Sample Paper 10

Time : 90 Minutes **Max Marks : 40**

General Instructions

1. *The question paper contains three parts A, B and C.*
2. *Section A consists of 20 quesions of 1 mark each. Any 16 quesitons are to be attempted.*
3. *Section B consists of 20 quersions of 1 mark each. Any 16 quesions are to be attempted.*
4. *Section C consists of 10 quesions based two Case Studies. Attempt any 8 questions.*
5. *There is no negative marking.*

SECTION-A

Section A consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

1. Find a quadratic polynomial whose zeroes are 8 and 10.

(a) $k(x^2 + 10x + 80)$ (b) $k(x^2 - 2x + 1)$ (c) $k(x^2 - 18x + 80)$ (d) $k(x^2 + 6x + 9)$

2. What type of a triangle is formed with points (3, –3), (–3, 3) and $\left(-3\sqrt{3}, -3\sqrt{3}\right)$ as vertices?

(a) A scalene triangle (b) An equilateral triangle

(c) An isosceles triangle (d) A right triangle

3. The difference between two numbers is 26 and one number is three times the other. Find them.

(a) 39, 13 (b) 41, 67 (c) 96, 70 (d) 52, 26

4. A copper wire when bent in the form of an equilateral triangle has area $121\sqrt{3}\ \text{cm}^2$. If the same wire is bent into the form of a circle, find the area enclosed by the wire.

(a) 345.5 cm^2 (b) 346.5 cm^2 (c) 342.5 cm^2 (d) 340.25 cm^2

5. Three wheels can complete respectively 60, 36, 24 revolutions per minute. There is a red spot on each wheel that touches the ground at time zero. After how much time, all these spots will simultaneously touch the ground again?

(a) 3 second (b) 4 second (c) 5 second (d) 7 second

6. If , $\sin\theta = \dfrac{a^2 - b^2}{a^2 + b^2}$ then find cosec θ + cot θ.

(a) $\dfrac{a}{a+b}$ (b) $\dfrac{b+a}{b-a}$ (c) $\dfrac{a^2}{a+b}$ (d) $\dfrac{a+b}{a-b}$

7. The point which divides the line segment joining the points (7, –6) and (3, 4) in ratio 1 : 2 internally lies in the

(a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

8. An unbiased die is rolled twice. Find the probability of getting the sum of two numbers as a prime

(a) $\dfrac{3}{5}$ (b) $\dfrac{5}{12}$ (c) $\dfrac{7}{12}$ (c) $\dfrac{4}{5}$

9. Given $\Delta ABC \sim \Delta DEF$. If $AB = 2DE$ and area of ΔABC is 56 cm^2 find the area of ΔDEF.

(a) 14 sq.cm (b) 5 sq.cm (c) 18 sq.cm (d) 56 sq.cm

10. A sheet is 11 cm long and 2 cm wide. Circular pieces of diameter 0.5 cm are cut from it to prepare discs. Calculate the number of discs that can be prepared.

(a) 114 (b) 113 (c) 110 (d) 112

11. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$; x, y are prime numbers, then HCF (a, b) is

(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2

12. If $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=\frac{-k}{2}+\sec\theta\,\text{cosec}\,\theta$

Find the value of k.

(a) 1 (b) 0 (c) 3 (d) 2

13. Five years ago Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

(a) 50 yrs, 20 yrs (b) 40 yrs, 30 yrs (c) 60 yrs, 40 yrs (d) 45 yrs, 15 yrs

14. ABC is an isosceles triangle in which AB = AC = 10 cm. BC = 12 cm. PQRS is a rectangle inside the isosceles triangle. Given PQ = SR = y cm. and PS = QR = 2x cm. then x =

(a) $6-\frac{3y}{4}$ (b) $6 + 6y$ (c) $6+\frac{4y}{3}$ (d) $\frac{7x+8y}{4}$

15. If $f(x) = x^2 + 5x + p$ and $g(x) = x^2 + 3x + q$ have a common factor, then $(p - q)^2 =$ _____

(a) $2(5p - 3q)$ (b) $2(3p - 5q)$ (c) $3p - 5q$ (d) $5p - 3q$

16. A month is randomly selected from a year. An event X is defined as 'the month with 30 days'. Identify the number of outcomes of event X.

(a) 1 (b) 6 (c) 3 (d) 4

17. If $x^2=\frac{5}{9}$, then find whether the variable x is rational or irrational

(a) Rational (b) Irrational (c) Composite (d) Integer

18. If P = (2, 5), Q = (x, –7) and PQ = 13, what is the value of 'x'?

(a) 5 (b 3 (c) –3 (d) –5

19. In the figure, two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Then which of the following is true ?

(a) $PA.PB = PC^2$ (b) $PA.PB = PC.PD$ (c) $(PA)^2=\frac{PB.PB}{2}$ (d) $PC \times PC = PD$

20. If $\tan\theta=\frac{a\sin\phi}{1-a\cos\phi}$ and $\tan\phi=\frac{b\sin\theta}{1-b\cos\theta}$, then $\frac{a}{b}$ =

(a) $\frac{\sin\theta}{1-\cos\phi}$ (b) $\frac{\sin\theta}{1-\cos\phi}$ (c) $\frac{\sin\phi}{\sin\theta}$ (d) $\frac{\sin\theta}{\sin\phi}$

SECTION-B

Section B consists of 20 questions of 1 mark each. Any 16 quesions are to be attempted.

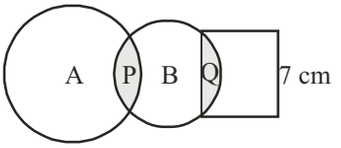
21. $x^n + y^n$ is divisible by $(x + y)$ when 'n' is _____

(a) an even number (b) an odd number (c) a prime number (d) a natural number

22. ΔABC is an isosceles triangle right angled at B. Similar triangles ACD and aBE are constructed on sides AC and AB. ratio between the areas of ΔABE and ΔACD is

(a) 1 : 4 (b) 2 : 1 (c) 1 : 2 (d) 4 : 3

23. in the given figure, a circle with centre B overlaps another circle with centre A and a square. The ratio of areas of P and Q is 5 : 4 and the area of Q is $\frac{1}{8}$ the area of circle B. The radii of circle A and circle B are 10 cm and 8 cm respectively.



Find the area of the unshaded part of the figure. (Take $\pi = 3.14$)

(a) 449.75 cm^2 (b) 520.60 cm^2 (c) 563.72 cm^2 (d) 507.44 cm^2

24. The set of real numbers does not satisfy the property of

(a) multiplicative inverse (b) additive inverse

(c) multiplicative identity (d) none of these

25. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0)is

(a) 5 (b) 12 (c) 11 (d) $7+\sqrt{5}$

26. Divide 62 into two parts such that fourth part of the first and two-fifth part of the second are in the ratio 2 : 3.

(a) 24, 38 (b) 32, 30 (c) 16, 46 (d) 40, 22

27. For the equations $(p + 2)\left(q-\frac{1}{2}\right) = pq - 5$ and $(p - 2)\left(q-\frac{1}{2}\right) = pq - 5$, find the solution set (p, q).

(a) $\left(-10,-\frac{1}{2}\right)$ (b) $\left(-10,\frac{1}{2}\right)$ (c) $\left(10,-\frac{1}{2}\right)$ (d) $\left(10,\frac{1}{2}\right)$

28. If $\cos\theta+\sqrt{3}\sin\theta = 2\sin\theta$

Then $\sin\theta-\sqrt{3}\cos\theta$

(a) $\cos\theta$ (b) $\sin\theta$ (c) $2\cos\theta$ (d) $2\sin\theta$

29. Which of the following is the quadratic polynomial whose zeros are $\frac{1}{3}$ and $\frac{-2}{5}$?

(a) $15x^2 + x - 2$ (b) $15x^2 + 5x - 6$ (c) $15x^2 - 5x + 6$ (d) $15x^2 - x + 2$

30. Two fair dice are thrown. Find the probability that both dice show different numbers.

(a) $\frac{1}{6}$ (b) $\frac{5}{6}$ (c) $\frac{32}{36}$ (d) $\frac{29}{36}$

31. The coordinates of the mid points of the line segment joining the points (3p, 4) and (–2, 2q) are (5, p). Then

(a) p = 4, q = 2 (b) q = 6, p = 2 (c) p + q = 8 (d) p – q = –2

32. The sum of a rational and an irrational number is _____.

(a) an irrational number (b) a rational number (c) an integer (d) a whole number

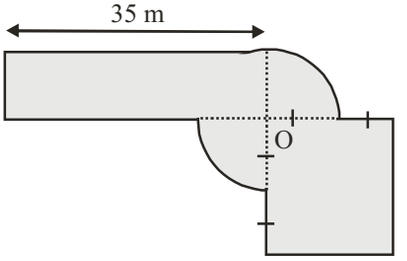
33. Solve for θ $\frac{\cos^2\theta}{\cot^2\theta-\cos^2\theta} = 3; (\theta < 90^\circ)$:

(a) 30° (b) 90° (c) 0° (d) 60°

34. Two poles of heights 6 metres and 11 metres stand vertically on a plane ground. If the distance between their feet is 12 metres, what will be the distance between their tops?

(a) 10 m (b) 12 m (c) 13 m (d) 15 m

35. In the given figure, O is the centre of the circle whose diameter is 14 cm.



Find the perimeter of the figure. (Use $\pi = \frac{22}{7}$)

(a) 134 cm

(b) 124 cm

(c) 112 cm

(d) 160 cm

36. Twice the product of the zeroes of the polynomial $23x^2 - 26x + 161$ is 14p. Then p is

(a) 3 (b) 1 (c) $\frac{5}{2}$ (d) (–1)

37. In what ratio does the point (–2, 3) divide the line–segment joining the points (–3, 5) and (4, –9) ?
(a) 2 : 3 (b) 1 : 6 (c) 6 : 1 (d) 2 : 1

38. The sum of three non-zero prime number is 100. One of them exceeds the other by 36. Find the largest number.
(a) 73 (b) 91 (c) 67 (d) 57

39. If $\Delta ABC \sim \Delta DEF$ such that BC = 2.1 cm and EF = 2.8 cm. If the area of triangle DEF is 16 cm^2, then the area of triangle ABC (in sq. cm) is
(a) 9 (b) 12 (c) 8 (d) 13

40. The value of k for which the system of equation $kx - y = 2$, $6x - 2y = 3$ has unique solution is
(a) not equal to one (b) equal to three (c) not equal to zero (d) not equal to three

SECTION-C

Case Study Based Questions:

Section C consists of 10 quesions of 1 mark each. Any 8 quesions are to be attempted.

Q 41. - Q 45 are based on case study-I

Case Study-I

Situation-1

H.C.F. × L.C.M. = Product of two integers.

41. The H.C.F. of two numbers is 16 and their product is 3072. Find their L.C.M.
(a) 182 (b) 121 (c) 192 (d) 3647

42. The sum of two numbers is 135 and their H.C.F. is 27. If their L.C.M. is 162, the numbers are
(a) 108, 27 (b) 72, 54 (c) 81, 54 (d) 99, 36

Situation-2

HCF of natural numbers is the largest factor which is common to all the number and LCM of natural numbers is the smallest natural number which is multiple of all the numbers.

43. If p and q are two co-prime natural numbers, then their HCF is equal to
(a) p (b) q (c) 1 (d) pq

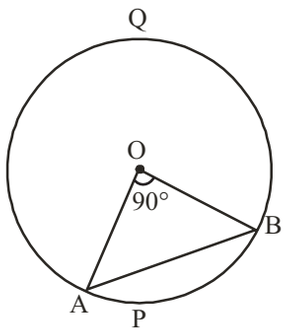
44. The LCM and HCF of two rational numbers are equal, then the numbers must be
(a) prime (b) co-prime (c) composite (d) equal

45. If two positive integers a and b are expressible in the form $a = pq^2$ and $b = p^3q$; p, q being prime number, then LCM (a, b) is
(a) pq (b) p^3q^3 (c) p^3q^2 (d) p^2q^2

Q 46 - Q 50 are based on case study-II

Case Study-II

A chord of a circle of radius 10 cm subtends a right angle at the centre.



46. The area of minor sector is
(a) 78 cm^2 (b) 79 cm^2
(c) 78.5 cm^2 (d) 77 cm^2

47. The area of minor segment is
(a) 28.5 cm^2 (b) 27 cm^2
(c) 26 cm^2 (d) 30 cm^2

48. The area of major sector is
(a) 236 cm^2 (b) 234 cm^2
(c) 237 cm^2 (d) 235.5 cm^2

49. The area of major segment is
(a) 285.5 cm^2 (b) 286 cm^2
(c) 287 cm^2 (d) 288 cm^2

50. The length of arc APB is
(a) 17.15 cm (b) 15.71 cm
(c) 25 cm (d) 15 cm