

SVKM's NMIMS University
School of Distance Learning

Quantitative Analysis for Managerial Applications

Date: 12.12.2007
Time: 3.00 to 6.00

Marks: 100

- N.B.: (1) Solve any five questions
(2) Marks allotted to the questions are shown on r.h.s margin
(3) Make suitable assumptions, if required.
(4) Use of calculator is permitted

- Q.1 (a) Draw the graph $y = 4x - 10$ (06)
(b) Find out sum of the following A.P. upto 20 terms (08)
10, 7, 4
(c) Find compound interest after 3 years at the rate of 10% per annum for the sum of Rs. 15000. (06)

- Q.2 (a) Find out (06)

(i) Limit $t \rightarrow 0 \frac{\sqrt{t^2+9} - 3}{t^2}$

(ii) limit $x \rightarrow \infty \frac{3x^2 - x - 2}{5x^2 + 4x + 1}$

- (b) The total cost function is given by $c = 20x^3 + 4x^2 + 3x - 2$ where x represents the demand. (07)

Find the average cost and marginal cost when $x = 2$

- (c) The marginal revenue function is given by $MR = 2x^3 + 4x^2 + 5x + 6$ (07)
Where x is the quantity demanded. Find the total revenue function and also the demand function.

- Q.3 (a) Solve the following equations using Inverse Matrix algebra (12)

$$\begin{aligned}x + 4y + 9z &= 6 \\x + 2y + 3z &= 4 \\x + y + z &= 3\end{aligned}$$

(b) The profit (Rs. Lakhs) of 50 companies are given below:

(08)

20	12	15	27	28	40	42	35	37	43
55	65	53	62	29	64	69	36	25	18
56	55	43	35	26	21	48	43	50	67
14	23	34	59	68	22	41	42	43	52
60	26	26	37	49	53	40	20	18	17

Classify the above data taking first class as 10 – 20 and form a frequency distribution.

Q.4 (a) Calculate Mean and Mode for the following data:

(12)

Daily Sales (Rs. Thousand)	No. of firms	Daily Sales (Rs. Thousand)	No. of firms
20 – 30	15	60 – 70	35
30 – 40	23	70 – 80	25
40 – 50	27	80 – 90	3
50 – 60	30	90 – 100	2

Q.4 (b) Draw cumulative less than curve for the following data:

(08)

Monthly Salary (Rs. Thousand)	Nos. of Employees	Monthly Salary (Rs. Thousand)	Nos. of Employees
10 – 20	15	50 – 60	25
20 – 30	20	60 – 70	18
30 – 40	37	70 – 80	11
40 – 50	30	80 – 90	4

How many employees have salary less than Rs. 35000?

Q.5 (a) Calculate median and quartile deviation using following data:

(12)

Marks	No. of students	Marks	No. of students
0 – 10	5	50 – 60	13
10 – 20	8	60 – 70	8
20 – 30	12	70 – 80	7
30 – 40	14	80 – 90	6
40 – 50	22	90 – 100	5

Q.5 (b) Market prices of the shares of the two companies A and B are as follows recorded during last 10 months.

(08)

Company A's	115	40	30	45	65	25	20	10	35	15
Market price Rs.										
Company B's	55	40	60	65	55	45	50	55	40	55
Market price Rs.										

Which company's performance is consistent?

Q.6 (a) 4 coins are tossed. What is the probability that atleast two coins will show heads? (12)
No coin showing head?

(b) If $P(x=2) = P(x=3)$ (08)
Where P denotes probability and 'X' is a random variable following poisson distribution. Find out $P(X=1)$.

Q.7 (a) In a objective test question paper there are 10 questions and four alternative answer to each question; one of which is correct. Find out the probability of answering exactly 4 questions correctly, atleast 8 questions correctly and atmost 2 questions correctly. (10)

Q.7 (b) A power plant generates on an average 120 megawatt of power with standard deviation of 10 megawatt. If it can generate atmost 150 megawatts, what is the probability that it is overloaded at any time? (10)

Q.8 (a) Sales during last 7 years are as follows: Forecast sales during the period 2007 (10)

Year	2000	2001	2002	2003	2004	2005	2006
Sales in lakhs	5	8	10	9	12	14	15

Q.8 (b) A survey of 100 patients at a local hospital is conducted to determine whether there is connection between smoking and lung cancer. Contingency table is as follows: (10)

		Lung Cancer		Total
		Yes	No	
Smokes	Yes	15	25	40
	No	5	55	60
Total		20	80	

Use 5% level of significance.
