CBSE Mathematics Sample Papers for Class 12

General Instructions for CBSE mathematics sample papers for class 12 are:

(i) All questions are compulsory.

(ii) The question paper consists of 29 questions, divided into three sections A,B,C.

(iii) All questions in section A comprises of 10 question of 1 mark each. Section B comprises of 12 questions of 4 mark each and section C is of 7 questions of 6 mark each.

(iv) There is no overall choice. However internal choices have been provided in the question. You have to attempt only one of the alternatives in such questions

(v) Use of calculator is not permitted.

SECTION-A   (1*10=10)

1. Let * be the binary operation on N given by a*b=L.C.M of a and b. find the identity of * on N.**[1]**

2. If $\sin[\sin^{-1}1/5+\cos^{-1}x]=1$,then find the value of x. **[1]**

3. If a=   1 0 0

0 1 0   prove that $a^2=-1$

0 b -1

4.if X_{m*3} $Y_{n*4}=Z_{2*b}$ for three matrices X,Y,Z. find the values of m,n and b. **[1]**

5. **I**f A= 2B where A and B are square matrices of order 2, then find the relation between| A| and |B| **[1]**

6. A circular disc of radius 3 cm is being heated. Due to its expansion its radius increases at the rate of 0.05 cm/sec.find the rate at which the area is increasing when radius is 3.2cm. **[1]**

7.Evaluate the following integral. $e^x dx/1+e^{2x}$. **[1]**

8.If the sum of two unit vectors is a unit vector. Find the magnitude of their difference.**[1]**

9.If a=i+j+k ,b=2i-j+3k and c=i-2j+k. find an unit vector parallel to the vector 2a-b+3c. **[1]**

10.Find the direction cosines of the perpendicular from the origin to the plane r.(6i-3j+2k)+1=0 **[1]**

SECTION B   (4*12=48)

11.Prove the following : $\tan^{-1}1/4+\tan^{-1} 2/9=1/2 \cos^{-1}3/5$**. [4]**

12.Using the properties of determinants show that   **[4]**

$$\begin{vmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = (1+a^2+b^2)^3$$

13. Solve the following equation for x: $\sin^{-1}x+\sin^{-1}(1-x)=\cos^{-1}x$ **[4]**

14. Verify Lagrange's mean value theorem for the function f(x)=x+1/x in [1,3] **[4]**

15. Using rolle's theorem find the point on the curve y=16-x2.x=[-1,1],where the tangent is parallel to x axis. **[4]**

16. If $x^y+y^x=a^b$ find dy/dx. **[4]**

17. If x=a(cost+tsint), y=b(bsint -tcost) find d^2y/dx^2. **[4]**

18. Find the particular solution of the following differential equation (x+1)dy/dx=2e^{-y}-1 given that y=0 when x=0 **[4]**

19. Fnd the intervals in which the function f(x)=(x+2)$^{e-x}$ is strictly increasing or decreasing. **[4]**

20.Find the equation of plane passing through the point(1,2,1) and perpendicular to the line joining the points (1,4,2) and (2,3,5). Also find the perpendicular distance of the plane from the origin. .**[4]**

21. Find the area of triangle having the points A(1,1,1),B(1,2,3)and C(2,3,1) as its vertices. **[4]**

22. A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a 6.**[4]**

OR

For A,B,C the chances of being selected as a manager of a firm are 4:1:2 respectively. The respective probabilities for them to introduce a radical change in marketing strategy are 0.3 ,0.8 and 0.5 respectively.if the change does takes place,find the probability that it is due to appointment of B. **[4]**

SECTION C   (6*7=42)

23.Obtain the inverse of the following matrix,using elementary operations.   **[6]**

A=   3 0 -1

2 3   0

0   4   1

24. A wire of lengthy 25m is to be cut into two pieces, one piece is bent into a circle the other into a square. What should be the lengths of the pieces so that the combined area of the square and the circle is minimum. **[6]**

25. Find the area of the region included between the curve $4y=3x^2$ and the line $2y=3x+12$. **[6]**

26. Find the integration of $(Xdx/a^2cos^2x+b^2sin^2x)$ **[6]**

27. Find the image of the point (1,6,3) in the line $x/1=(y-1)/2=(z-2)/3$ **[6]**

28. A factory makes tennis rackets and cricket bats. A tennis racket takes 1.5 hrs of machine time and 3 hrs of craftsman time in its making while a cricket bat takes 3 hrs of machine time and 1 hr of craftsman time .in a day the factory has the availability of not more than 42 hrs of machine time and 24hrs craftsman time. If the profit on the racket and bat is rs. 20 and 10. Find the no. of tennis rackets and cricket bats that the factory must manufacture to earn the maximum profit. Make it as an LPP and solve graphically. **[6]**

29. Find the probability distribution of the number of white balls drawn in a random draw of 3 balls without replacement from a bag containing 4 white and 6 red balls. Also find the mean and variance of the distribution. **[6]**