



PRINCE SULTAN UNIVERSITY

MATH 211

BUSINESS CALCULUS

MAJOR EXAM II

11TH DECEMBER 2010

Start : 4:30 PM

End: 6:00 PM.

Name: _____ I.D. _____

1. Answer all questions
2. This exam consists of 5 pages, 8 questions
3. You can use a calculator, NOT a mobile phone.
4. No talking during the test.
5. Show all working out in the space provided.

Question No.	Max. Points	Points Scored
1, 2, 3	15	
4, 5	12	
6	10	
7, 8	13	
TOTAL	50	

Q1. (5 points) At a certain factory, the daily output is $Q(K) = 600K^{0.5}$ units, where K denotes the capital investment measured in units of 1000 dollars. The current capital investment is \$900,000. Use calculus to estimate the effect that an additional capital investment of \$800 will have on the daily output.

Q2. (5points) A manufacturer of digital cameras estimates that when x cameras are produced, the total profit will be $P(x) = -0.0035x^3 + 0.07x^2 + 25x - 200$ hundred dollars.

a) Use marginal analysis to estimate the profit of producing the 11th camera.

b) Find the actual profit of producing the 11th camera.

Q3. (5points) Find the equation of the tangent line to the curve $x^2y^3 - 2xy = 6x + y + 1$ at the point $(0, -1)$.

Q4. (5 points) When the price of a certain commodity is p dollars per unit, the manufacturer is willing to supply x hundred units, where $3p^2 - x^2 = 12$. How fast is the supply changing when the price is \$4 per unit and is increasing at the rate of \$0.87 per month?

Q5. (7 points) Find the intervals of increasing and decreasing and the relative max. and min. points (if any) of the function
 $f(x) = (x^2 - 4x)^5$.

Q6. **(10 points)** Use calculus to sketch the graph of the function

$$f(x) = 2x^3 + 3x^2 - 36x - 44.$$

Q7. (7 points) An airline determines that when a round trip ticket between Riyadh and London costs p dollars ($0 \leq p \leq 160$), the daily demand for tickets is

$$q = 256 - 0.01p^2.$$

Determines the values of the price p for which the demand is elastic, inelastic and of unit elasticity.

Q8. (6 points) Find the absolute max and min of the function $f(x) = x^3 + 3x^2 + 1$ on the interval $-3 \leq x \leq 2$.