

Name : Roll No. Date :

SECTION - A [40 Marks]

(Attempt all questions from this section)

Q1- Choose the correct answer to the questions from the given options.

(Do not copy the questions write the correct answers only)

- i) The printed price of an article is Rs. 3080/-. If the rate of GST is 10%, then the GST charged is
 - (a) Rs. 154
 - (b) Rs. 308
 - (c) Rs. 30.80
 - (d) Rs. 15.40
- ii) A man deposited Rs. 1200 in a recurring deposit account for 1 year at 5% per annum simple interest. The interest earned by him on maturity is
 - (a) Rs. 14790
 - (b) Rs. 390
 - (c) Rs. 4680
 - (d) Rs. 780
- iii) The solution set for the linear inequation $-8 \leq x - 7 < -4, x \in I$ is
 - (a) $\{x : x \in R, -1 \leq x \leq 3\}$
 - (b) $\{0, 1, 2, 3\}$
 - (c) $\{-1, 0, 1, 2, 3\}$
 - (d) $\{-1, 0, 1, 2\}$
- iv) Which of the following quadratic equation has 2 and 3 as its roots?
 - (a) $x^2 - 5x + 6 = 0$
 - (b) $x^2 + 5x + 6 = 0$
 - (c) $x^2 - 5x - 6 = 0$
 - (d) $x^2 - 5x - 6 = 0$
- v) If x, y, z are in continued proportion, then $(y^2 + z^2) : (x^2 + y^2)$ is equal to
 - (a) $z : x$
 - (b) $x : z$
 - (c) zx
 - (d) $(y + z)(x + y)$
- vi) If a, b, c and d are proportional, then $\frac{a+b}{a-b}$ is equal to
 - (a) c/d
 - (b) $(c-d)/(c+d)$
 - (c) d/c
 - (d) $(c+d)/(c-d)$
- vii) If a polynomial $2x^2 - 7x - 1$ is divided by $(x + 3)$, then the remainder is
 - (a) -4
 - (b) 38
 - (c) -3
 - (d) 2
- viii) If $x-2$ is a factor of $x^3 + kx - 12$, then value of k is
 - (a) 3
 - (b) 2
 - (c) -2
 - (d) -3
- ix) If matrix A is of order 3×2 and matrix B is of order 2×2 then the matrix AB is of order.
 - (a) 3×2
 - (b) 3×1
 - (c) 2×3
 - (d) 1×3
- x) Which term of A.P. 3, 8, 13, 18 is 58?
 - (a) 12^{th}
 - (b) 13^{th}
 - (c) 16^{th}
 - (d) 10^{th}
- xi) The sixth term of GP 1, -3, 9, -27 is
 - (a) 243
 - (b) -243
 - (c) 242
 - (d) -240

- xii) The point (3,0) is invariant under reflection in
 (a) the origin (b) x-axis
 (c) y-axis (d) Both x and y axis
- xiii) Which of the following cannot be determined graphically for a grouped frequency distribution?
 (a) Median (b) Mode
 (c) Quartiles (d) Mean
- xiv) Assertion (A)

A die is thrown once and the probability of getting an even number is $\frac{2}{3}$

Reason (R)

The sample space for even numbers on a die is {2,4,6}

- (a) A is true but R is false (b) A is false but R is true
 (c) Both A and R are true (d) Both A and R are false
- xv) The roots of quadratic equation $ax^2 - bx + c = 0$ are real and equal if
 (a) $a^2 = 4bc$ (b) $b^2 = 4ac$
 (c) $-b^2 = 4ac$ (d) $a^2 = 4bc$

Q2- Solve the following :

- i) A shopkeeper buys a vacuum cleaner at a cost price of Rs.7000. He marks a price of Rs. 10000 on it and allows a discount of 10% on the marked price. How much does a customer pay for the vacuum cleaner if GST is charged at 18%? Find the net tax paid by the shopkeeper If the sale is intra state. (4)
- ii) Mr. Dutta has a recurring deposit account for 2 years at 8% simple interest p.a. She receives Rs. 1520/- as interest on maturity (4)
- (a) Find the monthly instalment
 (b) Find the maturity amount
- iii) If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$, prove that

$$\frac{a^2 + c^2 + e^2}{b^2 + d^2 + f^2} = \frac{ce}{df}$$

Q3.

(i) Let $A = \begin{bmatrix} 1 & 2 \\ -3 & a \end{bmatrix}$, $B = \begin{bmatrix} b & -3 \\ 5 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 3 \\ -4 & 2 \end{bmatrix}$

If $3A+B=C$ then find a and b

- (ii) If the sixth and eleventh terms of an AP are 60 and 80 respectively, find the sum of first ten terms.
- (iii) The marks obtained by 200 students in an examination of ICSE Board are given below.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of St.	5	10	11	20	27	38	40	29	14	6

Using a graph paper, draw an ogive for the above distribution. Use your ogive to estimate

- (i) The Median
 (ii) The lower quartile
 (iii) The number of students who obtained more than 80% marks.

SECTION B – [40 Marks]

[Attempt any four questions from this Section]

Q4

- (i) Solve the following inequation, write the solution set and represent it on the real number line. (3)

$$2x - \frac{5}{3} < \frac{3x}{5} + 10 \leq \frac{4x}{5} + 11; x \in \mathbb{R}$$

- (ii) The first term of an Arithmetic Progression (A.P.) is 5, the last term is 50 and their sum is 440.0
Find : (3)

- (a) the number of terms
(b) common difference

- (iii) 3, 9, m, 81 and n are in continued proportion. Find the values of m and n. (4)

Q5

- (i) Using properties of proportion, find the value of 'x': (3)

$$\frac{6x^2 + 3x - 5}{3x - 5} = \frac{9x^2 + 2x + 5}{2x + 5}; x \neq 0$$

- (ii) It is given that $(x - 2)$ is a factor of polynomial $2x^3 - 7x^2 + kx - 2$. Find: (3)

- (a) the value of 'k'.
(b) hence, factorise the resulting polynomial completely.

- (iii) Without solving the following quadratic equation, find the value of p for which the given equation has real and equal roots. (4)

$$x^2 + (p - 3)x + p = 0$$

Q6

- (i) Use a graph paper for this question taking 2 cm = 1 unit along both axes. (5)

- (a) Plot A(1, 3), B(1, 2) and C(3, 0).
(b) Reflect A and B on the x-axis and name their images as E and D respectively. Write down their coordinates.
(c) Reflect A and B through the origin and name their images as F and G respectively.
(d) Reflect A, B and C on the y-axis and name their images as J, I and H respectively.
(e) Join all the points A, B, C, D, E, F, G, H, I and J in order and name the closed figure so formed.

- (ii) Construct a regular hexagon of side 4 cm. Construct a circle circumscribing the hexagon. (5)

Q7

- (i) Use a graph paper for this question. (3)

(Take 2 cm = 10 Marks along one axis and 2 cm = 10 students along another axis).

Draw a Histogram for the following distribution which gives the marks obtained by 164 students in a particular class and hence find the Mode.

Marks	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Number of Students	10	26	40	54	34

- (ii) When divided by $x - 3$, the polynomials $x^3 - px^2 + x + 6$ and $2x^3 - x^2 - (p + 3)x - 6$ leave the same remainder. Find the value of p. (3)

- (iii) Refer to the given bill. (4)

A customer paid ₹2000 (rounded off to the nearest ₹10) to clear the bill.

Note: 5% discount is applicable on an article if 10 or more such articles are purchased.

BILL			
Article	M.P. (₹)	Quantity	G.S.T.
A	190	06	12%
B	50	12	18%

Check whether the total amount paid by the customer is correct or not. Justify your answer with necessary working.

Q8

- (i) If the sum of first n terms of an AP is given by $S_n = 6n + 7n^2$, then find the nth term of an AP. Also, find 10th term of an AP. (3)

- (ii) For the given frequency distribution, find the:

(3)

x	10	11	12	13	14	15	16
f	3	2	2	6	3	5	3

- (a) mean, to the nearest whole number
(b) median

- (iii) Mr. and Mrs. Das were travelling by car from Delhi to Kasauli for a holiday. Distance between Delhi and Kasauli is approximately 350 km (via NH 152D). Due to heavy rain they had to slow down. The average speed of the car was reduced by 20 km/hr and time of the journey increased by 2 hours. Find:

(4)

- (a) the original speed of the car.
(b) with the reduced speed, the number of hours they took to reach their destination.

Q9

- (i) A point P (a, b) is reflected in the Y-axis to P'(-3, 1). Write down the values of a and b. (3)
P'' is the image of P, when reflected in the X-axis. Write down the coordinates of P'' and P''' is the image of P, when reflected in the line x = 5. Write down the coordinates of P'''.
(ii) Ms. Sushmita went to a fair and participated in a game. The game consisted of a box having number cards with numbers from 01 to 30. The three prizes were as per the given table: (3)

Prize	Number on the card drawn at random is a
Wall Clock	perfect square
Purse	even number which is also a multiple of 3
Water Bottle	prime number

Find the probability of winning a:

- (a) Wall Clock
(b) Water Bottle
(c) Purse

- (iii) Given, $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix} M = 6I$, where M is a matrix and I is unit matrix of order 2×2 . (4)

- (a) State the order of matrix M.
(b) Find the matrix M.

Q10

- (i) If 1701 is the nth term of the Geometric Progression (G.P.) 7, 21, 63,....., find: (3)
(a) the value of 'n'
(b) hence find the sum of the 'n' terms of the G.P.
(ii) Each of the letters of the word 'AUTHORIZES' is written on identical circular disc and put in a bag. They are well shuffled. If a disc is drawn at random from the bag, what is the probability that the letter is (3)
(a) a vowel?
(b) one of the first 9 letters of the English alphabet which appears in the given word?
(c) one of the last 9 letters of the English alphabet which appears in the given word?

- (iii) A Mathematics aptitude test of 50 students was recorded as follows: (4)

Marks	50-60	60-70	70-80	80-90	90-100
Number of students	4	8	14	19	5

Draw a histogram for the above data using a graph paper and locate the mode.

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