V I B G Y O R H I G H

SEMESTER 1 - MOCK PRELIMINARY EXAMINATION
AY 2021 – 2022
MATHEMATICS
Question Paper - cum – Answer Booklet

Grade: X **Max. Marks: 40**

Date: 15/11/2021 **Time Allowed: 1. 5hours**

Name of the Student:

Class & Division: **Unique ID:**

Signature of the Candidate:

INSTRUCTIONS:

- *All entries on the Question Paper-Cum-Answer Booklet must be made with Black/Blue ink pen ONLY.*
- *Candidates must clearly write their Unique ID (Unique Identification Number) on the top-sheet of the Question Paper-Cum-Answer Booklet in the space provided.*
- *On the top – sheet of the Question Paper - cum - Answer Booklet, candidates must put their signatures in the space provided for the purpose.*
- *Candidates are advised not to write or scribble anywhere else of the top-sheet of the Question Paper.*
- *In addition to the time indicated in the timetable for writing the paper, candidates will be given 10 minutes time for reading the questions.*
- *The marks intended for questions are given in brackets [].*
- *Select the correct option for each of the following questions.*
- *The selected choice of the answer must be clearly written in the space provided. Over writing of the answer must be avoided.*

- *Only one option indicating the selected answer should be written in the space given. More than one option, if written, will not be considered for evaluation.*
- *Rough work, if any, must be done in the sheets provided in this booklet for Rough Work. No separate sheet should be used for rough work.*
- *This Question Paper – cum – Answer Booklet should not be taken outside the Examination Hall / Room.*
- *If candidates complete their paper before the completion of the writing duration time, they must remain seated in the Hall / Room till the end of the examination..*

Maximum Marks: 40

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

ALL QUESTIONS ARE COMPULSORY.

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

Select the correct option for each of the following questions.

Section A [16 Marks] **[16x1=16]**

1. In Δ ABC, $\angle$ BAC is obtuse and AB = AC. P is a point in BC such that PC = 12 cm. PQ and PR are perpendiculars to sides AB and AC respectively. If PQ = 15 cm and PR = 9 cm; find the length of PB. **[1]**

   a) 20 CM
   b) 15 CM
   c) 10 CM
   d) 4 CM

   Answer: _____

2. Kiran purchases an article for ₹ 5310 which includes 10% rebate on the marked price and 18% tax (under GST) on the remaining price. Then the marked price of the article be, **[1]**

a) ₹ 6000

b) ₹ 4000

c) ₹ 8000

d) ₹ 5000

Answer: _____

3. If A, B, C, I are matrices of order 2 × 2. **[1]**

Which of the following is false?

a) A(BC) = (AB)C

b) A(B + C) = AB + AC

c) $(A - B)^2 = A^2 - 2AB + B^2$

d) AI = IA

Answer: _____

4. Find the fourth proportional to:1.5, 4.5 and 3.5 **[1]**

a) 10.2

b) 10.3

c) 10.4

d) 10.5

Answer: _____

5. In calculations of Recurring Deposit Account, time is always taken in _____. **[1]**

a) Days

b) Hours

c) Months

d) Years

Answer: _____

6. The solution of **[1]**

$$\frac{5x}{2} + \frac{3x}{4} \geq \frac{39}{4}$$

a) $x \geq 4$

b) $x \geq 2$

c) $x \geq 3$

d) $x \geq 0$

Answer: _____

7. If the sum of 3 consecutive numbers in an AP is 18 and their product is 192, then the numbers are **[1]**

a) 4, 6, 8

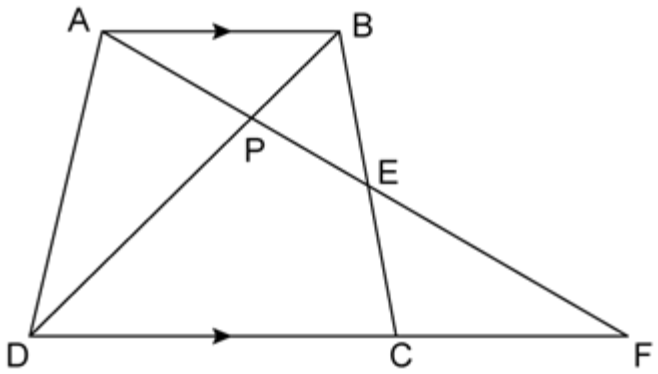
b) 3, 6, 9

c) 5, 6, 7

d) 4, 5, 9

Answer: _____

8. In the following figure, ABCD is a trapezium with AB ∥ DC. If AB = 9 cm, DC = 18 cm, CF= 13.5cm, AP = 6 cm and BE = 15 cm, Calculate: CE **[1]**



a) 21.5 cm

b) 23.5 cm

c) 22.5 cm

d) 20.5 cm

Answer: _____

9. Given x ϵ { Integers}, find the solution set of: $-5 \leq 2x - 3 < x + 2$ **[1]**

a) {-1, 0, 1, 2, 3, 4}

b) {-1, 0, 1, 2,}

c) {-1, 0, 1, 2, 3, 4,5}

d) {-2, -1, 0, 1, 2, 3, 4}

Answer: _____

10. $\sqrt{\frac{2}{3}}$ is a solution of equation $3x^2 + mx + 2 = 0$, **[1]**

find the value of m.

a) $2\sqrt{6}$

b) $\sqrt{6}$

c) $-2\sqrt{6}$

d) $2-\sqrt{6}$

Answer: _____

11. Mean proportion of $\frac{1}{3}$ and 108 is **[1]**

a) 36

b) 324

c) 9

d) 6

Answer: _____

12. What must be subtracted from $16x^3 - 8x^2 + 4x + 7$ so that the resulting expression has $2x + 1$ as a factor? **[1]**

a) 0

b) 1

c) 2

d) 3

Answer: _____

13. What is the common difference of an AP in which $a_{18} - a_{14} = 32$ **[1]**

a) 8

b) -8

c) -4

d) 4

Answer: _____

14. Which of the following is not a quadratic equation? **[1]**

a) $x^3 - 1 = (x^2 + 2)(x - 1)$

b) $\left(x - \frac{1}{x}\right) = 2$

c) $x^2 - 3x = 0$

d) $(x - 2)(x - 3) = x^2 + 5x - 9$

Answer: _____

15. The polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$, when divided by $(x - 4)$, leave the same remainder in each case. The value of a is. **[1]**

a) 0

b) 5

c) 1

d) 2

Answer: _____

16. If A = $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$, where I is unit matrix, then AI is equal to **[1]**

a) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

b) $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$

c) $\begin{bmatrix} 1 & 2 \\ 1 & 2 \end{bmatrix}$

d) $\begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$

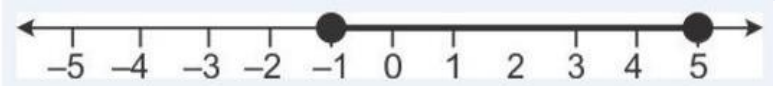
Answer: _____

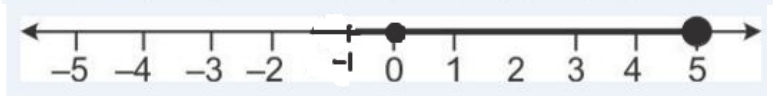
Section B [12 Marks]

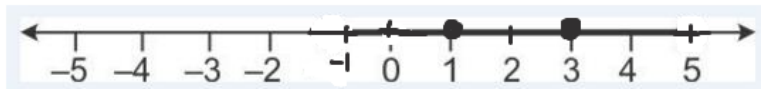
[6x2=12]

17. Given $x \in$ {real numbers}, find the range of values of x for which $-5 \leq 2x - 3 < x + 2$ and represent it on a number line. **[2]**

a) 

b) 

c) 

d) 

Answer: _____

18. Gopal has a cumulative deposit account and deposits₹ 900 per month for a period of 4 years he gets ₹52,020 at the time of maturity, The rate of interest is. **[2]**

a) 10%

b) 14%

c) 15%

d) 18%

Answer: _____

19. If $5x + 6y$**:** $8x + 5y = 8$**:** 9, find x **:**y. **[2]**

a) 13:19

b) 15:19

c) 14:19

d) 14:18

Answer: _____

20. A shopkeeper buys an article whose list price is ₹ 8000 at some rate of discount from a wholesaler. He sells the article to a consumer at the list price. The sales are intra-state and the rate of GST is 18%. If the shopkeeper pays a tax (under GST) of ₹72 to **[2]**

the State Government. Then the rate of discount at which he bought the article from the wholesaler ,

a) 5%

b) 10%

c) 15%

d) 20%

Answer: _____

21 Find x and y **[2]**

$$\begin{bmatrix} 5 & 2 \\ -1 & y-1 \end{bmatrix} - \begin{bmatrix} 1 & x-1 \\ 2 & -3 \end{bmatrix} = \begin{bmatrix} 4 & 7 \\ -3 & 2 \end{bmatrix}$$

a) x=4,y =2

b) x=4,y=0

c) $x = -4$,y =2

d) $x = -4$,y=0

Answer: _____

22. Find the number that must be added to the polynomial $3y^3 + y^2 - 22y + 15$, so that the resulting polynomial is completely divisible by (y + 3). **[2]**

a) 8

b) -9

c) 7

d) 6

Answer: _____

Section C [12 Marks] **[3X4=12]**

23. **[4X1=4]**

In an AP, first term is 3, last term is 83 and sum of the terms is 903.

i) Common difference of the AP is : **[1]**

a) 4

b) 5

c) 6

d) 7

Answer: _____

ii) Number of terms in the AP is : **[1]**

a) 15

b) 18

c) 20

d) 21

Answer: _____

iii) Second last term of the AP is : **[1]**

a) 78

b) 79

c) 80

d) 81

Answer: _____

iv) The sum of first 10 terms of the AP : **[1]**

a) 210

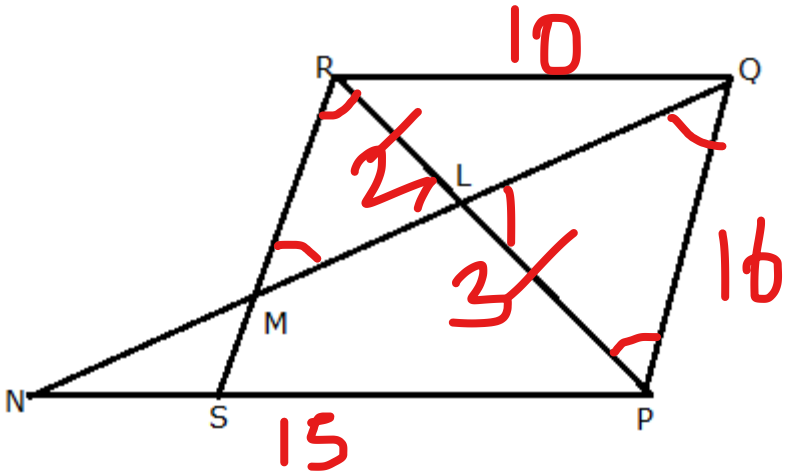
b) 410

c) 230

d) 430

Answer: _____

24. In the figure, PQRS is a parallelogram with PQ = 16 cm and QR = 10 cm. L is a point on PR such that RL**:** LP = 2**:** 3. QL produced meets RS at M and PS produced at N.



Using the given diagram answer the following questions:

i) Identify the similar triangle for ΔRLQ **[1]**

a) ΔPLN

b) ΔRLM

c) ΔPRS

d) ΔMSN

Answer: _____

ii) Find the value of PN **[1]**

a) 10CM

b) 12CM

c) 15CM

d) 20CM

Answer: _____

iii) Find the value of RM **[1]**

a) $10\frac{2}{3}$

b) $10\frac{4}{3}$

c) $10\frac{1}{3}$

d) $10\frac{5}{3}$

Answer: _____

iv) By which property the ΔRLM is similar to ΔPLQ? **[1]**

a) SAS

b) AA

c) SSS

d) None of the above

Answer: _____

25. ₹ 250 is divided equally among a certain number of children. If there were 25 children more, each would have received 50 paise less. Find the number of children.

i) Money received by each child is **[1]**

a) $\frac{250}{x}$

b) $\frac{x}{250}$

c) $20\ x$

d) $\frac{12}{x+20}$

Answer: _____

ii) If there were 25 children more, then Money received by each child is **[1]**

a) $\frac{250}{x}$

b) $\frac{250}{x+25}$

c) x-25

d) $25x$+250

Answer: _____

iii) The quadratic equation formed is **[1]**

a) $x^2 + 25x - 2880 = 0$

b) $x^2 - 80x - 2880 = 0$

c) $x^2 - 25x - 12500 = 0$

d) $x^2 + 25x - 12500 = 0$

Answer: _____

iv) The number of children. **[1]**

a) 100

b) 200

c) 50

d) 300

Answer: _____

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ROUGH WORK

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