CLASS XII
GUESS PAPER
MATHS

Time Allowed:3 hrs   **M.M.100**

General Instructions:

1. All questions are compulsory. Attempt all questions.
2. The question paper consists of three sections
3. Section A consists of 10 questions. Each question carries 1 mark
4. Section B consists of 12 questions. Each question carries 4 marks
5. Section C consists of 7 questions. Each question carries 6 marks
6. There is no overall choice. However internal choice has been provided.

Section-A

1) If f(x) = $\frac{1-x}{1+x}$ is an invertible function, then find the inverse of f(x)?

2) Find the principal value of $\sin^{-1}\left(\frac{-1}{2}\right)$+$\cos^{-1}\left(\frac{-1}{2}\right)$?

3) If $\begin{bmatrix} 3y-x & -2x \\ 3 & 7 \end{bmatrix}$=$\begin{bmatrix} 5 & -2 \\ 3 & 7 \end{bmatrix}$, find x and y?

4) If |A|=2 where A is 2X2 matrix, find | adj A |?

5) For what value of a ,the matrix $\begin{bmatrix} 2a & -1 \\ -8 & 3 \end{bmatrix}$, is a singular matrix?

6) Evaluate:$\int \frac{1+\cot x}{x+\log\sin x}$ dx?

7) Evaluate:$\int x\ \sin^{-1}x\ dx$?

8) Find the unit vector in the direction of$2i-3j+6k$?

9) Find the angle made by i-k with y axis?

10) Find the vector equation of line $\frac{x-5}{3} = \frac{y+4}{7} = \frac{z-6}{2}$?

Section-B

11) Show that the function defined by f:R →R given by f(x)=ax+b , where a,b €R and a≠0,is a bijection.

12) Solve for x : $\tan^{-1}(x+2) + \tan^{-1}(x-2) = \tan^{-1}\frac{8}{79}$;x>0.

13) If $\cos y = x\cos a + y$,$prove\ that\ \frac{dy}{dx}$ =$\cos^2$ (a+y)/sin a?

14) Prove that $(\frac{x}{a})^n$+$(\frac{y}{b})^n$=2 touches the curve $\frac{x}{a} + \frac{y}{b} = 2$ for all n € N at the point(a,b)?

15) Find the particular solution of the differential equation (x+y)dy + (x-y)dx=0 given that when x=1,y=1?

16) Solve the differential equation: $\frac{dy}{dx} + 2y\tan x = \sin x$

17) If a,b,c are the lengths of the sides opposite to the angles A,B,C of a ΔABC,then using vectors ,prove that Cos A =(b^2+c^2-a^2)/2bc ?

18) Find the image of the point (1,3,4)in the plane x-y+z=5 .hence show that this image lies in the plane x-2y+z-7=0.

19) Prove the following using properties of determinants:

$$\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+c & 1 \\ 1 & 1 & 1+c \end{vmatrix} = ab+bc+ca+abc$$

Or

If A=$\begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$,find the value of a and b such that A^2+aA+bI=0.Hence find A^{-1}

20) On a multiple choice examination with three possible answers for each of 5 questions, what is the probability that a candidate could get four or more correct answers just by guessing?

Or

A coin is tossed 4 times .Find the mean and variance of the probability distribution of number of heads?

21) Evaluate: $\int \frac{1}{\cos(x-a)\cos(x-b)} dx$

Or

Evaluate: $\int_0^\pi \frac{x\tan x}{\sec x \, cosec\, x} dx$

22) Prove that the greatest integer function defined by f(x)=[x];0<x<3is not differentiable at x=1?

Or

Find all points of discontinuity of f defined by f(x)=|x|+|x-1|?

Section-C

23) Find the inverse of the matrix using elementary transformations:

$$\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$$

24) A point on the hypotenuse of a triangle is at distances a and b from the sides. Show that the minimum length of the hypotenuse is(a$^{2/3}$+b$^{2/3}$)$^{3/2}$.

25) Using integration, Find the area of the region enclosed between two circles x^2+y^2=1 and (x-1)^2+y^2=1.

26) A variable plane is at a constant distance 3p from the origin and meets the axes in A,B,C respectively, then show that locus of centroid of ΔABC is $\frac{1}{x2} + \frac{1}{y2} + \frac{1}{z2} = \frac{1}{p2}$

27) A manufacturer produces nuts and bolts .it takes 1 hr of work on machine A and 3 hrs of work on machine B to produce a packet of nuts. It takes 3 hrs of work on machine A and 1 hr of work on machine B to produce a packet of bolts.he earns a profit of Rs 17.50 per packet on nuts and Rs 7.00 per packet on a packet of bolts. How many packets of each should be produced each day so as to maximise his profit, if he operates each of his machines at the most 12 hrs a day? Form an L.P.P. for the problem and solve it graphically?

28) Two bags A and B contain 4 white and 3 black balls and 2 white and 2 black balls respectively. From bag A, two balls are drawn at random and then transferred to bag B.A ball is then drawn from Bag B and is found to be a black ball .what is the probability that transferred balls are 1 white and 1 black?

29) Evaluate : $\int_0^3 (x^2-5)dx$ as a limit of a sum?

Or

Evaluate: $\int \sqrt{\tan\theta}\ d\theta$

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