DPP - 012

M.M.:30	**www.mathstudy.in**	Time : 40 Mints

1. The area of the region of the plane bounded above by the graph of $x^2+y^2+6x+8=0$ and below by the graph of $y=|x+3|$ is
   (a) $\pi/4$
   (b) $\pi^2/4$
   (c) $\pi/2$
   (d) π

2. Consider straight line ax+by=c where a,b,c $\in \mathbb{R}^+$ and a,b,c are distinct. This line meets the coordinate axes at P and Q respectively If area of $\triangle$ OPQ O being the origin does not depend upon a,b and c then
   (a) a,b,c are in G.P
   (b) a,c,b are in G.P
   (c) a,b,c are in A.P
   (d) a,c,b are in A.P

3. If x and y are real numbers and $x^2+y^2=1$ then the maximum value of $(x+y)^2$ is
   (a) 3
   (b) 2
   (c) 3/2
   (d) $\sqrt{5}$

4. The value of the definite integral $\int_0^\infty \frac{dx}{(1+x^a)(1+x^2)} (a>0)$ is
   (a) $\pi/4$
   (b) $\pi/2$
   (c) π
   (d) some function of a

5. Let a,b,c are non zero constant number then $\lim_{r\to\infty} \frac{cos(a/r)-cos(b/r)cos(c/r)}{sin(b/r)sin(c/r)}$ equals
   (a) $\frac{a^2+b^2-c^2}{2bc}$
   (b) $\frac{c^2+a^2-b^2}{2bc}$
   (c) $\frac{b^2+c^2-a^2}{2bc}$
   (d) independent of a,b and c

6. A curve y =f(x) such that $f''(x) = 4x$ at each point (x,y) on it and crosses the xaxis at (-2,0) at an angle of $\pi/4$ The value of f(1) is

   (a) -5
   (b) -15
   (c) -55/3
   (d) -35/3

7. The minimum value of the function $f(x) = \frac{sinx}{\sqrt{1-cos^2x}} + \frac{cosx}{\sqrt{1-sin^2x}} + \frac{tanx}{\sqrt{sec^2x-1}} + \frac{cotx}{\sqrt{cosec^2x-1}}$ as x varies over all number in the largest possible domain of f(x) is

   (a) 4
   (b) -2
   (c) 0
   (d) 2

8. A non zero polynomial with real coefficient has the property that $f(x) = f'(x).f''(x)$ The leading coefficient of f(x) is

   (a) 1/6
   (b) 1/9
   (c) 1/12
   (d) 1/18

9. Let $C_n = \int_{1/(n+1)}^{1/n} \frac{tan^{-1}(nx)}{sin^{-1}(nx)} dx$ then $\lim_{n\to\infty} n^2 C_n$ equals

   (a) 1
   (b) 0
   (c) -1
   (d) 1/2

10. Let z_1, z_2, z_3 be complex numbers such that $z_1 + z_2 + z_3 = 0$ and $|z_1| = |z_2||z_3| = 1$ then $z_1^2 + z_2^2 + z_3^2$ is

   (a) greater than zero
   (b) equal to 3
   (c) equal to zero
   (d) equal to 1