CLASS XII
GUESS PAPER
MATHS

M.M.100 **TIME: 3 HOURS**

SECTION A [1x 4=4]

1.If $|A|$ =4. Find the value of $|adj(adjA)|$.

2.Find the slope of the tangent to the curve y=x +2x – 1 at (1, 2).

3. Find the value of $\int_{-\pi}^{\pi} sin^5 x cos^3$x dx.

4. Find the value of $(\vec{a}.\hat{\imath})\,\hat{\imath} + (\vec{a}.\hat{\jmath})\,\hat{\jmath} + (\vec{a}.\hat{k})\,\hat{k}$

OR

Find the value of 'p' if the vectors lines $\vec{a} = \hat{\imath} + 2\hat{\jmath} - p\hat{k}$ and $\vec{b} = 4\hat{\imath} - 2\hat{\jmath} - \hat{k}$

SECTION B [2x8=16]

5. Evaluate $\int sin\frac{(2tan^{-1}x)}{1+x^2}dx$

6. Evaluate $\int_0^{\frac{\pi}{4}} \sqrt{1 - sin2x}$ dx OR

7 Form the differential equation by eliminating c which is an arbitrary constant. c$(y + c)^2 = x^3$

OR

Show that $y_2 + 4y = 0$ if $y = Acos2x + Bsin2x$

8. Find the area of the quadrilateral whose vertices are (1,-1,1) (2,3,1) (1,2,3) and (0,-2,3) on a plane.

9. Given $p(A + B) = \frac{5}{6}$, $p(AB) = \frac{1}{3}$ $P(B^C) = \frac{1}{2}$. Find $p(A)$ and $p(B)$

OR

A black and a red die are rolled. Find the conditional probability of obtaining the sum 8,given that the red die resulted in a number less than 4.

10. A pair of dice is thrown 7 times. What is the probability of getting a sum 7 atmost 7 times.

11. Let R be a relation on the set A of order pair of integers defined by (x,y) =(u,v) iff xv =yu. Show that R is an equivalence relation.

12. If $\begin{vmatrix} 2x+5 & 3 \\ 5x+2 & 9 \end{vmatrix} = 0$ find the value of x

OR

If λ ≠ 0 and $\begin{vmatrix} x+\lambda & x & x \\ x & x+\lambda & x \\ x & x & x+\lambda \end{vmatrix} = 0$, then find the value of x.

SECTION C [4x11=44]

13 Evaluate $\int \frac{dx}{(sinx-2cosx)(2sinx+cosx)}$

OR

Evaluate $\int_0^{\frac{\pi}{4}} sin2x \log(tanx)dx$

14. Solve $xcosx\frac{dy}{dx}+y(xsinx+cosx)=1$, $0<x<\frac{\pi}{2}$

OR

Solve: $x\frac{dy}{dx}-y=\sqrt{x^2+y^2}$

15. Evaluate $\int \frac{tan^{-1}x}{(1+x)^2}dx$

16. Whether the lines $\vec{r}=\hat{\imath}+\hat{\jmath}-\hat{k}+s(\hat{3\imath}-\hat{\jmath})and\ \vec{r}=4\hat{\imath}-\hat{k}+t(2\hat{\imath}+\hat{k})$ will intersect or not.

If intersect find the point of intersection.

17Let * be a binary operation on N, given by a *b = H.C.F. of a,b for all a,b ϵ N. Check whether * ia commutative and associative.

18. Solve: $\sin^{-1}\frac{3x}{5}+sin^{-1}\frac{4x}{5}=sin^{-1}x$

OR

Show that cos $(2\tan^{-1}1/7)$ = sin$(4\ \tan^{-1})$

18. Prove that $\begin{vmatrix} b^2+c^2 & ab & ac \\ ba & c^2+a^2 & bc \\ ca & cb & a^2+b^2 \end{vmatrix}$ =$4a^2b^2c^2$

21. Find k, if f(x)=$\begin{cases}\frac{\log(1+x)-\log(1-x)}{x} & ,if\ x\neq 0\\ k & ,if\quad x=0\end{cases}$, is continuous at x = 0.

22. Find $\frac{dy}{dx}$ if y = cos x^x + sin x.

23. Find the value of of p, for which the curve x^2 = 9p(9p- y) and x^2 = p(y+1) cut each other orthogonally.

SECTION D [6x6=36]

24. If A=$\begin{vmatrix}1 & 2 & 0\\ -2 & -1 & -2\\ 0 & -1 & 1\end{vmatrix}$, find the A^{-1} and solve x- 2y=10, 2x –y – z =8 and -2y + z = 7

OR

If A=$\begin{bmatrix}1 & 1 & 1\\ 1 & 0 & 2\\ 3 & 1 & 1\end{bmatrix}$, find A^{-1} by using elementary transformation method.

25. Find the area of the region bounded by x^2+y^2= 25, 4y = $|4-x^2|$ and x = 0, which lies on the Ist quadrant.

OR

Find the area of the smaller part of the circle $x^2+y^2=a^2$ and the line x=$\frac{a}{\sqrt{2}}$.

26. A variable plane which remain at constant distant 3p from the origin cuts the coordinate axes A, B ,C. Show that the locus of the centroid of the triangle ABC is $X^{-2}+Y^{-2}+Z^{-2}=P^{-2}$.

27. A young man rides his motorcycle at 25 km/Hr, he had to spend Rs. 2 per km on petrol. If he drive faster 40 km/Hr he spends Rs. 5 per km. H has Rs. 100 to spend on petrol. Find the maximum distance he can travel in one hour. Solve graphically.

28. An anti-aircraft gun can take a maximum of four shots at an enemy plane. The probability that of hitting the plane at 1st, 2nd, 3rd, and 4th shots are 0.6, 0.5, 0.4 and 0.3 respectively. What is the probability that the gun strikes the plane?

29. Find the area of the greatest rectangle that can be inscribed in an ellips $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1.$

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