MATHEMATICS BASIC 2020

SECTION - A

20 Marks

Question number 1 to 10 are multiple choice questions of 1 mark each. Select the correct option.

1. HCF of two numbers is 27 and their LCM is 162. If one of the number is 54 then the other number is:

(a) 36 (b) 35

(c) 9 (d) 81 1

2. The cumulative frequency table is useful in determining:

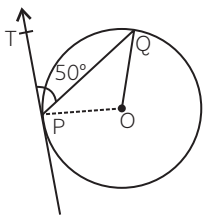
(a) Mean (b) Median

(c) Mode (d) All of these 1

3. In Figure, O is the centre of circle. PQ is a chord and PT is tangent at P which makes an angle of 50° with PQ. ∠POQ is:

(a) 130° (b) 90°

(c) 100° (d) 75°



1

4. $2\sqrt{3}$ is:

(a) an integer

(b) a rational umber

(c) an irrational number

(d) a whole number 1

5. Two coins are tossed simultaneously. The probability of getting at most one head is:

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$

(c) $\frac{2}{3}$ (d) $\frac{3}{4}$ 1

6. If one zero of the polynomial $(3x^2 + 8x + k)$ is the reciprocal of the other, then value of k is:

(a) 3 (b) –3

(c) $\frac{1}{3}$ (d) $-\frac{1}{3}$ 1

7. The decimal expansion of $\frac{23}{2^5 \times 5^2}$ will terminate after how many places of decimal?**

(a) 2 (b) 4

(c) 5 (d) 1 1

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

(a) 1 (b) 4

(c) 2 (d) 3 1

9. The distance of the (–12, 5) from the origin is:

(a) 12 (b) 5

(c) 13 (d) 169 1

10. If the centre of a circle is (3, 5) and end points of a diameter are (4, 7) and (2, y), then the value of y is:

(a) 3 (b) – 3

(c) 7 (d) 4 1

Question number 11 to 15, fill in the blanks.

11. The area of triangle formed with the origin and the points (4, 0) and (0, 6) is ..... .

OR

The co-ordinate of the point dividing the line segment joining the points A(1, 3) and B(4, 6) in the ratio 2 : 1 is 1

12. Value of the roots of the quadratic equation, $x^2 - x - 6 = 0$ are 1

13. If $\sin\theta = \frac{5}{13}$ then the value of $\tan\theta$ is 1

14. The value of $(\tan^2 60° + \sin^2 45°)$ is ..... .

1

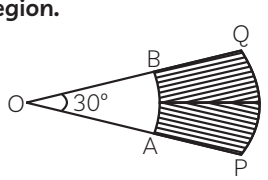
15. The corresponding sides of two similar triangles are in the ratio 3 : 4, then the ratios of the area of triangles is ..... .** 1

16. Find the value of (cos 48° – sin 42°).**

OR

Evaluate: (tan 23°) × (tan 67°)** 1

17. In fig., $\overset{\frown}{PQ}$ and $\overset{\frown}{AB}$ are two arcs of concentric circles of radii 7 cm and 3.5 cm resp., with centre O. If ∠POQ = 30°, then find the area of shaded region.



1

18. A card is drawn at random from a well shuffled deck of 52 playing cards. What is the probability of getting a black king? 1

19. A ladder 25 m long just reaches the top of a building 24 m high from the ground. What is the distance of the foot of ladder from the base of the building? 1

20. If $3k - 2$, $4k - 6$ and $k + 2$ are three consecutive terms of A.P., then find the value of k. 1

***Answer is not given due to change in latest syllabus*

SECTION - B

12 Marks

Question numbers 21 to 26 carry 2 marks each.

21. In a lottery, there are 10 prizes and 25 blanks. What is the probability of getting a prize? 2

22. In a family of three children, find the probability of having at least two boys.

OR

Two dice are tossed simultaneously. Find the probability of getting:

(A) an even number on both dice.

(B) the sum of two numbers more than 9. 2

23. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of larger circle which touches the smaller circle. 2

24. Prove that: $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\sec^2\theta$

OR

Prove that: $\frac{1-\tan^2\theta}{1+\tan^2\theta} = \cos^2\theta - \sin^2\theta$ 2

25. The wheel of a motorcycle is of radius 35 cm. How many revolutions are required to travel a distance of 11 m? 2

26. Divide $(2x^2 - x + 3)$ by $(2 - x)$ and write the quotient and the remainder.** 2

SECTION - C

24 Marks

Question numbers 27 to 34 carry 3 marks each.

27. If α and β are the zeroes of the polynomial $f(x) = 5x^2 - 7x + 1$, then find the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$. 3

28. Draw a line segment of length 7 cm and divide it in the ratio 2 : 3.**

OR

Draw a circle of radius 4 cm and construct the pair of tangents to the circle from an external point, which is at a distance of 7 cm from its centre.** 3

29. The minute hand of a clock is 21 cm long. Calculate the area swept by it and the distance travelled by its tip in 20 minutes. 3

30. If $x = 3\sin\theta + 4\cos\theta$ and $y = 3\cos\theta - 4\sin\theta$ then prove that $x^2 + y^2 = 25$.

OR

If $\sin\theta + \sin^2\theta = 1$; then prove that $\cos^2\theta + \cos^4\theta = 1$. 3

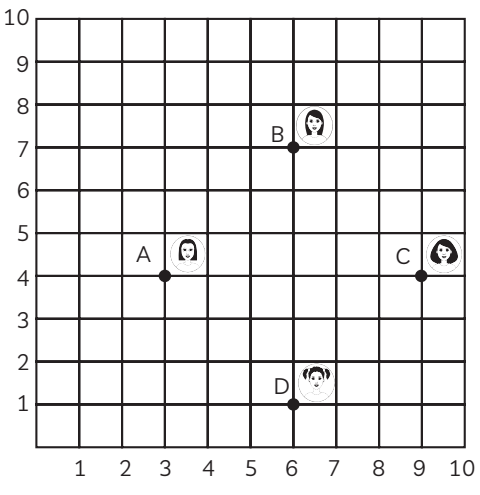
31. Prove that $\sqrt{3}$ is an irrational number.**

OR

Using Euclid's algorithm, find the HCF of 272 and 1032.** 3

32. In a rectangle ABCD, P is any interior point. Then prove that $PA^2 + PC^2 = PB^2 + PD^2$.** 3

33. In a classroom, 4 friends are seated at the points A, B, C and D as shown in Figure, Champa and Chameli walk into the class and after observing for a few minutes Champa asks Chameli, "Don't you think ABCD is a square?" Chameli disagrees. Using distance formula, find which of them is correct.



3

34. Solve graphically:

$2x - 3y + 13 = 0$; $3x - 2y + 12 = 0$ 3

SECTION - D

24 Marks

Question numbers 35 to 40 carry 4 marks each.

35. The product of two consecutive positive integers is 306. Find the integers. 4

36. The 17^{th} term of an A.P. is 5 more than twice its 8^{th} term. If 11^{th} term of A.P. is 43; then find its n^{th} term.

OR

How many terms of A.P. 3, 5, 7, 9, ... must be taken to get the sum 120? 4

37. A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on opposite bank is 60°. When he moves 30 m away from the bank, he finds the angle of elevation to be 30°. Find the height of the tree and width of the river. [Take $\sqrt{3} = 1.732$] 4

38. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.** 4

OR

Prove that the length of tangents drawn from an external point to a cricle are equal.**

39. From a solid cylinder whose height is 15 cm and the diameter is 16 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of remaining solid. (Give your answer in terms of π)** 4

OR

The height of a cone is 10 cm. The cone is divided into two parts using a plane parallel to its base at the middle of its height. Find the ratio of the volumes of the two parts.**

40. The mode of the following frequency distribution is 36. Find the missing frequency (f). 4

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