HALF YEARLY EXAMINATION

MATHEMATICS

CLASS 10

FULL MARKS : 40 TIME : 1Hour and half

SECTION A (16Marks)

1. A retailer bought an article from the dealer for Rs 580 and sold it to the customer for Rs 660. The rate of GST charged being 8%. Therefore the GST paid by the retailer to the State Government in rupees is
   A. 6.40
   B. 80
   C. 3.20
   D. 32
2. The smallest value for x in the given inequation $x - 3(2 + x) < 2(3x - 1)$; $x \in I$ is
   A. $-\frac{1}{2}$
   B. 0
   C. -1
   D. 1
3. Which of the following is not a quadratic equation :
   (i) $x^2 + 3x - 4 = 0$
   (ii) $4x^2 - 64 = 0$
   (iii) $3x^2 - 4x = 0$
   (iv) $x^3 - 2x + 4 = 0$

   A. (iv)
   B. (ii), (iii) , (iv)
   C. (ii)
   D. (iii)

4. The order of the matrix A $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$ is

   A. 1x 2
   B. 2 x 1
   C. Both A and B
   D. Neither A nor B

5. Using remainder theorem , the remainder on dividing $2x^3 - 3x^2 + 7x - 8$ by $(x - 1)$ is
   A. 2
   B. -1

C. 1
D. -2

6. Which of the following statement is true for two similar triangles :
   (i) They are never congruent
   (ii) They are always congruent
   (iii) May or may not be congruent.

   A. (i)
   B. (ii)
   C. (iii)
   D. (ii) and (iii)

7. Which of the following series are **not** in Arithmetic Progression :
   (i) $-40, -15, 10, 35$ .....
   (ii) $117, 104, 91, 78,$ .....
   (iii) $4, 8, 12, 16,$ .....

   A. (i)
   B. (ii)
   C. (iii)
   D. None of the above

8. If $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ then $3A - B$ is equal to
   A. $\begin{bmatrix} 8 & 7 \\ 6 & 2 \end{bmatrix}$
   B. $\begin{bmatrix} -8 & -7 \\ -6 & -2 \end{bmatrix}$
   C. $\begin{bmatrix} 4 & 17 \\ 12 & 10 \end{bmatrix}$
   D. $\begin{bmatrix} 8 & 6 \\ 7 & 2 \end{bmatrix}$

9. On solving the quadratic equation $x^2 - 8x + 16 = 0$ we get the value of ***x*** as :
   A. ± 4
   B. 4
   C. -4
   D. None of the above

10. If ΔABC is similar to ΔPQR, and AB = 6cm, PQ = 12cm, AC = 8cm, thenm the length of PR in centimetres is
   A. 4
   B. 16
   C. 12
   D. None of the above

11. If $2a, 3a + 2, 8a - 4$ are in Arithmetic Progression, then ***a*** is equal to

A. 3
B. −2
C. 2
D. 0

12. If 12 is the mean proportion between 6 and ***a***, then the value of ***a*** is
A. 24
B. 12
C. 8
D. None of the above

13. If (x − 2) is a factor of the expression $x^3 + 2x^2 - px + 10$, then the value of ***p*** is
A. 31
B. − 13
C. 13
D. 2

14. The sum of the first 8 terms of the Arithmetic Progression 10, 14, 18, 22.....
A. 48
B. 384
C. 96
D. 192

15. Mohan deposits Rs 100 per month in a recurring deposit account for one year at the rate of 6% per annum . The interest payable to him at the end of one year in rupees is
A. 12
B. 39
C. 42
D. 36

16. If 9, b, 4 are in continued proportion, then the value of ***b*** equals to
A. ±6
B. 36
C. 6
D. − 6

SECTION B (12 Marks)

17. The solution set for the following inequation $2x - 5 \leq 5x + 4 < 11$; $x \in W$, is

A. { −3, −2, −1, 0, 1}

B. { −2, −1, 0, 1}

C. { 0, 1 }

D. { 0, 1, 2 }

18. The range of values of ***p*** for which the quadratic equation $4x^2 + 12x + (p + 2) = 0$ has real roots is

A. $p < 7$

B. $p = 7$

C. $p > 7$

D. $p \leq 7$

19. Using remainder theorem, if $ax^3 + 3x^2 - 13x + 5$ is divided by $(x - 2)$, it leaves a remainder 7. Then the value of ***a*** is

A. 3

B. 2

C. -1

D. None of the above

20. The value of ***x*** from the matrix equation $\begin{bmatrix} x & 3x \\ 2 & 8 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} = \begin{bmatrix} 5 \\ 12 \end{bmatrix}$ is

A. 0

B. -1

C. 2

D. 1

21. If $\frac{x^2+y^2}{x^2-y^2} = \frac{17}{8}$ using properties of proportion, the value of x : y is

A. 5 : 3

B. 25 : 9

C. 3 : 5

D. None of the above

22. Rohit bought a washing machine at a discount of 10% on the marked price. Given that the marked price of the washing machine is Rs 16,000 and the rate of GST charged being 18%. The total price inclusive of GST paid by Rohit, in rupees, is

A. 16,892

B. 17,992

C. 16,992

D. 19,692

SECTION C (12 Marks)

23. The second term of an Arithmetic Progression is 14 and the 9^{th} term is 42.

(i) The common difference of the progression is

A. 3

B. -4

C. -3

D. 4

(ii) The first term of the progression is

A. 16
B. -10
C. 0
D. 10

(iii) The sum of 51 terms of the progression is

A. 5160
B. 5610
C. 5620
D. 4610

24. A train travels a distance of 300km at a constant speed of ***x*** km/h.

(i) the time taken by the train in hours is

A. $\frac{300}{x}$

B. $\frac{x}{300}$

C. 300x

D. None of the above

(ii) Due to emergency, the train increased the speed by 5 km/h. Hence, the time taken by the train with the increased speed is

A. $\frac{300}{x-5}$

B. $\frac{300}{x+5}$

C. $\frac{x+5}{300}$

D. $\frac{x-5}{300}$

iii) For the speed being increased, the train takes 2 hours less to cover the distance of 300km.On framing an equation in ***x*** and on solving the equation we get the value of ***x*** as

A. 25

B. 30

C. Both A and B

D. Neither A nor B

25. Let P = $\begin{bmatrix} 2 & 1 \\ 0 & -2 \end{bmatrix}$ and Q = $\begin{bmatrix} -3 & 2 \\ -1 & 4 \end{bmatrix}$

(i) the solution for matrix P^2 is

A. $\begin{bmatrix} 4 & 1 \\ 0 & 4 \end{bmatrix}$

B. $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$

C. $\begin{bmatrix} 0 & 4 \\ 4 & 0 \end{bmatrix}$

D. = $\begin{bmatrix} 4 & -1 \\ 0 & 4 \end{bmatrix}$

(ii) the solution for P^2 + PQ is

A. $\begin{bmatrix} -3 & 8 \\ 2 & -4 \end{bmatrix}$

B. $\begin{bmatrix} 3 & -8 \\ -2 & 4 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

D. None of the above