Date Planned : __ / __ / __	Daily Tutorial Sheet - 7	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 1	Exact Duration :________

91. Let $f(x)$ be a function defined by $f(x)=\int_1^x x(x^2-3x+2)dx, 1\le x\le 3$. Then the range of $f(x)$ is :

(A) [0, 2] **(B)** $\left[-\frac{1}{4}, 4\right]$ **(C)** $\left[-\frac{1}{4}, 2\right]$ **(D)** None of these

92. The equation of the tangent to the curve $y=\int_{x^2}^{x^3}\frac{dt}{\sqrt{1+t^2}}$ at $x=1$ is :

(A) $\sqrt{2}y+1=x$ **(B)** $\sqrt{3}x+1=y$

(C) $\sqrt{3}x+1+\sqrt{3}=y$ **(D)** None of these

93. The value of $\int_0^{\sin^2 x}\sin^{-1}\sqrt{t}\,dt+\int_0^{\cos^2 x}\cos^{-1}\sqrt{t}\,dt$ is :

(A) 0 **(B)** $\frac{\pi}{4}$ **(C)** $\frac{\pi}{2}$ **(D)** None of these

94. $\int_{-1/2}^{1/2}\sqrt{\left(\frac{x+1}{x-1}\right)^2+\left(\frac{x-1}{x+1}\right)^2-2}\,dx$, equal to:

(A) $4\ell n\left(\frac{2}{3}\right)$ **(B)** $2\ell n\left(\frac{2}{3}\right)$ **(C)** $\ell n\left(\frac{4}{3}\right)$ **(D)** $4\ell n\left(\frac{4}{3}\right)$

95. Let $f(x)=ax^2+bx+c$, where $a\in R^+$ and $b^2-4ac<0$. Area bounded by $y=f(x)$, x-axis and the lines $x=0$, $x=1$, is equal to :

(A) $\frac{1}{6}(3f(1)+f(-1)+2f(0))$ **(B)** $\frac{1}{12}(5f(1)+f(-1)+8f(0))$

(C) $\frac{1}{6}(3f(1)-f(-1)+2f(0))$ **(D)** $\frac{1}{12}(5f(1)-f(-1)+8f(0))$

95. For $x\in R$ and a continuous function f, let $I_1=\int_{\sin^2 t}^{1+\cos^2 t}x\,f(x(2-x))dx$ and $I_2=\int_{\sin^2 t}^{1+\cos^2 t}f(x(2-x))dx$.

Then I_1/I_2 is:

(A) 0 **(B)** 1 **(C)** 2 **(D)** 3

97. $\int_{-2}^{2}\min(x-[x],-x-[-x])dx$ equals, where $[x]$ represents greatest integer less than or equal to x :

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

98. Area bounded by the curves $y = \tan x$, and $y = \tan^2 x$ in between $x \in \left(-\frac{\pi}{3}, \frac{\pi}{3}\right)$ is equal to :

(A) $\frac{1}{2}(\pi + \ln 2 - 2)$ sq. units **(B)** $\frac{1}{3}(\pi + \ln(2\sqrt{2} - 3))$ sq. units

(C) $\left(\frac{-\pi}{6} + \ln 2 + 2\sqrt{3} - 2\right)$ sq. units **(D)** $\frac{1}{2}(\pi + \ln 4 - 2)$ sq. units

99. The area of the loop of the curve $x^2 + (y-1)y^2 = 0$ is equal to:

(A) $8/15$ sq. units **(B)** $15/8$ sq. units **(C)** $4/15$ sq. units **(D)** None of these

100. The region bounded by the curves $x^2 = y, y = x + 2$ and x-axis has the area enclosed by them is:

(A) 1 **(B)** $\frac{5}{6}$ **(C)** $\frac{4}{7}$ **(D)** $\frac{5}{2}$

101. The area inside the parabola $5x^2 - y = 0$ but outside the parabola $2x^2 - y + 9 = 0$ is:

(A) $9\sqrt{3}$ **(B)** $8\sqrt{3}$ **(C)** $12\sqrt{3}$ **(D)** $2\sqrt{3}$

102. The area bounded by the x-axis; part of the curve $y = \left(1 + \frac{8}{x^2}\right)$ and the ordinates at $x = 2$ and $x = 4$. If the ordinate at $x = a$ divides the area into two parts, then the value of 'a' is:

(A) $\sqrt{2}$ **(B)** $3\sqrt{2}$ **(C)** $4\sqrt{2}$ **(D)** $2\sqrt{2}$

103. The area included between the parabolas $y^2 = 4a(x+a)$ and $y^2 = 4b(b-x)$ is:

(A) $\sqrt{ab}(a-b)$ **(B)** $\frac{8}{3}\sqrt{ab}(a+b)$ **(C)** $2\sqrt{ab}$ **(D)** None of these

104. Find the area bounded by the curve $y = 2x - x^2$ and the straight line $y = -x$.

(A) $\frac{1}{2}$ **(B)** $\frac{3}{2}$ **(C)** $\frac{9}{2}$ **(D)** None of these

105. If $y = \int_0^x \sqrt{\sin x}\, dx$ the value of $\frac{dy}{dx}$ at $x = \frac{\pi}{2}$ is:

(A) 0 **(B)** 1 **(C)** -1 **(D)** None of these