EDUDEVS

Upskilling Education

CLASS - X
MATHEMATICS - BASIC
SET B

Section A

1 Mark Each

Section A consists of 20 questions of 1 mark each.

1. In an AP, if d = −4 , n = 7 and a_n = 4 , then a is equal to

(a) 6 **(b) 7**

(c) 20 **(d) 28**

2. A circle artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground, then the height of pole, if the angle made by the rope with the ground level is 30°, is

(a) 5 m **(b) 10 m**

(c) 15 m **(d) 20 m**

3. For finding the popular size of readymade garments, which central tendency is used?

(a) Mean **(b) Median**

(c) Mode **(d) Both Mean and Mode**

4. If x - 2y + k = 0 is a median of the triangle whose vertices are at points A(-1, 3), B(0, 4) and C (-5 , 2), then the value of k is

(a) 2 **(b) 4**

(c) 6 **(d) 8**

5.When a die is thrown, the probability of getting an odd number less than 3 is

(a) 1/6 **(b) 1/3**

(c) 1/2 **(d) 0**

6.The pair of linear equations 2kx + 5y = 7 , 6x -5y = 11 has a unique solution, if

(a) $k \neq -3$ (b) $k \neq \frac{2}{3}$

(c) $k \neq 5$ (d) $k \neq \frac{2}{9}$

7. The linear factors of the quadratic equation $x^2 + kx + 1=0$ are

(a) $k \geq 2$ (b) $k \leq 2$

(c) $k \geq -2$ (d) $2 \leq k \leq -2$

8. In a right angled ABC T right angled at B, if P and Q are points on the sides AB and BC respectively, then

(a) $AQ^2 + CP^2 = 2(AC^2 + PQ^2)$ (b) $2(AQ^2 + CP^2) = AC^2 + PQ^2$

(c) $AQ^2 + CP^2 = AC^2 + PQ^2$ (d) $AQ + CP = \frac{1}{2}(AC + PQ)$

9. A chord of a circle of radius 10 cm, subtends a right angle at its centre. The length of the chord (in cm) is

(a) $\frac{5}{\sqrt{2}}$ (b) $5\sqrt{2}$

(c) $10\sqrt{2}$ (d) $10\sqrt{3}$

10. If the point P (6, 2) divides the line segment joining A (6 ,5) and B (4, y) in the ratio 3 : 1 then the value of y is

(a) 4 **(b) 3**

(c) 2 **(d) 1**

11.The maximum number of zeroes a cubic polynomial can have, is

(a) 1 **(b) 4**

(c) 2 **(d) 3**

12. If the area of a semi-circular field is 15400 sq m, then perimeter of the field is

(a) 160 √2 m **(b) 260√ 2 m**

(c) 360 √2 m **(d)460 √2 m**

13. The 4th term from the end of an AP -11,- 8, -5, ..., 49 is

(a) 37 **(b) 40**

(c) 43 **(d) 58**

14. A fraction becomes 4 when 1 is added to both the numerator and denominator and it becomes 7 when 1 is subtracted from both the numerator and denominator. The numerator of the given fraction is

(a) 2 (b) 3

(c) 5 (d) 15

15. If △ ABC T is right angled at C, then the value of cos(A + B) is

(a) 0 (b) 1

(c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

16. Ratio of lateral surface areas of two cylinders with equal height is

(a) 1 : 2 (b) H : h

(c) R : r (d) None of these

17. The ratio in which the point (2 , y) divides the join of (-4 , 3) and (6, 3), hence the value of y is

(a) 2 : 3, y = 3 (b)3 : 2 ,y = 4

(c)3 : 2, y = 3 (d)3 : 2 ,y = 2

18.The sum of exponents of prime factors in the prime-factorisation of 196 is

(a) 3 (b) 4

(c) 5 (d) 2

19.Assertion : (2- √ 3) is one zero of the quadratic polynomial then other zero will be(2 + √ 3).

Reason : Irrational zeros (roots) always occurs in pairs.

(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 assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

20. Assertion : The equation $x^2 + 3x + 1 = (x-2)^2$ is a quadratic equation.

Reason : Any equation of the form $ax^2 + bx + c = 0$ where $a \neq 0$ is called a quadratic equation.

(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 assertion (A).

(c) Assertion (A) is true but reason (R) is false.

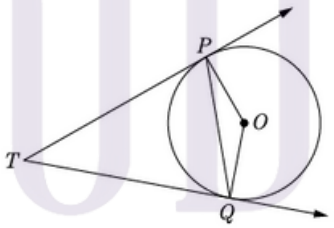
(d) Assertion (A) is false but reason (R) is true.

SECTION-B

Section B consists of 5 questions of 2 marks each.

21. In a rectangle ABCD, E is a point on AB such that AE = 2/3 AB. If AB = 6 km and AD = 3 km, then find DE.

22. In the given figure PQ is chord of length 6 cm of the circle of radius 6 cm. TP and TQ are tangents to the circle at points P and Q respectively. Find ∠PTQ.



23. Find the value of $\sin30°\cos 60° + \cos30°\sin60°$ is it equal to $\sin90°$ or $\cos90°$?

24. Find the mode of the following frequency distribution.

Class	0- 10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	10	10	16	12	6	7

or

The data regarding marks obtained by 48 students of a class in a class test is given below. Calculate the modal marks of students.

Marks obtained	0-5	5- 10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Number of students	1	0	2	0	0	10	25	7	2	1

25. Show that 571 is a prime number.

or

If two positive integers p and q are written as $p = a^2 b^3$ and $q = a^3 b$, where a and b are prime numbers than verify

LCM(p,q) × HCF(q,q) = pq

SECTION-C

Section C consists of 6 questions of 3 marks each.

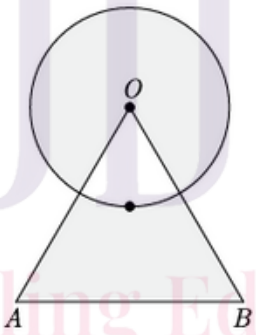
26.Find the middle term of the AP 7, 13, 19, ..., 247.

27. Prove that $(\sin\theta + \text{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

28. The circumference of a circle exceeds the diameter by 16.8 cm. Find the radius of the circle. Use $\pi = 22/7$.

or

Find the area of shaded region shown in the given figure where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.



29. The marks obtained by 110 students in an examination are given below

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Number of Students	14	16	28	23	18	8	3

Find the mean marks of the students.

30.If the point C (-1,2) divides internally the line segment joining the points A(2 , 5) and B(x , y) in the ratio 3 : 4 find the value of $x^2 + y^2$

or

Find the ratio in which the point (-3, p)divides the line segment joining the points (- 5 , -4) and (-2, 3). Hence find the value of p .

31. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and if it equal contain cartons of the same drink, what would be the greatest number of cartons each stack would have?

SECTION-D

Section D consists of 4 questions of 5 marks each.

32. Determine graphically whether the following pair of linear equations :

$3x - y = 7$
$2x + 5y + 1 = 0$ has :
unique solution
infinitely many solutions or
no solution.

OR

Solve the following pair of linear equations graphically:
$x + 3y = 12$, $2x - 3y = 12$
Also shade the region bounded by the line $2x-3y=2$ and both the co-ordinate axes.

33. ab and c are the sides of a right triangle, where c is the hypotenuse. A circle, of radius r, touches the sides of the triangle. Prove that

$$r = \frac{a+b-c}{2}.$$

34. A vertical tower stands on horizontal plane and is surmounted by a vertical flag-staff of height 6 m. At a point on the ground, angle of elevation of the bottom and top of the flag-staff are 30° and 45° respectively. Find the height of the tower. (Take $\sqrt{3} = 1.73$)

or

From the top of tower, 100 m high, a man observes two cars on the opposite sides of the tower with the angles of depression 30° and 45° respectively. Find the distance between the cars. (Use $\sqrt{3} = 1.73$)

35. The internal and external diameters of a hollow hemispherical vessel are 16 cm and 12 cm respectively. If the cost of painting 1 cm^2 of the surface area is Rs. 5.00, find the total cost of painting the vessel all over. use $\pi = 3.14$