Name

Mathematics Paper – XI (01) (18)

1۔ 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 مار کر استعمال کریں۔

3۔ جواب میں ایک سے زائد دائرے بھرنے سے جواب غلط تصور ہو گا۔

Roll No

Time Allowed: 20 Minutes

SECTION – A

Marks : 20

1	Solution of $2x + 3 < x$ is.....	○ $x > 3$	● $x < -3$	○ $x > -3$	○ $x \geq 3$
2	$\text{Cos}(\alpha - \beta) - \text{Cos}(\alpha + \beta) =$	○ $2\text{Cos}\alpha\,\text{Cos}\beta$	○ $2\text{Sin}\alpha\,\text{Cos}\beta$	● $2\text{Sin}\alpha\,\text{Sin}\beta$	○ $2\text{Cos}\alpha\,\text{Sin}\beta$
3	$\text{Cos}\left(\frac{3\pi}{2} - \theta\right) =$	○ $\text{Cos}\theta$	○ $-\text{Cos}\theta$	○ $\text{Sin}\theta$	● $-\text{Sin}\theta$
4	$2\text{Cos}\left(\frac{\theta+\phi}{2}\right)\text{Sin}\left(\frac{\theta-\phi}{2}\right) =$	● $\text{Sin}\theta - \text{Sin}\phi$	○ $\text{Sin}\theta + \text{Sin}\phi$	○ $\text{Cos}\theta + \text{Cos}\phi$	○ $\text{Cos}\theta - \text{Cos}\phi$
5	In half angle formula $\sqrt{\frac{S(S-C)}{ab}} =$	○ $\text{Sin}\frac{\alpha}{2}$	○ $\text{Cos}\frac{\alpha}{2}$	● $\text{Cos}\frac{\gamma}{2}$	○ $\text{Sin}\frac{\beta}{2}$
6	$\text{Tan}\left(\frac{-37\pi}{4}\right) =$	○ $\frac{\pi}{4}$	○ 1	○ 0	● -1
7	$(2i - 3j) \times K =$	○ $3i - 2j$	● $-3i - 2j$	○ $3i + 2j$	○ $2i - 3j$
8	$j.i \times K =$	○ i	○ 0	○ 1	● -1
9	In inserting n arithmetic means between a and b then b = ...	○ a_n	○ a_{n-1}	○ a_{n+1}	● a_{n+2}
10	In the Geometric Sequence $-96, 24, -6,$..... the fifth term is.....	○ $\frac{3}{2}$	● $-\frac{3}{8}$	○ 3	○ -2
11	$\frac{5!}{6!4!} =$	○ $\frac{1}{136}$	○ $\frac{1}{124}$	● $\frac{1}{144}$	○ $\frac{1}{30}$
12	$\sum_{i=0}^{n}\binom{n}{i}a^{n-i}b^i =$	○ $(a-b)^n$	● $(a+b)^n$	○ $(a+b)^{-n}$	○ $(a-b)^{-n}$
13	A function which is both one – one and onto is called.....	○ Injective	○ Surjective	● Bijective	○ None of these
14	$i^{-3} =$	● i	○ $-i$	○ 1	○ -1
15	$Z\bar{Z}$ is equal to.....	● $\lvert Z\rvert^2$	○ Z	○ $\bar{Z}$	○ $\lvert -Z\rvert$
16	In $(x + iy)^2$ the real part is.....	○ x	○ $x^2 + y^2$	● $x^2 - y^2$	○ $2xy$
17	If $A^t = A$ then A is called.....	○ Transpose matrix	● Symmetric matrix	○ Skew symmetric	○ Inverse matrix
18	A system AX = 0 of three homogeneous linear equations in three variables has.....solution if $\lvert A\rvert \neq 0$.	○ Many	○ Unique	● Trivial	○ Non-trivial
19	A square matrix is identity matrix if and only if $aij = 0$ for $i \neq j$ and $aij = 1$ for.....	● $i = j$	○ $i < j$	○ $i > j$	○ None of these
20	$K \times j =$	○ i	● $-i$	○ j	○ K

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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.** **Marks:** 50

Section – B

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

1. Separate into real and Imaginary parts $(3-4i)^{-1}$.

2. Evaluate. $\begin{bmatrix} 3 & 1 & 2 \\ 6 & -5 & 4 \\ -9 & 8 & -7 \end{bmatrix}$

3. If $P = 2i - j$ and $q = xi + 3j$ then find the value x such that $|p + q| = 5$

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

5. Find x so that $x + 7, x - 3, x - 8$ forms a three term geometric sequence in the given order.

6. Sum to n terms the series $1 + 2x + 3x^2 + 4x^3 + \ldots\ldots\ldots\ldots$

7. Solve for n, ${}^nP_5 = 9\left({}^{n-1}P_4\right)$

8. $2^n > n \quad \forall\, n \in N$ prove.

9. Find the point of intersection graphically of the functions $f(x) = -x + 2 \quad g(x) = 2x + 1$

10. Prove that $\dfrac{\cos^3\theta - \sin^3\theta}{\cos\theta - \sin\theta} = \dfrac{2 + \sin 2\theta}{2}$

11. In any triangle ABC, show that $\dfrac{a+b}{a-b} = \dfrac{\tan\left(\frac{\alpha+\beta}{2}\right)}{\tan\left(\frac{\alpha-\beta}{2}\right)}$

12. Find the period of $y = \dfrac{1}{2}\sec x$

13. Show that $\sin^{-1}x + \cos^{-1}x = \dfrac{\pi}{2}$

Section – C

Marks: 30

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

Q-III (a) Find the rank of $\begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 1 \\ -1 & 2 & 3 \end{bmatrix}$

(b) How many terms are there in the arithmetic sequence in which the first and the last terms are $\frac{33}{4}$ and $\frac{25}{2}$ respectively and the common difference is $\frac{1}{8}$

Q-IV (a) Find n and r if ${}^nP_r = 840$ and ${}^nC_r = 35$

(b) Prove that $2^{2n} - 1$ is multiple of 3 for all positive integers.

Q-V (a) An isosceles triangle has avertical angle of 108° and a base 20 cm long. Calculate its altitude.

(b) Minimize $f(x,y) = 3x + 4y$ subject to the constraints $2x + 3y \geq 6, x + y \leq 8, x \geq 0, y \geq 0$.

Q-VI (a) Find the area of the inscribed circle of the triangle with measures of the sides 55m, 25m and 70m.

(b) Show that $\cos(\sin^{-1}x - \sin^{-1}y) = \sqrt{(1-x^2)(1-y^2)} + xy$