1. The area bounded in the first quadrant by the normal at $(1,2)$ on the curve $y^2 = 4x$, x-axis & the curve is given by :

(A) $\frac{10}{3}$ (B) $\frac{7}{3}$ (C) $\frac{4}{3}$ (D) $\frac{9}{2}$

2. Suppose $y = f(x)$ and $y = g(x)$ are two functions whose graphs intersect at the three points $(0, 4)$, $(2, 2)$ and $(4, 0)$ with $f(x) > g(x)$ for $0 < x < 2$ and $f(x) < g(x)$ for $2 < x < 4$. If $\int_0^4 [f(x) - g(x)]dx = 10$ and $\int_2^4 [g(x) - f(x)]dx = 5$, the area between two curves for $0 < x < 2$, is

(A) 5 (B) 10 (C) 15 (D) 20

3. Let 'a' be a positive constant number. Consider two curves $C_1 : y = e^x$, $C_2 : y = e^{a-x}$. Let S be the area of the part surrounding by C_1, C_2 and the y-axis, then $\lim_{a \to 0} \frac{S}{a^2}$ equals

(A) 4 (B) 1/2 (C) 0 (D) 1/4

4. The area of the region(s) enclosed by the curves $y = x^2$ and $y = \sqrt{|x|}$ is

(A) 1/3 (B) 2/3 (C) 1/6 (D) 1

5. Area enclosed by the graph of the function $y = ln^2 x - 1$ lying in the 4th quadrant is

(A) $\frac{2}{e}$ (B) $\frac{4}{e}$ (C) $2\left(e + \frac{1}{e}\right)$ (D) $4\left(e - \frac{1}{e}\right)$

6. The area bounded by the curve $y = f(x)$ (where $f(x) \geq 0$), the co-ordinate axes & the line $x = x_1$ is given by $x_1 \cdot e^{x_1}$. Therefore $f(x)$ equals :

(A) e^x (B) $x e^x$ (C) $xe^x - e^x$ (D) $x e^x + e^x$

7. The slope of the tangent to a curve $y = f(x)$ at $(x, f(x))$ is $2x + 1$. If the curve passes through the point $(1, 2)$ then the area of the region bounded by the curve, the x-axis and the line $x = 1$ is

(A) $\frac{5}{6}$ (B) $\frac{6}{5}$ (C) $\frac{1}{6}$ (D) 1

8. The area bounded by the curves $y = x(x-3)^2$ and $y = x$ is (in sq. units) :

(A) 28 (B) 32 (C) 4 (D) 8

9. Area of the region enclosed between the curves $x = y^2 - 1$ and $x = |y| \sqrt{1 - y^2}$ is

(A) 1 (B) 4/3 (C) 2/3 (D) 2

10. The curve $y = ax^2 + bx + c$ passes through the point $(1, 2)$ and its tangent at origin is the line $y = x$. The area bounded by the curve, the ordinate of the curve at minima and the tangent line is

(A) $\frac{1}{24}$ (B) $\frac{1}{12}$ (C) $\frac{1}{8}$ (D) $\frac{1}{6}$