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1036

2026

GENERAL MATHEMATICS

Full Marks : 90
Pass Marks : 27

Time : 3 hours

For convenience of the Candidates, all the questions in a particular medium is printed continuously in the order of English, Assamese, Bengali, Bodo and Hindi respectively so that candidate can access to the questions in the medium of their choice. In case of any discrepancy or confusion in the medium/version, the English Version will be considered as authentic version.

The figures in the margin indicate full marks for the questions.

Unless stated otherwise, use $\pi = \frac{22}{7}$.

অন্য ধৰণে দিয়া নাথাকিলে $\pi = \frac{22}{7}$ বুলি ধৰিবা।

অন্য ধৰনে দেওয়া না থাকিলে $\pi = \frac{22}{7}$ বলে ধরবে।

गुबुननै होनाय थायाब्ला $\pi = \frac{22}{7}$ हम।

यदि दिया गया न हो, $\pi = \frac{22}{7}$ मान का प्रयोग कीजिए।



SECTION - A

1 × 45 = 45

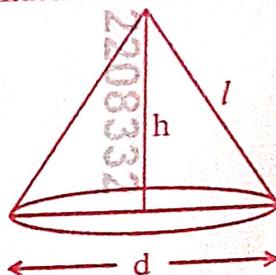
Choose the correct answer :

1. Assertion (A) : If the value of mode and mean is 60 and 66 respectively, then the value of median is 64.

Reason (R) : Median = $\frac{1}{3}$ (Mode + 2 Mean)

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of (A).
 (c) Assertion (A) is true, but Reason (R) is false.
 (d) Assertion (A) is false, but Reason (R) is true.

2. In the figure shown below, match the column I with column II.



where

- h → height
 l → slant height
 d → diameter

Column-I	Column-II
(i) Curved Surface Area (CSA) of a cone	(P) $\frac{\pi d^2}{4}$
(ii) Slant height (l)	(Q) $\frac{\pi dl}{2}$
(iii) Total Surface Area (TSA) of a cone	(R) $\frac{\sqrt{d^2 + 4h^2}}{2}$
(iv) Base area of a cone	(S) $\frac{\pi d(2l + d)}{4}$

Choose the correct option :

- (a) (i) → (P) (ii) → (Q) (iii) → (R) (iv) → (S)
 (b) (i) → (Q) (ii) → (P) (iii) → (S) (iv) → (R)
 (c) (i) → (Q) (ii) → (R) (iii) → (S) (iv) → (P)
 (d) (i) → (Q) (ii) → (S) (iii) → (R) (iv) → (P)

3. If the system of equations $kx - 5y = 2$, $6x + 2y = 7$ has no solution, then what is the value of k ?

- (a) -10
(c) -6

- (b) -5
(d) -15

4. If 4, x_1 , x_2 , x_3 , 28 are in AP, then the value of x_3 is

- (a) 20
(c) 22

- (b) 21
(d) 24

5. A chord of 8 cm is situated at a distance of 3 cm from the centre. The radius of the circle is

- (a) 3 cm
(c) 2 cm

- (b) 4 cm
(d) 5 cm

6. Consider the following pairs of linear equations :

- (i) $2x - 3y = 8$, $4x - 6y = 9$
(ii) $2x + 3y - 9 = 0$, $4x + 6y - 18 = 0$
(iii) $2x - 3y = 7$, $3x + 2y = 9$

Choose the correct alternatives :

- (a) (i), (ii) are consistent.
(c) only (i) is inconsistent.

- (b) (i), (iii) are consistent.
(d) only (iii) is consistent.

7. Match column A with column B.

Column A

Column B

- (P) $x^2 - x - 6 = 0$ (i) roots are real and equal.
(Q) $x^2 - 2x + 1 = 0$ (ii) roots are 3 and -2.
(R) $x^2 - x + 6 = 0$ (iii) roots are 2 and -3.
(S) $x^2 + x - 6 = 0$ (iv) roots are imaginary.

Choose the correct alternatives

- (a) P → (i), Q → (ii), R → (iii), S → (iv)
(b) P → (ii), Q → (i), R → (iv), S → (iii)
(c) P → (i), Q → (ii), R → (iv), S → (iii)
(d) P → (iii), Q → (iv), R → (ii), S → (i)

8. By which smallest number 3087 is to be multiplied, so that it becomes a perfect cube ?

- (a) 3
(c) 9

- (b) 7
(d) 21

9. Which of the following is not an irrational number ?

(a) $(2 - \sqrt{3})(\sqrt{2} + \sqrt{3})$

(b) $(\sqrt{2} - \sqrt{3})(\sqrt{2} + 3)$

(c) $(\sqrt{2} - \sqrt{3})(\sqrt{2} + \sqrt{3})$

(d) $\frac{2\sqrt{7}}{7}$

10. If α and β are zeroes of the polynomial $px^2 + qx + r$, then the value of $(1 + \alpha)(1 + \beta)$ is

(a) $\frac{p+q+r}{p}$

(b) $\frac{p-q-r}{p}$

(c) $\frac{p+q-r}{p}$

(d) $\frac{p-q+r}{p}$

11. If $\sin \theta + \cos \theta = \frac{4}{3}$, then the value of $\sin \theta \cdot \cos \theta$ is

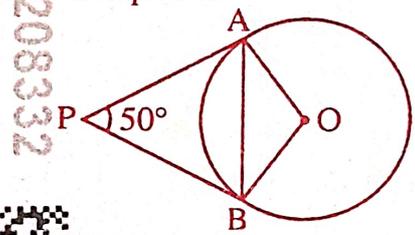
(a) 1

(b) $\frac{7}{9}$

(c) $\frac{7}{18}$

(d) 0

12. In the figure, if PA and PB are tangents to the circle with centre O such that $\angle APB = 50^\circ$, then $\angle OAB$ is equal to



(i) 25°

(ii) 75°

(iii) $90^\circ - 15^\circ$

(iv) $90^\circ - 65^\circ$

(a) (i), (iv)

(b) (ii), (iii)

(c) (ii), (iv)

(d) (i), (iii)

9

13. If in an arithmetic progression, the first term is 'a' and the common difference is 'p', then the n^{th} term is

(a) $\frac{n}{2} [2a + (p - 1)n]$

(b) $\frac{n}{2} [2a + (n - 1)p]$

(c) $a + (p - 1)n$

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

14. Which of the following statement is always true for similar triangles ?

(a) They have equal area.

(b) They have equal perimeter.

(c) Their corresponding angles are equal.

(d) Their corresponding sides are equal.

15. Mid-point of line segment joining $(2, -1)$ and $(6, 3)$ is

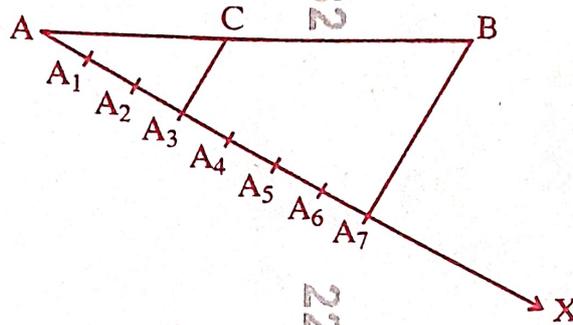
(a) $(4, 1)$

(b) $(2, 3)$

(c) $(5, 2)$

(d) $(3, 0)$

16. The median of first 8 prime numbers is
 (a) 7 (b) 9
 (c) 11 (d) 13
17. If for any event E, $P(E) = 0.11$ then $P(\bar{E})$ is equal to
 (a) 1.00 (b) 9.99
 (c) 0.89 (d) 1.11
18. In the figure, a line AB is divided in the ratio 3:4. Steps of construction will be as follows :



- (i) AX is drawn with acute angle $\angle BAX$ at a point A.
 (ii) A_3C is drawn parallel to A_7B which intersects AB at C.
 (iii) A_7B is joined.
 (iv) Locate 7 points $A_1, A_2, A_3, A_4, A_5, A_6, A_7$ such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5 = A_5A_6 = A_6A_7$.
 (v) The point C divides AB in the ratio 3:4.
 (vi) AB be a straight line.
- (a) (vi), (i), (iv), (iii), (ii), (v) (b) (vi), (i), (ii), (iii), (iv), (v)
 (c) (vi), (i), (iv), (ii), (iii), (v) (d) (vi), (i), (iii), (iv), (ii), (v)
19. The radius of a circle whose circumference is equal to the sum of the circumferences of two circles of radii 6 cm and 8 cm is
 (a) 10 cm (b) 96 cm
 (c) 2 cm (d) 14 cm
20. The volume and surface area of a sphere is numerically equal. The diameter of the sphere is
 (a) 3 units (b) 6 units
 (c) 2 units (d) 4 units
21. **Statement (A)** : All squares are similar.
Statement (B) : Two polygons of same number of sides are similar if their corresponding angles and corresponding sides are equal.

Choose the correct option :

- (a) (A) is true, but (B) is false. (b) (B) is true, but (A) is false.
 (c) Both (A) and (B) are false. (d) Both (A) and (B) are true.

22. The value of x which satisfies the equation $ax^2 + bx + c = 0$ (where $a \neq 0$) is given by

(a) $-\frac{b}{2a} \pm \frac{\sqrt{b^2 + 4ac}}{2a}$

(b) $-\frac{b}{2a} \pm \frac{\sqrt{b^2 + 4ac}}{2a}$

~~(c) $-\frac{b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$~~

(d) $-\frac{b}{a} \pm \frac{\sqrt{b^2 - 4ac}}{a}$

23. How many natural numbers are there, between n^2 and $(n + 1)^2$? W

~~(a) $2n$~~

(b) $2n - 1$

(c) $2n + 1$

(d) n

24. Statement (i) : $7 \times 2 + 3$ is a composite number.

Statement (ii) : Every composite number can be written as the product of powers of primes.

Choose the correct alternatives :

(a) Both (i) and (ii) are true.

(b) Both (i) and (ii) are false.

(c) (i) is true but (ii) is false.

~~(d) (i) is false but (ii) is true.~~

25. Assertion (A) : If sum of the zeroes of quadratic polynomial $3x^2 + kx + 5$ is $\frac{2}{3}$ then $k = -2$.

Reason (R) : Product of zeroes of the polynomial $ax^2 + bx + c$ is $\frac{c}{a}$.

Choose the correct option :

(a) Both Assertion (A) and Reason (R) are correct and (R) is the correct explanation of (A).

~~(b) Both Assertion (A) and Reason (R) are correct, but (R) is not the correct explanation of (A).~~

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.



26. Choose the correct option about the following two statements :

Statement (A): The value of $\tan A$ is always less than 1, where A is an acute angle.

Statement (B): $\sec A = \frac{12}{5}$ for some value of angle A .

~~(a) (A) is true, (B) is false.~~

(b) (A) is false, (B) is true.

(c) Both (A) and (B) are true.

(d) Both (A) and (B) are false.

27. Choose the correct option :

Statement (A): Infinite number of parallel tangents can be drawn in a circle.

Statement (B): If four sides of a quadrilateral ABCD are tangent to a circle, then $AB + CD = BC + AD$.

- (a) Both (A) and (B) are true. (b) (A) is true but (B) is false.
(c) (A) is false, but (B) is true. (d) Both (A) and (B) are false.

28. Two lines are given to be parallel. The equation of one of the lines is $2x - 3y = 5$. The equation of the second line can be

- (a) $4x - 3y = 10$ (b) $4x - 6y = 15$
(c) $2x - 6y = 5$ (d) $4x + 6y = 15$

29. The common difference and the next term of the AP $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}$ respectively are

- (a) $\sqrt{2}, \sqrt{46}$ (b) $\sqrt{2}, \sqrt{50}$
(c) $\sqrt{46}, \sqrt{2}$ (d) $\sqrt{50}, \sqrt{2}$

30. The co-ordinate of the point on x-axis which is equidistant from $(-4, 6)$ and $(8, -6)$ is

- (a) $(0, -2)$ (b) $(-2, 0)$
(c) $(2, 0)$ (d) $(4, 0)$

31. **Statement (A):** Two coins are tossed simultaneously. The probability of getting atleast one head is $\frac{1}{2}$.

Statement (B): One card is drawn randomly from a well-shuffled deck of 52 cards. The probability that the card drawn is a king is $\frac{1}{13}$.

- (a) (A) is true, (B) is false. (b) (A) is false, (B) is true.
(c) Both (A) and (B) are true. (d) Both (A) and (B) are false.

32. If one of the factors of $x^2 - y^2 + x + y$ is $(x + y)$, then the other factor is

- (a) $(1 + x - y)$ (b) $(1 - x + y)$
(c) $(x + y - 1)$ (d) $(x - y - 1)$

33. If θ is the angle of minor sector, then the area of the major sector is

- (i) $\left(\frac{360 - \theta}{720}\right) \times 2\pi r^2$ (ii) $\frac{\theta}{360} \times \pi r^2$
(iii) $\frac{360 - \theta}{360} \times 2\pi r$ (iv) $\frac{360 - \theta}{360} \times \pi r^2$

- (a) (i), (ii) (b) (i), (iii)
(c) (i), (iv) (d) (i), (ii), (iv)

34. The volume of two spheres are in the ratio 125:8, then the ratio of their surface area is –

- (a) 5:2 (b) 25:4
 (c) 25:2 (d) 5:4

35. The modal class in the given distribution table is

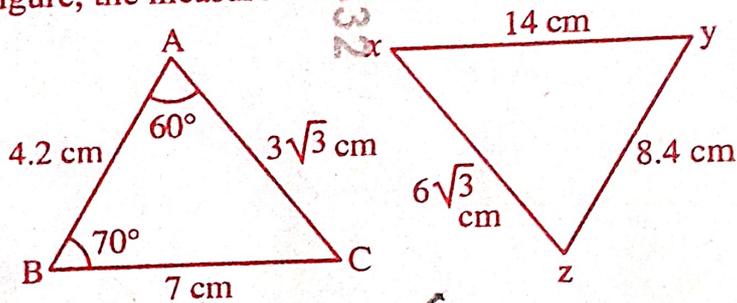
Class interval	10-25	25-40	40-55	55-70	70-85	85-100	Total
Frequency	4	3	7	8	6	2	30

- (a) 25-40 (b) 40-55
 (c) 55-70 (d) 70-85

36. Which of the following are in AP and having common difference 2 ?

- (a) $1^2, 3^2, 5^2, 7^2, \dots$ (b) $-6, -4, -2, 0, \dots$
 (c) $8, 6, 4, 2, \dots$ (d) $a, 2a, 4a, 6a, \dots$

37. In the given figure, the measure of $\angle x$ is



- (a) 60° (b) 50°
 (c) 70° (d) 80°

38. If two positive integers m and n are expressible in form $m = pq^3$ and $n = p^3q^2$, where p, q are prime numbers, then $L.C.M. (m, n) \times H.C.F. (m, n) =$

- (a) p^2q^3 (b) p^4q^5
 (c) p^3q^3 (d) pq^2

39. The zero of the linear polynomial $px - q$ will be

- (a) $-\frac{p}{q}$ (b) $-\frac{q}{p}$
 (c) $\frac{q}{p}$ (d) 0

40. Which of the following quadratic equations give real roots ?

(i) $x^2 - 2\sqrt{3}x + 9 = 0$

(ii) $3x^2 - 4\sqrt{3}x + 4 = 0$

(iii) $x^2 + x + 1 = 0$

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i) and (iii)

(d) Only (ii)



41. The circumference of a circle with radius 5 cm is ($\pi = 3.14$)

(a) 3.14 cm

(b) 15.7 cm

(c) 31.4 cm

(d) 78.5 cm

42. If $P(A)$ denotes the probability of an event A , then $P(A)$ is

(a) $P(A) < 0$

(b) $P(A) > 0$

(c) $-1 \leq P(A) \leq 1$

(d) $0 \leq P(A) \leq 1$

43. In a triangle the vertices are $A(0, 0)$, $B(6, 0)$ and $C(0, 8)$. Which option is correct after arranging the length of the sides in ascending order ?

(a) $CA < BC < AB$

(b) $BC < CA < AB$

(c) $AB < BC < CA$

(d) $AB < AC < BC$

44. If $\cot \theta = \frac{7}{8}$, then $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)} =$

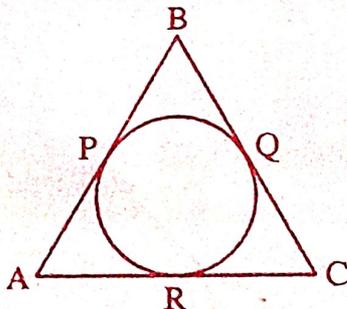
(a) $\frac{8}{\sqrt{113}}$

(b) $\frac{7}{\sqrt{113}}$

(c) $\frac{15}{64}$

(d) $\frac{49}{64}$

45. In the figure, if perimeter of $\triangle ABC$ is 27 cm, the value of $AP + BQ + CR$ is



(a) 7 cm

(b) 54 cm

(c) 13.5 cm

(d) 6.5 cm

SECTION - B

46. Find the smallest number by which 1620 should be divided to get a perfect square number. (2)

47. Find the H.C.F. of 96 and 404 using prime factorisation method. Hence find their L.C.M. by using this H.C.F. (2)

48. Prove that : (2)

$$(\operatorname{cosec} \theta - \cot \theta)^2 = \frac{\sec \theta - 1}{\sec \theta + 1}$$

49. Find the value of $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$ (2)



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50. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (2)

- (i) A face card
- (ii) A spade

51. If one zero of the polynomial $3x^3 - x^2 - 3x + 1$ is -1 , then find all the other zeroes. (3)

OR

Let $P(x) = x^3 - 5x^2 - 4x + k$ and let α , β and γ be its three zeroes. Then answer the following questions : (3)

- (i) Find the value of $\alpha + \beta + \gamma$.
- (ii) If $\alpha\beta\gamma = 7$, determine the value of k .
- (iii) For the obtained value k , verify whether $x = -2$ is a zero of $P(x)$.

52. The sum of a two digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. (3)

53. Find the roots of the following equation (3)

$$\frac{132}{x} - 1 = \frac{132}{x + 11}$$

54. PQRS is a trapezium with $PQ \parallel RS$. M and N are points on non-parallel sides PS and QR respectively such that $MN \parallel PQ$. Prove that $\frac{PM}{MS} = \frac{QN}{NR}$. (3)

55. Find the co-ordinate of a point P, which lies on the line segment joining the points A(-2, -2) and B(2, -4) such that $PB = \frac{2}{5} AB$. (3)

OR

The points P and Q trisect the line joining the points A(2, 1) and B(5, -8) such that the point P is nearer to the point A. If the point P lies on the line $2x - y + k = 0$, then find the value of k . (3)

56. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$. (3)

57. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the :

- (i) Length of the arc.
- (ii) Perimeter of the sector formed by the arc.
- (iii) Area of the sector formed by the arc.

1 + 1 + 1 = 3

58. An iron pillar has some part in the form of a right circular cylinder and the remaining part in the form of a right circular cone. The diameter of the base of each of the cone and the cylinder is 14 cm and the height of the conical part is 42 cm. If the total height of the pillar is 252 cm, find the volume of the pillar.

$(\pi = \frac{22}{7})$

3

OR

A cylindrical vessel of radius 8 cm contains water to a depth of 16.75 cm. If 20 spheres each of radius 3 cm are put into the vessel, then it will be completely filled with water. Find the height of the vessel.

3

59. From the following distribution, calculate the value of x and y , if $x + y = 20$ and median is 28.5. (15)

Class interval	Frequency
0 – 10	x
10 – 20	8
20 – 30	20
30 – 40	y
40 – 50	7
50 – 60	5
Total	60

60. Draw a triangle having sides 7 cm, 6 cm and 4 cm and then construct another triangle similar to it whose sides are $\frac{5}{3}$ times the corresponding sides of the first triangle. (3)

4

61. On the occasion of World Environment Day, a school undertook a tree plantation program in a garden near the school. They decided to plant the saplings in concentric circular rows such that each row has 10 more saplings than the previous one. If the first circular row has 20 saplings planted, answer the following questions :

- (i) Find the number of saplings in the 10th row. 200 1
- (ii) How many more saplings were there in the 6th row than in the 3rd row? 60 1
- (iii) If each student of the school plants one sapling and the total number of students is 900, then find how many rows will be there. 2