ACE OF PACE OBJECTIVE SECTION
(QUESTION PAPER)

1. If p_1 & p_2 are two odd prime numbers ($p_1 > p_2$), then $p_1^2 - p_2^2$ is

(A) Even (B) Odd (C) Prime (D) Cannot be Determined

2. The value of $\frac{\tan 65°}{\cot 25°} + \cot 1° \cot 2° \cot 3° \ldots\ldots\ldots \cot 90°$, is

(A) –2 (B) 2 (C) 1 (D) 0

3. If $x^2 + k(4x + k - 1) + 2 = 0$ has equal roots, then k =

(A) $\frac{-2}{3}$, 1 (B) $\frac{2}{3}$, –1 (C) $\frac{3}{2}, \frac{-1}{3}$ (D) $\frac{-3}{2}, \frac{1}{3}$

4. If four sides of quadrilateral ABCD are tangential to a circle then :

(A) AC + AD = BD + CD (B) AB + CD = BC + AD

(C) AB + CD = AC + BC (D) AB + BC + CD + AD =BD + AC

5. A number is selected from first 100 natural numbers. What is the probability that it is a multiple of 3 or 5?

(A) $\frac{1}{2}$ (B) $\frac{53}{100}$ (C) $\frac{47}{100}$ (D) $\frac{33}{100}$

6. If mean of first n natural numbers is $\frac{5n}{9}$, then n =

(A) 5 (B) 4 (C) 9 (D) 10

SPACE FOR ROUGH WORK

7. If $x = a\sec\theta\cos\phi$, $y = b\sec\theta\sin\phi$, $z = c\tan\theta$, then $\frac{x^2}{a^2} + \frac{y^2}{b^2} =$

(A) $\frac{z^2}{c^2}$ (B) $1-\frac{z^2}{c^2}$ (C) $\frac{z^2}{c^2}-1$ (D) $1+\frac{z^2}{c^2}$

8. For what value of 'k' will the system of equation will have infinite solution?
$2x+3y=5$ & $4x+ky=8$

(A) k = 6 (B) k = 3 (C) k = 10 (D) no value of k possible

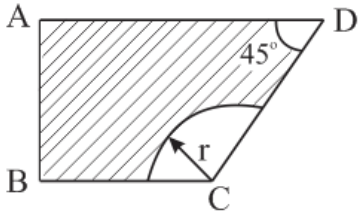
9. On walking x meters towards a chimney in a horizontal line through its base, elevation of its top changes from $30°$ to $60°$. The height of the chimney is :

(A) $3\sqrt{2}x$ (B) $2\sqrt{3}x$ (C) $\frac{\sqrt{3}}{2}x$ (D) $\frac{2}{\sqrt{3}}x$

10. In an equilateral triangle if $AD \perp BC$ (D lies on BC), then:

(A) $5AB^2 = 4AD^2$ (B) $3AB^2 = 4AD^2$ (C) $4AB^2 = 3AD^2$ (D) $2AB^2 = 3AD^2$

11. In given figure; find area of shaded regions AB = 5, BC = 10, r = 3 $\angle A = \angle B = 90°$



(A) $\frac{125}{2}-\frac{27\pi}{2}$ (B) $\frac{125}{2}-\frac{27\pi}{8}$ (C) $\frac{125}{4}-\frac{27\pi}{2}$ (D) None of these

SPACE FOR ROUGH WORK

12. If α, β, γ are roots of $f(x) = ax^3 + bx^2 + cx + d = 0$, then $\alpha^2 + \beta^2 + \gamma^2 =$

(A) $\frac{b^2 - ac}{a^2}$ (B) $\frac{b^2 - 2ac}{a}$ (C) $\frac{b^2 + 2ac}{b^2}$ (D) $\frac{b^2 - 2ac}{a^2}$

13. If sum of n term of an AP is $2n^2 + 5n$, then its n^{th} term is

(A) 4n – 3 (B) 3n – 4 (C) 4n + 3 (D) 3n + 4

14. If a + b + c = 0, & abc = 30, then find $a^3 + b^3 + c^3$.

(A) 1 (B) 10 (C) 90 (D) 3

15. A solid sphere of radius 'r' is melted and cast into the shape of a solid cone of height 'r', the radius of the base of cone is :

(A) 2 r (B) 3 r (C) r (D) 4 r

16. A man goes 15m due west & then 7m due north & then again 9m due west . How far is he from starting point?

(A) 31m (B) 17m (C) 25m (D) 26m

17. In a right triangle ABC, $\angle B = 90°, BC = 12 \& AB = 5$. The radius of the circle inscribed in the triangle is:

(A) 4 (B) 3 (C) 2 (D) 1

18. A father is three times as old as his son. In 12 years, he will be twice as old as his son. Find sum of their ages.

(A) 51 (B) 42 (C) 48 (D) 54

19. $\frac{5 + 9 + 13 + ...n\,terms}{7 + 9 + 11 + ...(n+1)\,terms} = \frac{17}{16}$, then n =

(A) 8 (B) 7 (C) 10 (D) 11

SPACE FOR ROUGH WORK

20. If a number x is chosen from 1, 2, 3 & a number y is taken from 1, 4, 9. Then probability $p(xy < 9)$ is:

(A) $\frac{7}{9}$ (B) $\frac{5}{9}$ (C) $\frac{2}{3}$ (D) $\frac{1}{9}$

21. A & B together can do a piece of work in 8 days. If A alone can do the same work in 12 days, then B alone can do the same work in how many days?

(A) 20 days (B) 16 days (C) 24 days (D) 28 days

22. If the perimeter of a semi – circular protractor is 36 cm , it diameter will be

(A) 10 cm (B) 12 cm (C) 14 cm (D) 16 cm

23. If $\sec 2A = \operatorname{cosec}(A - 42°)$, find A if 2A is acute.

(A) $48°$ (B) $44°$ (C) $42°$ (D) $46°$

24. If $\cos A + \cos^2 A = 1$, find $\sin^2 A + \sin^4 A$

(A) 1 (B) $\frac{1}{2}$ (C) 2 (D) $\frac{\sqrt{3}}{2}$

25. If $\sin\alpha$ and $\cos\alpha$ are roots of $ax^2 + bx + c = 0$, then $b^2 =$

(A) $a^2 + 2ac$ (B) $2a^2 + 2ac$ (C) $a^2 - ac$ (D) $a^2 + ac$

26. A takes 3 hours more than B to walk 30 km, But if A doubles his speed, he is ahead of B by $1\frac{1}{2}$ hours. Find $\frac{speed\ of\ A}{speed\ of\ B}$.

(A) $\frac{3}{2}$ (B) $\frac{2}{3}$ (C) 1 (D) None of these

SPACE FOR ROUGH WORK

27. If HCF & LCM of two numbers is pq^2 & p^3q^3 respectively, If first number, $N_1 = pq^3$. Find N_2

(A) p^3q^2 (B) p^2q^3 (C) p^2q^2 (D) pq^2

28. If $f(x) = ax^2 + bx + c$ has no real roots & $a + b + c < 0$, then

(A) c = 0 (B) c > 0 (C) c < 0 (D) cannot say

29. The ratio of lateral surface area to total surface area of a cylinder with base diameter 1.6 m & height 20 cm is:

(A) 1 : 7 (B) 1 : 5 (C) 7 : 1 (D) 5 : 1

30. If the centroid of the triangle formed by $(7,x),(y,-6)\&(9,10)$ is $(6,3)$, $(x,y) =$

(A) (4, 5) (B) (5, 4) (C) (–5, –2) (D) (5, 2)

31. A vessel is filled with liquid, 3 parts of which are water and 5 parts syrup. How much quantity of the mixture must be removed and replaced with water so that the mixture may contain half water & half syrup?

(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{5}$ (D) $\frac{1}{7}$

32. If one root of $x^2 + bx + c = 0$ is $(5 - \sqrt{2})$, when b ,c are rational then $c =$

(A) 21 (B) 1 (C) 23 (D) –1

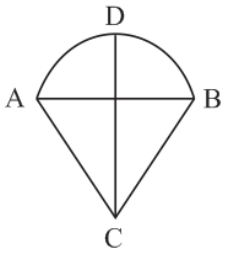
33. An equilateral triangle ABC and a semicircle are attached as shown. D is mid point of arc AB. If CD = $2\sqrt{3}$, then length of arc AB is

(A) $(3-\sqrt{3})\pi$

(B) $(5+\sqrt{3})\pi$

(C) $(3+\sqrt{3})\pi$

(D) $(2-\sqrt{3})\pi$



SPACE FOR ROUGH WORK

34. The legs a right triangle are 18 & 24 cm. The distance of orthocenter from centroid is
(A) 10 (B) 8 (C) 12 (D) None

35. The sum of all the solution of equation $3^x + \frac{81}{3^x} = 30$ is
(A) 2 (B) 3 (C) 4 (D) 5

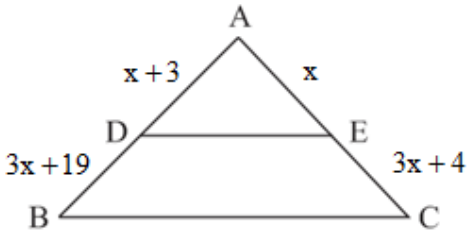
36. The mean of N numbers is N, the mean of subset of M numbers of given numbers is $M\,(M < N)$. Mean of remaining $(N - M)$ numbers is:
(A) M (B) N (C) N – M (D) N + M

37. If n is a perfect square, next perfect square will be :
(A) $n^2 + 1$ (B) $n^2 + n$ (C) $n^2 + 2\sqrt{n}$ (D) $n + 2\sqrt{n} + 1$

38. If sum of all edges of a cube is 36 cm , then the volume of that cube is
(A) 8 (B) 27 (C) 64 (D) 729

39. For set of numbers 2, 2, 4, 5 & 12 which statement is true?
(A) Mean = Medium (B) Mean > Mode
(C) Mean < Mode (D) Mode = Median

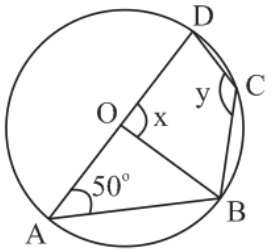
40. In given figure DE || BC, find x.



(A) 4 (B) 3 (C) 2 (D) 1

SPACE FOR ROUGH WORK

41. In given figure, find $(x+y)$



(A) 210° (B) 220° (C) 230° (D) 240°

42. Which of the following is not the factor of the polynomial $p(x) = x^3 - 7x - 6$?

(A) $(x+1)$ (B) $(x+2)$ (C) $(x-3)$ (D) $(x-2)$

43. $\sqrt{(\sin^2 x + \cos ec^2 x) + (\cos^2 x + \sec^2 x) - (\tan^2 x + \cot^2 x)}$ equals

(A) 1 (B) $\frac{\sqrt{3}}{2}$ (C) $\sqrt{3}$ (D) $\frac{1}{2}$

44. If x, y, z satisfy yz = 1, zx = 2, xy =3, then $(x^2 + y^2 + z^2)$ is

(A) $\frac{17}{2}$ (B) $\frac{25}{3}$ (C) $\frac{33}{4}$ (D) $\frac{49}{6}$

SPACE FOR ROUGH WORK

45. A train 1.2 km long running at 90km/hr crosses a 1.8 km long bridge in
(A) 1 min (B) 2 min (C) 3 min (D) 4 min

46. Two equal glasses filled with alcohol & water in ratio 2 : 1 & 3 : 2 are emptied into a third glass. The proportion of alcohol & water in third glass will be:
(A) 13 : 17 (B) 19 : 7 (C) 13 : 11 (D) 19 : 11

47. The dimension of a hall are 40 m, 25 m & 20m. If each person require 200 m^3, no. of people that can be accommodated in hall are :
(A) 150 (B) 140 (C) 120 (D) 100

48. The value of $\frac{119^2+(119)(111)+(111)^2}{(119)^3-(111)^3}$ is
(A) 8 (B) $\frac{1}{8}$ (C) $\frac{1}{230}$ (D) 230

49. Angle between hour & minute hand of a clock at 2 : 15 PM. would be :
(A) 30° (B) 5° (C) $22\frac{1}{2}°$ (D) $7\frac{1}{2}°$

50. The absolute difference of roots of $x^2-7x-9=0$ is
(A) 7 (B) $\frac{7}{2}$ (C) $\sqrt{91}$ (D) $\sqrt{85}$

SPACE FOR ROUGH WORK

PACE IIT | MEDICAL

ANDHERI / BORIVALI / DADAR / THANE / POWAI / CHEMBUR / NERUL / KHARGHAR

ANSWERS KEY

Question	Answer	Question	Answer
1	A	26	B
2	C	27	A
3	B	28	C
4	B	29	B
5	C	30	D
6	C	31	C
7	D	32	C
8	D	33	A
9	C	34	A
10	B	35	C
11	B	36	D
12	D	37	D
13	C	38	B
14	C	39	B
15	A	40	C
16	C	41	C
17	C	42	D
18	C	43	C
19	B	44	D
20	B	45	B
21	C	46	D
22	C	47	D
23	B	48	B
24	A	49	C
25	A	50	D