

**SVKM's NMIMS**  
**School of Distance Learning**

Programme: ADITM/ADSCM/PGDMM/PGDFM/PGDHRM/PGDITM/PGDSCM/PGDBFM/ADBFM

Academic year: 2011 – 2012

Semester: II / III

Subject: Quantitative Analysis for  
Managerial Applications

Course Old

Marks 70

Date: 04.01.2012

Time: 11.00 a.m. to 2.00 p.m.

**Instructions:**

Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer book, which is provided for their use. Figure in brackets indicates full marks.

**Answer any two questions out of question number (1), (2), (3), and (4) (10 Marks)**

Q.1. The total cost function is given by  $C=x^3 - 24x^2 + 189x+10$ . Find x for which the cost is minimum.

Q.2. Find the inverse of the matrix  $A = \begin{bmatrix} 3 & 2 & -4 \\ 1 & -1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$

Q.3. Mr. X repays a loan of Rs. 3250 by paying Rs. 20 in the first month and then increases the payment by Rs. 15 every month. How long will it take to clear his loan.

Q.4. Following data gives the grades of 3 students of a professor. Compare the performance of the three, using weighted average.

Heads	Marks of A	Marks of B	Marks of C	Weight
Home Assignment	85	78	82	15
Mid Term Exam.	87	91	84	30
Final Exam.	90	92	93	40

**Write Short Notes on any two out of five topics in Question No. 5 given below (10 Marks)**

- Q.5. (i) Relationship between Mean, Median and Mode.  
(ii) Random Variable and Probability distribution.  
(iii) Key issues in Decision Theory.  
(iv) Stratified Sampling Techniques.  
(v) Type I and Type II Errors in Testing of Hypothesis.

Attempt any three questions out of five Question No. (6), (7), (8), (9) and (10) (30 Marks)

Q.6. Calculate Spearman's rank Correlation Coefficient between advertisement costs (X) in thousand of Rs. and sales (Y) in lakhs of Rs.

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

Q.7. Fit a Regression Equation of y on x, using normal equations

x	3	5	7	9	11
y	9	12	16	14	15

Q.8. Fit a Straight line trend for the following time series

Year	2005	2006	2007	2008	2009	2010	2011
Profit (1000 Rs.)	300	700	600	800	900	700	1000

Q.9. Electric bulbs manufactured by X and Y companies gave the following results:

Electric bulbs	X Company	Y Company
Number of bulbs used	100	100
Mean Life in hours	1300	1248
Standard deviation in hours	82	93

Using Standard Error of the difference between means, state whether there is any significant difference in the mean life of the two makes at 5% level of significance.

Q.10. A certain drug was administered to 456 males out of a total 720 in a certain locality to test its efficiency against typhoid. The incidence of typhoid is shown below. Find out the effectiveness of the drug against the disease by using chi-square test.

Typhoid Cases	Infected	Not infected	Total
Administering the drug	144	312	456
Without administering the drug	192	72	264
<b>Total</b>	<b>336</b>	<b>384</b>	<b>720</b>

Given Chi-square table value at 1 degrees of freedom = 3.841 and at 2 degrees of freedom = 9.210

**Question Number (11.a) and (11.b) are both compulsory**

**(20 Marks)**

Q.11 a) Calculate Karl Pearson's co-efficient of correlation between height in cm (x) and income in Rs. (y), for 10 employees of a company, from the following

x	160	161	163	166	166	168	169	171	173	176
y	1800	1850	1900	1700	2100	2250	1800	1900	2200	2500

Q.11 b) Following are the runs scored by two batsmen A and B in 10 test matches. Use Coefficient of Variation and decide who should be selected for the coming England tour.

Runs by batsman A	32	28	47	63	71	39	10	60	96	14
Runs by batsman B	19	31	48	53	67	90	10	62	40	80

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