Session : 2021-2022

Math_XII | Sample Mock Paper Class 12th SA 2 (Paper 1)

Name : ..... **Date : 25-02-2022**

Time : 120 Mins **M.M. : 40**

General Instructions:

1. Question 1 to 6 Short answer type (SA1) questions of 2 Mark each.

2. Question 7 to 10 Short answer type (SA2) questions of 3 Mark each.

3. Question 11 to 14 Long answer type (LA) questions of 4 Mark each.

Q1	Evaluate $\int \frac{\sec x}{\log(\sec x + \tan x)}\,dx$	2
Q2	Evaluate $\int_0^1 x(1-x)^5\,dx$	2
Q3	Find the differential equation of all circles touching the y-axis at the origin.	2
Q4	Two coins are tossed once, Find $P(E/F)$ in each case where (i) E : tail appears on one coin, F : one coin shows head (ii) E : no tail appears, F : no head appears	2
Q5	Show that the line $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-4}{5}=\frac{y-1}{2}=z$ intersect. Find their point of intersection.	2
Q6	For any two vectors $\vec{a}$ and $\vec{b}$, show that : $(1+\lvert\vec{a}\rvert^2)\cdot(1+\lvert\vec{b}\rvert^2)=\{1-\vec{a}\cdot\vec{b}\}^2+\lvert\vec{a}+\vec{b}+(\vec{a}\times\vec{b})\rvert^2$.	2
Q7	Let $\vec{a}=\hat{i}+\hat{j}+\hat{k}, \vec{b}=4\hat{i}-2\hat{j}+3\hat{k}$ and $\vec{c}=\hat{i}-2\hat{j}+\hat{k}$. Find a vector of magnitude 6 units which is parallel to the vector $2\vec{a}-\vec{b}+3\vec{c}$.	3
Q8	Evaluate $\int \frac{\cos x}{\sin x+\sqrt{\sin x}}\,dx$	3
Q9	Evaluate: $\int_0^{1/2} \frac{dx}{(1+x^2)\sqrt{1-x^2}}$.	3
Q10	Sketch the curves and identify the region bounded by $x=\frac{1}{2}$, $x=2$, $y=\log_e x$ and $y=2^x$. Find the area of this region.	3
Q11	A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn at random and are found to both clubs. Find the probability of the lost card being of club?	4

Q12 Find the particular solution of the differential equation 4

$\frac{dx}{dy} + x\cot y = 2y + y^2 \cot y, (y \neq 0)$, given that $x = 0$ when $y = \frac{\pi}{2}$.

Q13 Find the equation of plane passing through the point $(-1, -1, 2)$ and perpendicular to each planes $2x + 3y - 3z = 2$ and $5x - 4y + z = 6$. 4

Q14 A company manufactures two types of screws *A* and *B*. All the screws have to pass through a threading machine and a slotting machine. A box of type *A* screws requires 2 min on the threading machine and 3 min on the slotting machine. A box of type *B* screws requires 8 min on the threading machine and 2 min on the slotting machine. In a week, each machine is a available for 60 h. On selling these screws, the company gets a profit of Rs. 100 per box on type *A* screws and Rs. 170 per box on type *B* screws. 4

Formulate this problem as a LPP given that the objective is to maximise profit.