

XII CLASS Mathematics Paper Model Paper Bihar Board

PARTS - A & B Max. Marks: 50

Time: 2 Hours

PART- A

Marks: 35

SECTION - I

Note: 1) Answer any FIVE of the following questions choosing at least two from each group A and B.

2) Each question carries TWO marks. $5 \times 2 = 10$

GROUP - A

(Geometry, Co-ordinate Geometry, Statistics)

1. Prove $\overline{(p \cap q)} = \overline{p} \cap \overline{q}$.
2. If $A \subset B$, then prove A is a subset of B than prove $(A \cup B) = B$.
3. If $f(x) = x + 2$, $g(x) = x - 3$, find $(f \circ g)^{-1}x$.
4. Solve $x^2 - 6x + 8 > 0$.

GROUP - B

(Linear Programming, Real Numbers, Progressions)

5. Draw the graph $2x + 3y = 6$.
6. Evaluate $\lim_{x \text{ tends to } a} \frac{(\sqrt{x+a} - \sqrt{2a})}{x-a}$
7. Solve $|(2x-1)/3| = 5$.
8. Insert four A.M.'s in between 3 and 23.

SECTION - II

Note: 1) Answer any FOUR of the following questions.

2) Each question carries ONE mark.

9. Show that $p \wedge p$ is a Tautology.
10. $f : \mathbb{R} \rightarrow \mathbb{R}$, If $f(x) = 3x + 5$ a bijection, find f^{-1} .

11. Define Remainders Theorem.
12. Find the value of objective function $P = (x/4) + (3y/20)$ at $(30, 150)$.
13. If $ax = b$, $by = c$, $cz = a$, show that $xyz = 1$. $ax = b$, $by = c$, $cz = a$,
14. are in G.P. then find the value of 'x'.

SECTION - III

Note: 1) Answer any FOUR of the following questions choosing at least two from each group A and B.

2) Each question carries FOUR marks.

GROUP - A

15. Prove that $A - (B \cap C) = (A - B) \cap (A - C)$ for any three sets A, B, C.
16. Let f, g, h be real functions defined as $f(x) = x$, $g(x) = 1-x$, $h(x) = x + 1$, then show that $h \circ (g \circ f) = (h \circ g) \circ f$
17. If $f(x) = x + 2$, $g(x) = x^2 - x - 2$ then find the value of $[g(1) + g(2) + g(3)] / [f(-4) + f(-2) + f(2)]$
18. Factorize $4x^3 - 12x^2 + 7x + 3x - 2$ by using Remainders theorem.

GROUP - B

19. A sweetshop makes gift packet of sweets combines two special types of sweets A and B which weight 7 kg. Atleast 3 kg of A and no more than 5 kg of B should be used. The shop makes a profit of Rs. 15 on A and Rs. 20 on B per kg. Determine the product mix so as to obtain maximum profit (write inequalities only).
20. If $y = 3$ then s.t. $3y^3 - 9y = 10.3$
21. The AM, GM, HM of two numbers are A, G, H respectively. Show that $A = G = H$.
22. If the sum of the first 'n' natural numbers is S and that of their cubes S_3 , show that $9S_3 = S(1 + 8S^2)$.

SECTION - IV

Note: 1) Answer any ONE of the follow
2) This question carries FIVE marks.

23. Draw the graph of $y = x^2 - 5x + 6$.

24. Maximise $f = 5x + 7y$ subject to the constraints $2x + 3y = 12$, $3x + y = 12$, $x = 0$, $y = 0$

PART - B
Marks: 15

Note: 1) Answer all the questions in the paper itself.
2) Each question carry 2 marks.

I. Choose the correct answer and write its letter in the brackets. ×

1. Converse of $p \wedge q$ is ()

- A) $\sim p \sim q$
- B) $\sim q \sim p$
- C) $p \wedge q$
- D) $q : p \wedge$

2. If $A = \{p, q, r, s\}$ then the number of subsets of A is ()

- A) 8
- B) 16
- C) 4
- D) 2

3. If $I(x) = x$ then I is function $I : A \rightarrow A, x \rightarrow x$ ()

- A) Inverse
- B) Identity
- C) Onto
- D) Constant

4. Number of elements in the range of Constant function ()

- A) 1
- B) 0
- C) 2
- D) Infinite

5. If $nC = nC$ then $n = 317$ ()

- A) 17
- B) 3

- C) 20
- D) 45

6. If $x = my$ ($m > 0$) Parabola lies in ()

- A) I & II
- B) I & III
- C) I & IV
- D) II & IV

7. Any such line parallel to the line represented by $f(x) = K$ is called ()

- A) Parallel lines
- B) Perpendicular lines
- C) Iso profit lines
- D) None

8. The value of 16 ()

- A) 32
- B) 64
- C) 16
- D) 54

9. The relation between AM, GM and HM is ()

- A) $A = GH$
- B) $G = AH$
- C) $H = AG$
- D) $AG = H$

II. Fill in the blanks with suitable answers.

11. $(p \vee q) = \dots\dots\dots$

12. If $n(A) = 4$, $n(B) = 5$, $n(A \cap B) = 2$ then $n(A \cup B) = \dots\dots\dots$

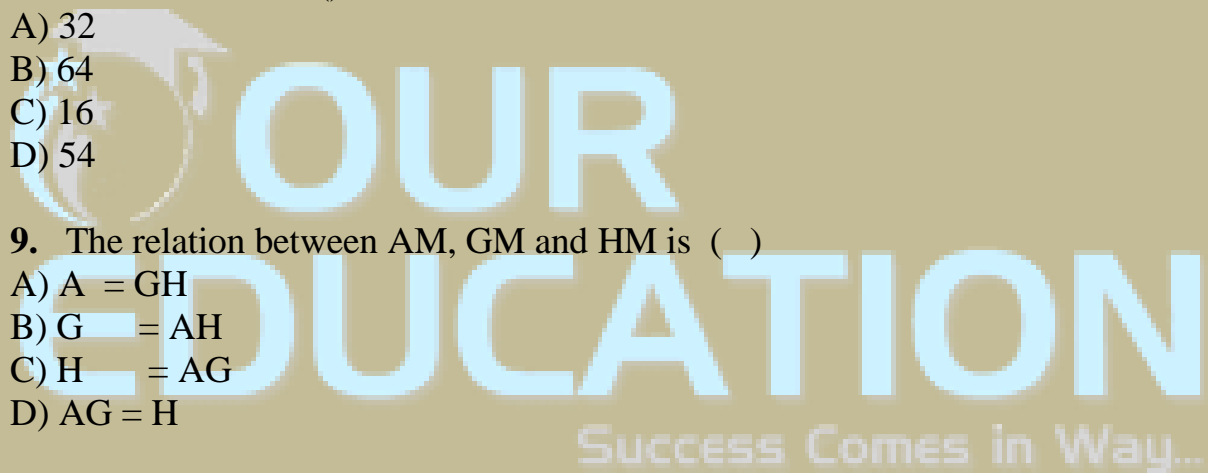
13. If a function is $\dots\dots\dots$ then only its inverse also a function.

14. If $n(A) = m$, $n(B) = n$ then number of relations from A to B is $\dots\dots\dots$

15. The last term in the expansion of $(x + 1)^n$ is $\dots\dots\dots$

16. If $(x - 2)^2$ is exactly divisible by $x^2 - 3x + 4x + k$ then $k = \dots\dots\dots$

17. Any point in the feasible region is called $\dots\dots\dots$



19. If 'n' G.M.'s in between a and b, then common ratio is

20. If K, K, K are in G.P. then a, b, c are in

III. Match the following.

(i) GROUP - A

GROUP - B

21. If $x < 0, y < 0$ then (x, y) lies in

[] A) (-1, 2)

22. A point in $x + 3y > 6$

[] B) 0

23. If $A = \{5, 6, 7\}, B = \{1, 2\}$ then $n(A \cap B) =$

[] C) 5

24. If $(x + y, 1) = (3, y - x)$ then $x =$

[] D) (1, 2)

25. Discriminant of $x^2 + 2x + 1 = 0$ is

[] E) 1

F) 2

G) Q

H) Q

(ii) GROUP -A

GROUP -B

26. If $3^x = 9$ then $x =$

[] I) 25

27. Find
(125)

[] J) 3^3

28. nth term of AP =

[] K) 15

29. $1 + x, 6, 9$ are in G.P. then $x =$

[] L) -15

30. A.M. of 5 and 25 is

[] M) -3

N) $a + (n - 1)d$

O) $10n$

P) $[2a + (1) d]$



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EDUCATION

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