STD: X
SUBJECT: MATHEMATICS

Time allowed : One and a half hours (inclusive of reading time)

All questions are compulsory

The intended marks for questions are given in brackets [ ]

Select the correct option for each of the following questions.

Section A [16 Marks] [16 X 1]

*

1 point

1. If the number of rows in a square matrix is $'n'$ then total number of elements in this matrix is

   a) n b) $2n$ c) n^2 d) $n+1$

- [ ] a
- [ ] b
- [x] c
- [ ] d

*

1 point

2. Solve for x : $-1 \leq 3+4x < 23, x \in N$

   a) $\{-1 \leq x < 5\}$ b) $\{1,2,3,4\}$ c) $\{-1,0,1,2,3,4\}$ d) $\{1,2,3,4,5\}$

- [ ] a
- [x] b
- [ ] c
- [ ] d

*

1 point

3. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then

a) $k < 4$ b) $k > 4$ c) $k \geq 4$ d) $k \leq 4$

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

1 point

4. If $(x - 2)$ is a factor of $x^2 - 7x + 2a$, find the value of a.

a) -5 b) 5 c) 7 d) -2

- [ ] a
- [x] b
- [ ] c
- [ ] d

*

1 point

5. The (n – 1)th term of an A.P. is given by 7,12,17, 22,... is

a) $5n + 2$ b) $5n + 3$ c) $5n - 5$ d) $5n - 3$

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

1 point

6. In calculations of Recurring Deposit Account, time is always taken in

a) days b) months c) years d) hours

- [ ] a
- [x] b
- [ ] c
- [ ] d

*

1 point

7. For an increasing A.P.

a) $d < 0$ b) $d > 0$ c) $d \leq 0$ d) $d \geq 0$

- [ ] a
- [x] b
- [ ] c
- [ ] d

*

1 point

8. Find the fourth proportional to 3 , 6 and 4.5

a) 9 b) 7 c) 10 d) 12

- [x] a
- [ ] b
- [ ] c
- [ ] d

*

1 point

9. The solution set of $2x - 5 \leq 5x + 4 < 11 , x \in Z$ is

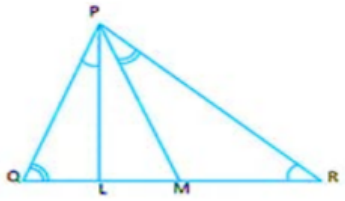
a) $\{-3, -2\}$ b) $\{0,1,2,3\}$ c) $\{-2, -1,0\}$ d) $\{-3, -2, -1,0,1\}$

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

1 point

10. In $\Delta PQR, L$ and M are the two points on the base QR, such that ∠ LPQ = ∠ QRP and ∠ RPM = ∠ RQP. Which triangle is similar to ΔPQL



a) ΔPLM b) ΔPQM c) ΔRLP d) ΔRPM

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

1 point

11. If $a:b = c:d$, then $a:c = b:d$, is according to _____property of proportion

a) Invertendo b) Alternendo c) Componendo d) Dividendo

- [ ] a
- [x] b
- [ ] c
- [ ] d

*

1 point

12. In Goods and Services Tax, Goods do not include

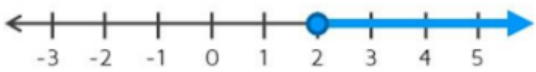
a) Money and property
b) Property and Securities
c) Money and securities
d) Money or securites

- ○ a
- ○ b
- ● c
- ○ d

*

1 point

13. Given $x \in R$. The solution set representing the following number line is :



a) $\{x : x \leq 2\}$ b) $\{x : x \geq 2\}$ c) $\{x : x < 2\}$ d) $\{x : x > 2\}$

- ○ a
- ● b
- ○ c
- ○ d

*

1 point

14. Find the quadratic equation , whose solution set is {3,5}

a) $x^2 - 8x + 15$ b) $x^2 - 8x - 15 = 0$ c) $x^2 + 8x + 15$ d) $x^2 - 8x + 15 = 0$

- ○ a
- ○ b
- ○ c
- ● d

*

1 point

15. In a unit matrix , each of the diagonal element is

a) 0 b) 2 c) 1 d) 3

- ○ a
- ○ b
- ● c
- ○ d

*

1 point

16. If $\frac{4a+5b}{4a-5b} = \frac{8}{7}$, then $a : b$ is

a) $75 : 4$ b) $4 : 75$ c) $2 : 70$ d) $70 : 2$

- [x] a
- [ ] b
- [ ] c
- [ ] d

*

2 points

Section B [12 Marks] **[6 X 2]**

17)Find the value of 'p', if the following quadratic equations have equal roots :

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

a) $p = -9$ b) $p = 1$ c) $p = -9 \text{ or } -1$ d) $p = 9 \text{ or } 1$

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

2 points

18)Find X if $Y = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ and $2X + Y = \begin{bmatrix} 1 & 0 \\ -3 & 2 \end{bmatrix}$

a) $X = \begin{bmatrix} -1 & -1 \\ -2 & -1 \end{bmatrix}$ b) $X = \begin{bmatrix} 10 & 1 \\ 2 & -1 \end{bmatrix}$ c) $X = \begin{bmatrix} 5 & -1 \\ 2 & -1 \end{bmatrix}$ d) $X = \begin{bmatrix} -2 & 4 \\ 1 & 3 \end{bmatrix}$

- [x] a
- [ ] b
- [ ] c
- [ ] d

*

2 points

19) If $\frac{x^2+y^2}{x^2-y^2} = 2\frac{1}{8}$, find $x:y$

a) 5:1 b) 1:3 c) 2:3 d) 5:3

- [ ] a
- [ ] b
- [ ] c
- [x] d

*

2 points

20)What number should be added to $3x^3 - 5x^2 + 6x$ so that when resulting polynomial is divided by $x - 3$, the remainder is 8?

a) -46 b) 14 c) 34 d) 46

- [x] a
- [ ] b
- [ ] c
- [ ] d

*

2 points

21)Mrs Goswami deposits ₹ 1,000 every month in a recurring deposit account for 3 years at the rate of 8% simple interest per annum. Find the interest.

a) ₹ 3,245 b) ₹ 4,440 c) ₹ 5,054 d) ₹ 1,150

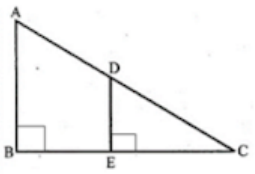
- [ ] a
- [x] b
- [ ] c
- [ ] d

*

2 points

22)In the given figure AB and DE are perpendicular to BC.

If $AB = 6\ cm$, $DE = 4\ cm$ and $AC = 15\ cm$, calculate CD



a) $7.5\ cm$ b) $18\ cm$ c) $10\ cm$ d) $12\ cm$

- [ ] a
- [ ] b
- [x] c
- [ ] d

*

4 points

Section C [12 Marks] **[4 X 3]**

23) A customer purchased following items from a store.

Sr no	Item	List price in ₹	Discount	GST
1	Cosmetics	500	10%	12%
2	Medicine	120		5%
3	Battery cells	250	5%	12%

i) Calculate the amount paid for the medicine (including GST)

a) ₹ 126 b) ₹ 120 c) ₹ 125 d) ₹ 114

ii) What is the price of battery cells after discount ?

a) ₹ 12.50 b) ₹ 262.50 c) ₹ 237.50 d) ₹ 250

iii) Total GST paid to the state government is

a) ₹ 100 b) ₹ 44.25 c) ₹ 88.50 d) ₹ 29

iv) Total amount of bill is

a) ₹ 870 b) ₹ 750 c) ₹ 896 d) ₹ 820

	a	b	c	d
i)	●	○	○	○
ii)	○	○	●	○
iii)	○	●	○	○
iv)	○	○	●	○

*

4 points

24)For the A.P. 1,7,13, ……..115

i) If 115 is n^{th} term, find the value of n.

a) 15 b) 20 c) 12 d) 10

ii) Find the 5th term of this A.P.

a) 22 b) 17 c) 25 d) 20

iii) Find the sum of this A.P.

a) 1160 b) 1150 c) 1100 d) 1120

iv) Find the 10th term from the end of this A.P.

a) 55 b) 61 c) 67 d) 73

	a	b	c	d
i)	○	●	○	○
ii)	○	○	●	○
iii)	●	○	○	○
iv)	○	●	○	○

*

4 points

25) A shopkeeper buys a certain number of books for ₹ 960. The original cost of each book is ₹ $'x'$.

i) How many books were bought by the shopkeeper?

a) $\frac{x}{960}$ b) $\frac{960}{x}$ c) x d) 960

ii) If the cost per book was ₹ 8 less, the number of books that could be bought for ₹ 960 would be 4 more. What will be the cost per book in this case.

a) ₹ $(x+4)$ b) ₹ $(960-x)$ c) ₹$(x-8)$ d) ₹ $(x+8)$

iii) The equation for the above problem is

a) $\frac{960}{x-8}-\frac{960}{x}=4$ b) $\frac{960}{x-8}+\frac{960}{x}=4$ c) $\frac{960}{x-8}-\frac{960}{x}=8$ d) $8-\frac{960}{x}=\frac{960}{x-8}$

iv) What is the original cost of each book ?

a) ₹ 48 b) ₹ 50 c) ₹ 20 d) ₹ 25

	a	b	c	d
i)	○	●	○	○
ii)	○	○	●	○
iii)	●	○	○	○
iv)	○	○	○	●

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