Section B consists of 5 questions of 2 marks each.)

Q21) A die is thrown 100 times with the following frequencies for outcomes 1, 2, 3, 4, 5, and 6.

Outcome	1	2	3	4	5	6
Frequency	23	10	14	19	16	18

Find the probability of getting

- a) a prime number
b) neither prime nor even number

Q22)(A) A school plants 150 saplings in the first section of its garden. Each successive section has 20 more saplings than the previous one. Which section contains 690 saplings?

OR

Q22)(B) How many 3-digit numbers are multiples of 8?

Q23)(A) A cylindrical tank initially holds 1200 litres of water. Water is used at 40 litres per hour. After how many hours will the tank be exactly half full?

OR

Q23 (B) For the first 6 units of electricity, the bill is ₹90. For every additional unit, the charge is ₹ 12 per unit. Taking total units consumed as x and total bill as ₹ y , write a linear equation and calculate the bill for 126 units consumed.

Q24) A delivery driver earns a fixed daily wage of ₹850 plus ₹18 per parcel delivered.

- (i) Write a linear expression for earnings (E) when (d) parcels are delivered.
(ii) How much money will he earn after delivering 50 parcels?

(5)

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Q25) Find the value(s) of 'y' such that the distance between (2, -3) and (10, y) is 10 units.

SECTION-C

(Section C consists of 6 questions of 3 marks each.)

Q26) Simplify : $\frac{s^2 - 7s + 12}{5s^2 + 5s - 100}$ (denominator $\neq 0$)

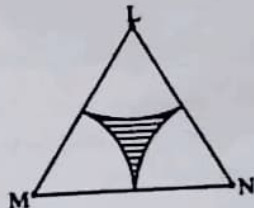
Q27) If 4th and 8th terms of GP are 24 and 384 respectively, then find out the first term and common ratio.

Q28) (A) The minute hand of a clock is 12cm long. Find the area of the face of the clock described by the minute hand in 35 minutes.

OR

Q28(B) An equilateral triangle $\triangle LMN$ has each of its sides 14cm. With each of its vertices as centres and radius 7cm, arcs are drawn as shown in the figure. Find

the area of the shaded region. (Take $\pi = \frac{22}{7}$, $\sqrt{3} = 1.73$)



Q29) If $a^2 + b^2 + c^2 = 16$ and $ab + bc + ac = 10$, find the value of $a + b + c$.

Q30) (A) Represent $\sqrt{8}$ on the number line.

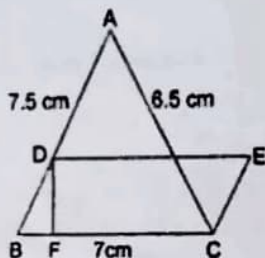
OR

Q30)(B) Prove that $\sqrt{5}$ is irrational.

$\frac{23}{100}$

(6)

- Q31) In the given figure, $\triangle ABC$ has sides $AB = 7.5$ cm, $AC = 6.5$ cm and $BC = 7$ cm. On base BC , a parallelogram $DBCE$ of the same area as that of $\triangle ABC$ is constructed. Find the height DF of the parallelogram.



SECTION-D

(Section D consists of 4 questions of 5 marks each.)

- Q32) (i) Write one rational and one irrational number between $\frac{2}{3}$ and $\frac{3}{4}$ (2)

- (ii) Express $0.\overline{27} + 0.\overline{38}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. (3)

- Q33)(A) The path of a train A is given by the equation $2x - 3y = 17$ and the path of another train B is given by the linear equation $4x - 6y = 18$.

- (i) Represent the above situations graphically on the same Cartesian plane. (4)
(ii) Write the slopes for each line. (1)

OR

- Q33)(B) The amount of water in two tanks is represented by the following linear equations:

Tank A: $W = 25t + 100$

Tank B: $W = 15t + 180$

(7)

where t represents time in minutes and W represents the amount of water in litres.

- (i) Represent the above situations graphically on the same Cartesian plane. (4)
(ii) From the graph, determine after how many minutes both tanks contain the same amount of water. (1)

- Q34)(A) Neha saves ₹150 in the first week. Every week, she increases her savings by ₹25.

- (i) Find the amount saved in the 18th week. (1)
(ii) In which week will she save ₹500? (1)
(iii) Find the difference between the savings in the 25th week and the 10th week. If Neha saves both these amounts together, how much money will she save? (3)

OR

- Q34)(B) A video receives 50 views on the first day. The number of views doubles every day.

- (i) Find the number of views on the 9th day. (1)
(ii) On which day will the number of views become 1,600? (1)
(iii) Find the increase in the number of views from the 6th day to the 9th day.

Also, determine how many times the views on the 9th day are compared to those on the 6th day. (3)

- Q35) (i) Factorise: $9a^3 - \frac{8}{3}b^3 + \frac{c^3}{3} + 6abc$ (3)

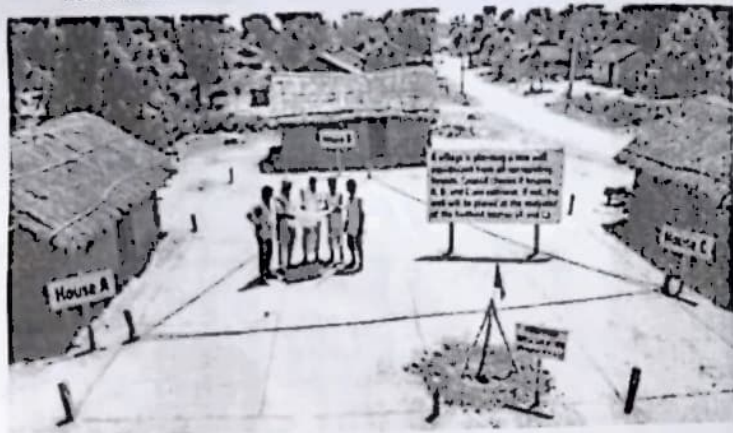
- (ii) Without finding the cubes, find the value of $(23)^3 + (-12)^3 + (-11)^3$. (2)

(8)

SECTION-E**(Section E consists of 3 CASE STUDY BASED questions of 4 marks each.)****Q36) Village Well Planning**

A village is planning to dig a new well at a central location so that all surrounding houses are equidistant from it. The houses are located at points A(2,3), B(8,3) and C(5,7) on a coordinate grid representing the village map.

The village council wants to check whether these three houses lie in a straight line so that the well can be placed equidistantly. If they are not collinear, the council wants to find the midpoint of the line segment joining the two farthest houses to locate the well.



Answer the following questions:

- Calculate the distance between House A and House B. (1)
- Calculate the distance between House B and House C. (1)
- (A) Check whether the points A (2,3), B (8,3) and C (5,7) are collinear. (2)

OR

- (B) Identify the two farthest houses and give coordinates of the well.

(9)

- Q37) A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat. Designs of some brooches are shown below. Observe them.

**A****B**

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28 mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch B is made in two colours: Gold and silver. The outer part is made with Gold. The circumference of the silver part is 44 mm and the gold part is 3 mm wide everywhere.

- Find the total length of silver wire required to make design A. (1)
- What is the area of each sector of the brooch in design A? (1)
- (A) Find the area of the golden part in the brooch in design B. (2)

OR

- (B) A boy is playing with brooch B. He makes a revolution with it along its edge. How many complete revolutions must it take to cover 80π mm?

- Q38) Priya surveyed her school of 160 students in Class 9. She asked two multiple-choice questions:



(10)

- (i) "How many hours do you study daily?"
- (ii) "What is your favourite subject?"

Each student selected only one option. The results are as shown:

STUDY HOURS	ENGLISH	MATH	SCIENCE	SOCIAL SCIENCE
Less than 1 hour	6	8	10	6
1-2 hours	12	14	16	10
2-3 hours	10	12	14	12
More than 3 hours	8	5	12	5

Answer the following questions:

- (i) If a student is randomly selected, what is the probability that the student studies more than 3 hours and prefers Science? (1)
- (ii) If a student is randomly selected, what is the probability that the student studies 1-2 hours and prefers Maths? (1)
- (iii) (A) If a student is randomly selected, what is the probability that the student studies 2-3 hours? (2)

OR

- (iii) (B) If a student is randomly selected, what is the probability that the student prefers English?