Mathematics Paper – XI (01) (17)

Roll No Name

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

Time Allowed: 20 Minutes SECTION – A Marks : 20

$(-i)^{23}$ = ...	○ $-i$	● i	○ 1	○ -1
If in a square matrix A, $A^t = -A$, then the matrix A is called.....	○ Singular	○ Non singular	○ Symmetric	● Skew symmetric
A square matrix $A = \begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$ is a ..... matrix.	○ Scalar	○ Row	○ Column	● Diagonal
In matrix multiplication the .....property do not hold.	○ Associative	● Commutative	○ Distributive	○ Inverse
If a matrix A is singular, then the system Ax = B has.....solution.	○ Unique	○ An infinite	● No	○ None of these
If $\vec{a}$ is a vector then the unite vector denoted as $\hat{a}$ = ...	○ $\hat{a}\|a\|$	○ $\frac{\|a\|}{\vec{a}}$	○ $\hat{a} + \|a\|$	● $\frac{\vec{a}}{\|a\|}$
If $\vec{a}$ and $\vec{b}$ are two vectors, then the length of $(\vec{a} \times \vec{b})$ is $\|a \times b\|$ = ...	○ $\|a\|\|b\|\cos\theta$	○ $\|a\|\|b\|\sin\theta\,\hat{n}$	● $\|a\|\|b\|\sin\theta$	○ $\|a\|\|b\|\cos\theta\,\hat{n}$
If α, β, γ are the direction angles of vector $\vec{r}$, then $\cos^2\alpha + \cos^2\beta + \cos^2\gamma$ = ...	● 1	○ Zero	○ -1	○ $\frac{\pi}{2}$
If A, G and H are the A. Mean, G. Mean and Hormonic Mean then.....	○ A > H > G	○ G > H > A	○ A < G > H	● A > G > H
When a coin is tossed then the probability of getting head is	○ $\frac{1}{3}$	● $\frac{1}{2}$	○ $\frac{1}{4}$	○ $\frac{1}{6}$
If A and B are mutually exclusive events, then P (A) + P(B) = ...	● P(A ∪ B)	○ P(A ∩ B)	○ P(A – B)	○ P(A + B)
The fourth term of the sequence $a_n = (-1)^n \frac{n+1}{n}$ is.....	○ $\frac{3}{4}$	○ $\frac{-4}{5}$	○ $\frac{5}{6}$	● $\frac{5}{4}$
A function f : x –> y is said to be ..... if each element of y is the image of some element in x.	○ Injective	● Surjective	○ Bijective	○ One – one
If f (– x) = – f (x) then the function is called an .....function.	● Odd	○ Even	○ Identity	○ Linear
The an equality $n^2 > n + 3$ is true for...	○ n = 1	○ n = 2	● n = 3	○ n = 0
$\cos\frac{\theta}{2}$ = ...	○ $\sqrt{\frac{1-\cos\theta}{2}}$	● $\sqrt{\frac{1+\cos\theta}{2}}$	○ $\sqrt{\frac{1-\sin\theta}{2}}$	○ $\sqrt{\frac{1+\sin\theta}{2}}$
$2\cos\left(\frac{\theta+\phi}{2}\right)\sin\left(\frac{\theta-\phi}{2}\right)$ =.....	○ $\sin\theta + \sin\phi$	● $\sin\theta - \sin\phi$	○ $\cos\theta + \cos\phi$	○ $\cos\theta - \cos\phi$
2π is the period of	○ Cosec θ	○ Sec θ	○ Cot θ	● A and B
The reciprocal of the period is called the .....of the function.	○ Amplitude	○ Wave length	● Frequency	○ Inverse period
$\text{Sec}^{-1}x$ = ...	● $\text{Cos}^{-1}\left(\frac{1}{x}\right), x \neq 0$	○ $\text{Cos}^{-1}(x)$	○ $\frac{1}{\text{Cos}\,x}$	○ $\frac{1}{\text{Cos}^{-1}x}$

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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. Separate into real and imaginary parts of $Z = (2a - bi)^{-2}$.

2. Solve for x $\begin{vmatrix} x & 2 & 3 \\ 0 & -1 & 1 \\ 0 & 4 & 5 \end{vmatrix} = 9$.

3. Find the coordinates of point P if $|\vec{OP}| = 6$ and $\vec{OP}$ is in the direction of $2i - 3j + 6k$.

4. If in an AP, $a_1 = 43$, $a_{10} = 7$ find a_{25}.

5. Find the sum S_n of the first n terms of the sequence $\left\{\left(\frac{1}{2}\right)^n\right\}$.

6. Find n; $\frac{n!}{(n-4)!} : \frac{(n-1)!}{(n-4)!} = 9 : 1$

7. A sample space S = (A U B), P (A) = 0.75 and P (B) = 0.65 Find P (A ∩ B).

8. Show by mathematical induction that $\frac{3^{2n} - 2^{2n}}{5}$ is an integer.

9. $f(x) = \frac{x-1}{x-4}$, $x \neq 4$ find the domain and range of f^{-1}.

10. Graph the system of linear equations
$2x + y \leq 8$
$x + y \leq 6$
$y \geq 0$

11. Prove $\text{Cosec } 2\alpha - \text{Cot} 2\alpha = \text{Tan}\,\alpha$.

12. If a cone is 8.4 cm high and has a vertical angle of 72°, Calculate the diameter of its base.

13. Show that $r_1 r_2 r_3 = rS^2$

Section – C

Marks: 30

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

Q-III (a) Show that $\begin{vmatrix} \gamma\cos\theta & 0 & \gamma\sin\theta \\ 1 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{vmatrix} = \gamma$

(b) If $\vec{a} = 3i - j - k$, $\vec{b} = -2i + 4j - 3k$, $c = i + 2j - k$, then find a unite vector parallel to $3a + 2b + 4c$.

Q-IV (a) Show that the sum of the first n positive odd integers is n^2.

(b) The sum of an infinite geometric series is 15 and the sum of their squares is 45. Find the series.

Q-V (a) Find n when ${}^{2n}C_3 : {}^{n}C_2 = 36 : 3$.

(b) Find the sum to infinity $1 + 2.\frac{1}{3} + 3.\frac{1}{3^2} + 4.\frac{1}{3^3} + \ldots\ldots$

Q-VI (a) Prove that $\frac{\cot^2\beta - 1}{\text{Cosec}^2\beta} = \text{Cos}2\beta$.

(b) Find the area of the inscribed circle of the triangle whit measures of the sides 55m, 25m and 70m.