

Roll No..

Total No. of Questions : 40]

[Total No. of Printed Pages : 15

10thARNKD(W/Z) JKLUT-2025

1003-B

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 80

Note:- “Attempt any 68 Marks out of 80 Marks”.

SECTION-A

(1 mark each)

1. Which of the following represents an irrational number?

(a) $\frac{3}{7}$

(b) $0.333\ldots$

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

(d) None of these

10thARNKD(W/Z) JKLUT-25-1003-B

Turn Over

[2]

2. If $4x + 2 = 10 - 2y$, What is the value of y when $x = 0$?

(a) -4

(b) 4

(c) 5

(d) None of these

3. The Co-efficient of x^2 in the polynomial $5x^3 - 2x^2 + 3x - 4$ is

(a) 2

(b) -4

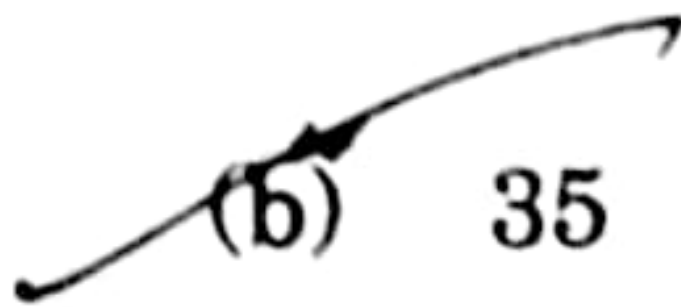
(c) -2

(d) None of these

Kashmir Student Alerts

4. Which of the following is the 5th term of the A.P : 7, 14, 21,?

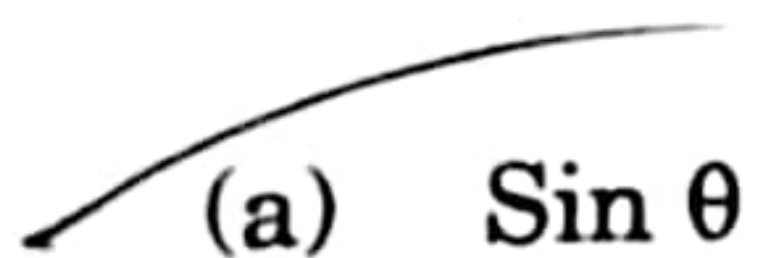
(a) 28

 (b) 35


(c) 53

(d) None of these

5. Which of the following is the ratio of adjacent side to the hypotenuse in a right triangle for acute angle θ .

 (a) $\sin \theta$

(b) $\sec \theta$

(c) $\tan \theta$ 

(d) None of these

7

6. The midpoint of the line segment joining $A(-2, 8)$ and $B(-6, -4)$ is

~~(a)~~ $(-4, 2)$

(b) $(4, 2)$

(c) $(-4, -6)$

(d) None of these

7. L.C.M of 6 and 72 is :

~~(a)~~ 72

(b) 6

(c) 12

(d) None of these

Kashmir Student Alerts

8. If $P(A) = 0.6$, then $P(\text{not } A)$ is

(a) 0.04

~~(b) 0.4~~

(c) 0.004

(d) None of these

9. Volume of hemisphere is

~~(a) $\frac{3}{2}\pi r^3$~~

~~(b) $\frac{2}{3}\pi r^3$~~

(c) $\frac{4}{3}\pi r^3$

(d) None of these

Kashmir Student Alerts

10. The roots of the quadratic equation $2x^2 - 5x + 3 = 0$ are

(a) 2, 3

(b) $1, \frac{2}{3}$

(c) $1, \frac{3}{2}$

(d) None of these

11. Prime factorization of 8190 is $2^3 \times 3^2 \times 5 \times 7$.

(True / False)

12. The common difference of A.P. $\frac{1}{2q}, \frac{1-2q}{2q}, \frac{1-4q}{2q}, \dots$ is

(a) 1

(b) -1

(c) $2q$

(d) None of these

13. For any event A associated to a random experiment, we have
 $0 \leq P(A) \leq 1$. (True / False)

14. Two figures having the same shape but not necessarily the same size
 are called _____ figures. (Congruent/Similar)

15. A circle may have _____ parallel tangents.

16. Write the first three terms of the sequence $a_n = (-1)^n \cdot 2^n$.
 (-2, 4, -8)

17. The pair of equations $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ are dependent
 equations. (True / False)

18. $\sec A = \frac{12}{5}$ for some value of angle A. (True / False)

Or

$$\sec^2 A = 1 + \tan^2 A \text{ for } 0^\circ \leq A < 90^\circ.$$

19. Calculate mean of first 5 prime numbers. 8.4
 5.6
20. Write the empirical relation between mean, mode and median.

Or

Write the formula for mode of Grouped data.

$3 \text{ median} + 2m$

$$1 + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$$

SECTION-B

(2 marks each)

21. The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them.

22. Find the roots of the quadratic equation $2x^2 + x - 300 = 0$ by factorisation.

23. 2 cubes each of volume 64cm^3 are joined end to end. Find the surface area of the resulting cuboid.

Or

Find the slant height of a Cone of radius = 2.5cm and height = 6cm.

24. Given that $\tan A = \frac{4}{3}$, find the other trigonometric ratios of angle A.

25. Find the point on the x - axis which is equidistant from (2, - 5) and (-2, 9).

Or

Find a relation between x and y such that the point (x, y) is equidistant from the points (3, 6) and (-3, 4).

26.

Find the zeroes of the polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients.

SECTION-C

(3 marks each)

27.

If A and B are $(-2, -2)$ and $(2, -4)$ respectively, find the co-ordinates of P such that $AP = \frac{3}{7} AB$ and P lies on the line segment AB.

28.

A chord of a circle of radius 12 cm subtends an angle of 120° at the centre. Find the area of the corresponding segment of the circle.

(use $\pi = 3.14$ and $\sqrt{3} = 1.73$). 740.

29.

Two concentric circles are of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle. 4

Or

PQ is a chord of length 8cm of a circle of radius 5cm. The tangents at P and Q intersect at a point T. Find the length TP.

30.

D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$.

Show that $CA^2 = CB \cdot CD$.

31.

If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Prove it.

32.

Prove that $3 + 2\sqrt{5}$ is irrational.

33.

How many terms of the A.P:

9, 17, 25, must be taken to give a sum of 636 ?

[12]

Or

How many three-digit numbers are divisible by 7 ?

34. A die is thrown once. Find the probability of getting.

(i) a prime number

(ii) a number lying between 2 and 6.

SECTION-D

(4 marks each)

35. Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. Find Rohan's present age.

[13]

Or

The altitude of a right triangle is 7cm less than its base. If the hypotenuse is 13cm, find the other two sides.

36.

A cubical block of side 7cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

Kashmir Student Alerts

A Gulab Jamun, contains sugar syrup upto about 30% of its volume. Find approximately how much syrup would be found in 45 Gulab Jamuns, each shaped like a cylinder with two hemispherical ends with length 5cm and diameter 2.8 cm.

37. From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20m high building are 45° and 60° respectively. Find the height of the tower.

38. Prove that $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$ using the identity $\sec^2 \theta = 1 + \tan^2 \theta$

Or

Write all the other trigonometric ratios of $\angle A$ in terms of $\sec A$.

39. A girl of height 90cm is walking away from the base of a lamp-post at a speed of 1.2m/s. If the lamp is 3.6m above the ground, find the length of her shadow after 4 seconds.

Or

If AD and PM are the medians of triangles ABC and PQR, respectively

where $\triangle ABC \sim \triangle PQR$, Prove that $\frac{AB}{PQ} = \frac{AD}{PM}$.

40.

The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	Number of Students
40-45	2
45-50	3
50-55	8
55-60	6
60-65	6
65-70	3
70-75	2
