Date Planned : __ / __ / __	Daily Tutorial Sheet - 6	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 1	Exact Duration :________

76. If $f(y)=e^y$, $g(y)=y;\ y>0$ and $F(t)=\int_0^t f(t-y)g(y)dy$, then:

(A) $F(t)=1-e^{-1}(1+t)$ **(B)** $F(t)=e^t-(1+t)$ **(C)** $F(t)=te^t$ **(D)** $F(t)=te^{-t}$

77. $\lim_{x\to 0}\dfrac{\int_0^{x^2}(\tan^{-1}t)dt}{\int_0^{x^2}\sin\sqrt{t}\ dt}$ is equal to:

(A) 1 **(B)** -1 **(C)** $-1/2$ **(D)** 0

***78.** The point of extremum of $\int_0^{x^2}\dfrac{t^2-5t+4}{2+e^t}dt$ are:

(A) $x=-2$ **(B)** $x=1$ **(C)** $x=0$ **(D)** $x=-1$

***79.** Let $f(x)=\int_0^x |x-1|\,dx,\ x\ge 0$. Then $f'(x)$ is:

(A) continuous at $x=1$ **(B)** continuous at $x=2$
(C) differentiable $x=1$ **(D)** differentiable at $x=2$

80. If $x=\int_{c^2}^{\tan t}\tan^{-1}z\,dz$, $y=\int_n^{\sqrt{t}}\dfrac{\cos(z^2)}{z}dz$ then $\dfrac{dy}{dx}$ is equal to: (where c and n are constants):

(A) $\dfrac{\tan t}{2t}$ **(B)** $\dfrac{\cos^2 t}{t^2}$ **(C)** $\dfrac{\cos^3 t}{2t^2}$ **(D)** $\dfrac{\tan t^2}{2t^2}$

81. Show that area bounded by ellipse $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$ is πab.

82. Show that the area in the first quadrant, enclosed by the x-axis, the line $x=\sqrt{3}y$ and the circle $x^2+y^2=4$ is $\pi/3$.

83. Find the area bounded by the curves $x^2=4y$ and the straight line $x=4y-2$.

84. Find the area common to the parabola $x=-2y^2$ and $x=1-3y^2$.

85. Find the area bounded by the parabola $y=2-x^2$ and the straight line $y+x=0$.

86. Calculate the area enclosed by the parabola $y^2=x+3y$ and the Y-axis.

87. Prove that the area bounded by the parabolas $y^2=5x+6$ and $x^2=y$ is $81/15$.

88. Find the area of the portion of the circle $x^2+y^2=64$ which is exterior to the parabola $y^2=12x$.

89. AOB is the positive quadrant of the ellipse $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$ in which $OA=a$ and $OB=b$. Show that the area between the chord AB and the arc AB of the ellipse is $\dfrac{1}{4}ab(\pi-2)$:

90. Sketch the region bounded by the curves $y=x^2$ and $y=\dfrac{2}{1+x^2}$. Find the area.