ALLAMA IQBAL OPEN UNIVERSITY

Level: **Bachelor**   Semester: Spring 2009
Paper: **Business Mathematics**   (135)   Maximum Marks: 100
Time Allowed: 3 hrs   Pass Marks: 40

Note: - **ATTEMPT FIVE QUESTIONS. ALL CARRY EQUAL MARKS.**

Q. 1	a) Two men are waiting for trains. Salman waits for 10 minutes, then impatiently gets on a local averaging 30 miles per hour. Ayaaz waits 30 minutes & gets on the express which averages 50 miles per hour. Both arrive at their destination at the same time. How long did it take the express to make the trip? How far did they travel?	10
	b) Out of 1000 students, 300 failed in the course of mathematics, 200 failed in English and 150 failed both mathematics and English. Find 　i)　How many failed English or failed mathematics 　ii)　How many failed in mathematics and did not fail English	10
Q. 2	a) Solve each equation:- 　(i)　$5 + x/5 = 7/5$　　(ii)　$3x/4 - 5x - 1/8 = \frac{1}{4}$	10
	b) Graph the function　$f(x) = 2x^2$	10
Q. 3	Four oranges, two lemons and one lime cost Rs.88. Three oranges and two limes cost Rs.62. An orange, a lemon and three limes cost Rs.55. Find the cost of an orange, the cost of a lemon and the cost of a lime.	20
Q. 4	AIOU has 300 employees classified as faculty, administration or staff. The number of faculty members is equal to the sum of the number of administration members and staff members. The number of staff members is 50 more than the number of administration members. Find the number of employees in each classification.	20
Q. 5	Maximize　　$P = 3X_1 + 2X_2$ Subject to　　$X_1 + X_2 \leq 4$ 　　　　　$3X_1 + 2X_2 \leq 9$ 　　　　　$X_1 \geq 0, \quad X_2 \geq 0$	20
Q. 6	a) A deposit of Rs. 500 is made to a bank at the end of each six months for 2 and a half years. If money is worth 8% interest compounded semiannually, make a table showing how much money accumulates in the sinking fund.	10
	b) Find the present value of Rs.35,000 due in five years, if money is worth 6% compounded quarterly.	10
Q. 7	a) A die is tossed three times. If the throws are assumed to be independent, what is the probability that, on the first throw, the die will show an even number; on the second throw, a number divisible by 3; and on the third throw, a 1?	10
	b) A nationwide promotion promises a first prize of Rs.25,000, two second prizes of Rs.5,000 and four third prizes of Rs.1,000. A total of Rs.950,000 persons enter the lottery. What is the expected value if the lottery costs nothing to enter?	10
Q. 8	(a) Lever brothers lists its Cost function as:- 　　$C(x) = 8x - 0.02x^2 - 500$ 　　(i)　Find the marginal cost function. 　　(ii)　Find the limit of the function when $x \rightarrow -4$	10
	(b) If the marginal profit function of Walls ice cream is 　　$MP = 600 - 4x$ 　　(i)　Find the total profit function. 　　(ii)　Assume there is a loss of Rs. 100 when no items are produced. Find the maximum profit.	10