Name: KEY	ID: KEY	Sec: 34(11:00-11:50) 23(1:10-2:00)

MATH-102 Term-132 Class-QUIZ-2

(show all your work and circle one letter to get a full mark or you will get zero)

1)

$$Let \int_{-2}^{x^4} \frac{2f(\sqrt{t})}{t^2}\,dt = x^2 - 1 \qquad \text{then } f'(2) =$$

(a) $1/\sqrt{2}$
(b) 0
(c) -2
(d) $1/(4\sqrt{2})$
(e) $-1/(4\sqrt{2})$
(f) none of the above

diff w.r.t x using Fund. Thm Calcu.

$$\frac{2f(\sqrt{x^4})}{(x^4)^2}(4x^3) = 2x \quad \boxed{4}$$

$$\Rightarrow \frac{2f(x^2)(4x^3)}{x^8} = 2x$$

$$\Rightarrow 8f(x^2)(x^3) = 2x^9 \Rightarrow f(x^2) = \frac{1}{4}x^6$$

~~let $x=\sqrt{2} \Rightarrow f(2)$~~ diff. w.r.t x

$$\boxed{3}\quad f'(x^2)(2x) = \frac{3}{2}x^5 \Rightarrow f'(x^2) = \frac{3}{4}x^4$$

let $x=\sqrt{2} \Rightarrow f'(2) = \frac{3}{4}(\sqrt{2})^4 = 3 \quad \boxed{3}$

2)

$$\text{If } F(2x) = e^{-x^2} - 5 + \int_0^{\sqrt{x}} 8te^{-t^4}\,dt \qquad \text{then } F'(w) = 0 \text{ when } w =$$

(a) 0
(b) 2
(c) 4
(d) -5
(e) -7
(f) none of the above

diff. w.r.t x using Fund. Th. of Cal.

$$F'(2x)(2) = (-2x)e^{-x^2} + 8\sqrt{x}\,e^{-x^2}\left(\frac{1}{2\sqrt{x}}\right) \quad \boxed{4}$$

$$F'(2x)(2) = -2xe^{-x^2} + 4e^{-x^2}$$

$$\Rightarrow F'(2x) = -xe^{-x^2} + 2e^{-x^2}$$

$$\Rightarrow F'(2x) = e^{-x^2}(-x+2) = 0 \quad \text{——} (*)$$

$\boxed{3}$

$$\Rightarrow x = 2$$

Hence at $x=2$ $(*)$ become

$$F'(4) = e^{-4}(-2+2) = 0 \quad \boxed{3}$$