Mathematics Paper – XI (01) (19)

Name

Roll No

ا۔ ہر سوال کے سامنے چار دائرے دیے گئے ہیں، صرف صحیح جواب والا دائرہ بھر دیں۔

2۔ دائروں کو شیڈ (بھرنے) کے لئے نیلے یا کالے رنگ کا بال پوائنٹ استعمال کریں۔

3۔ جواب میں ایک سے زائد دائرے بھرنے سے جواب غلط تصور ہوگا۔

Time Allowed: 20 Minutes | SECTION – A | Marks : 20

1	Period of sec(3x) is.....	○ π	○ 0	○ 2π	● $\frac{2\pi}{3}$
2	The graph of $y = 2x^2 + 1$ is.....	● Parabola	○ circle	○ straight line	○ None of these
3	The amplitude of 5sin(2x) is.....	○ 1	○ –5	● 5	○ 10
4	The inverse function of $f(x) = \frac{x}{x-1}$ is...	○ $\frac{x-1}{x}$	○ $\frac{x+1}{x-1}$	○ $\frac{x}{1-x}$	● $\frac{x}{x-1}$
5	When x = 5, then $\frac{7! \times 6!}{x! \times (x+1)!}$ =....	○ 36	● 42	○ 7	○ 7!
6	$1 - x + x^2 - x^3 + ...$ is the expansion of...	○ $(1-x)^{-2}$	○ $(1-x)^{-1}$	○ $(1+x)^{-2}$	● $(1+x)^{-1}$
7	If $\vec{c}$ lies in the plane of $\vec{a}$ and $\vec{b}$, then $\vec{c}$ =.....	○ $\alpha\vec{a}+\beta\vec{b}$	● $\alpha\vec{a}\times\beta\vec{b}$	○ $\alpha\vec{a}\cdot\beta\vec{b}$	○ $\vec{0}$
8	The domain of $f(x) = \sqrt{x+1}$ is the set of all.....	○ $x > 0$	○ $x > 1$	● $x \geq -1$	○ $x < -1$
9	The solution of linear inequality $3x - 2 \geq 8 + 5x$ is.....	○ $[-\infty, 5)$	● $(-\infty, -5]$	○ $[-\infty, 5)$	○ $[-\infty, -5]$
10	In right angled ΔABC $\alpha = 57°$ then β=...	○ 57	● 90°	○ 33′	○ 33°
11	The multiplicative inverse of $Z = 2 + 3i$ is.....	○ $2 - 3i$	○ $-2 - 3i$	● $\frac{2}{13} - \frac{3}{13}i$	○ $\frac{2}{13} + \frac{3}{13}i$
12	Let $A = \begin{bmatrix} 3 & -2 \\ 5 & 7 \end{bmatrix}$. Then the co-factor of –2 is.....	● –5	○ 2	○ –2	○ 5
13	The direction cosines of $\vec{a} = 2i - j + K$ are.....	○ 2, 1, –1	○ 2, –1, 1	● $\frac{2}{\sqrt{6}}, \frac{-1}{\sqrt{6}}, \frac{1}{\sqrt{6}}$	○ $\frac{2}{\sqrt{6}}, \frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}$
14	Let $A^2 = A$, then $\sum_{i=1}^{3} A^i$ =.....	○ A	○ 2A	○ A^3	● 3A
15	$\sum_{k=1}^{n} K^2$ =.....	○ $\frac{n(n+1)}{2}$	● $\frac{n(n+1)(2n+1)}{6}$	○ $\left[\frac{n(n+1)}{2}\right]^2$	○ None of these
16	A fair die is rolled, the probability that even integer will occur is.....	● $\frac{1}{2}$	○ $\frac{1}{3}$	○ $\frac{1}{4}$	○ $\frac{1}{6}$
17	The A.M between 6th and 8th term of the A.P 1,4,7,10,.....is.....	○ 16	○ 22	● 19	○ 48
18	The vector perpendicular to $-I + 2j + k$ and $3i - k$ is.....	○ $5i - j - 3k$	○ $-5i - j - 3k$	○ $-5i + j + 3k$	● None of these
19	If $\frac{p}{q}$ is the third term of an H.P, then third term of corresponding A.P will be ..	○ p	● $\frac{q}{p}$	○ q	○ $\frac{p}{q}$
20	Coefficient of third term in the expansion of $\left(x + \frac{1}{2x}\right)^8$ is.....	● 7	○ 14	○ 56	○ 9

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MATHEMATICS (New)

Inter Part-I

(Fresh/Reappear)

Note: **Time allowed for Section – B and Section – C is 2 Hours and 40 minutes.**

Section – B

Marks: 50

Q-II Answer any TEN parts. Each part carries FIVE marks.

1. If $Z_1 = 1 + 3i$, $Z_2 = 2 + 3i$ evaluate $\frac{|Z_1|}{|Z_2|}$

2. For what value of λ the homogeneous system $x + 5y + 3z = 0$, $5x + y - \lambda z = 0$, $x + 2y + \lambda z = 0$ has non-trivial solution.

3. Solve the triangle for which a = 9, b = 7, c = 5.

4. Find the unit vector perpendicular to both $\vec{a} = i + j + 2k$ and $\vec{b} = -2i + j - 3k$

5. For a G.P $a_{10} = \ell$, $a_{13} = m$, $a_{16} = n$ show that $\ell n = m^2$

6. Given $a_n = 201$ for the A.P 5,9,13,.....Find n.

7. Find the area of the inscribed circle of the triangle with measures of the sides 55m, 25m, 70m.

8. Solve for 'n' ${}^{n+1}C_4 = 6.\ {}^{n-1}C_2$

9. Prove by mathematical induction $5 + 10 + 15 + \ldots\ldots + 5n = \frac{5n(n+1)}{2}$

10. Find (without graphing) the vertex, intercepts and axis of $f(x) = x^2 + 2x - 3$.

11. Prove the identity $\frac{\sin(\alpha) + \sin(9\alpha)}{\cos(\alpha) + \cos(9\alpha)} = \tan(5\alpha)$

12. Verify that $(AB)^{-1} = B^{-1}A^{-1}$, when $A = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 1 \\ 2 & 3 \end{bmatrix}$

13. Graph $y = -\cos(x)$ in $0 \le x \le 2\pi$

Section – C

Marks: 30

Note : Attempt any THREE questions. Each question carries equal marks.

Q-III (a) Find the period, frequency, maximum and minimum value of the function $y = 5 - 4\sin(\theta + 30)$

(b) Show that $\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{8}{19} = \frac{\pi}{4}$

Q-IV (a) IF x^4 and higher powers be neglected, then show that $(1+x)^{\frac{1}{4}} + (1-x)^{\frac{1}{4}} = a - bx^2$. Find also 'a' and 'b'.

(b) Show by mathematical induction that $\frac{3^{2n} - 2^{2n}}{5}$ is an integer for all positive integers.

Q-V (a) Prove that ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$

(b) What is the smallest angle of a triangle whose sides measure 25, 18 and 21 ft?

Q-VI (a) Solve the system of equation $2x + 4y - z = 10$, $x - 2y - 2z = -4$, $3x + y + z = 7$ by Gauss elimination method.

(b) Show that $f(x) = x\sqrt{x^2 + 3}$ is odd function.