KFUPM – Math 132– Test 3

Name : ..... **ID** #.....Serial #: .....

Question 1: Find the function $f(t)$ that satisfies

$$f''(t) = -12\sin(2t) - 4e^{2t}, \quad f(0) = 0, \quad f'(0) = -1.$$

Question 2: A farmer has 2400 ft of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fence along the river. What are the dimensions of the field that has the largest area?

Question 3: Evaluate the following integrals:

- $\int(\tan^2 x - 4\csc x \cot x)dx =$
- $\int_0^{\pi} \cos^2 x \; dx =$
- $\int_0^1 x\sqrt{1+3x} \; dx =$
- $\int x \ln x \; dx =$

Question 4: A circle has a radius of 10 meters, that is measured with an error of 2%. Use differentials to estimate the error in calculating its area.

Question 5: Find

- the area between $y = 1 - x^2$ and the $x-$axis.
- the area between $y = 2$ and $y = \sin x$, from $x = 0$ to $x = \pi$.