Registration No: | | | | | | | | | | |

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MBA
15MNG101

1st Semester Regular/Back Examination 2017-18
STATISTICS AND DECISION SCIENCE
BRANCH : MBA
Time: 3 Hours
Max Marks: 100
Q.CODE: B1160

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2x10)**

a) The quartiles of a normal distribution are 47.3 and 52.7 respectively, then mean deviation about mode is _____ and range is _____.

b) The mean and S.D. of a normal distribution are 10 and 6, the point of inflexion is _____ and coefficient of kurtosis is _____.

c) If r=0.6, then coefficient of non-determination is _____ and if r=±1 then two regression line are_____to each other.

d) Two variates x and y are given by y=2-3x, if variance of x is 9, then variance of y is _____ and _____ is a unitless measure of dispersion.

e) If each of the value x is divided by 2 and of y is multiplied by 2, then coded value b_{vu} is _____ times of byx and if m_2=4 and m_3=8 the skewness is _____.

f) In a simplex method the pivot (or key element) can be _____ sign and constraints involve equal sign require use of _____ variables.

g) Planning military strategy is an application of _____ and prediction of electoral behaviour in election is made by _____ analysis.

h) If in a game the payment are made from and among the players only then the game is called _____ and assignment problem is a particular case of _____.

i) If λ=10 customers per hour and μ = 15customers per hour then the traffic intensity is _____ and expected number of customers in queue is _____.

j) If anevent B has occurred and it is known that P(B)=1, then conditional probability P(A/B) is _____ and for a binominal distrution if n=6 and P (3):P(4)= 8:3, then value of p is _____.

Q2 **Answer the following questions:** **(2×10)**

a) If n=10, Σx_i = 110, $\Sigma(x_i - 5)^2$=1000, then find S.D of x.

b) If S.D of 'n' natural numbers is 2, then find value of 'n'.

c) What is Probability that two persons borne on the same day. (Ignoring date).

d) A coin and a dice are thrown. What is probability of getting a head or an even number?

e) The sum of 25 observations is 400 and the sum of squares of observations is 8900, find coefficient of variability.

f) A speaks truth is 75% and B is 80% of the cases are they likely to contradict each other narrating the same incident.

g) The regression coefficient of x on y is 0.6, write down the regression coefficient of u and v, where u+3x=10 and 2y+5v=25.

h) If λ=20 customers per hour and μ = 25customers per hour then find expected waiting time in system and in queue.

i) If Q_1=26, Q_3=76 and coefficient of Skewness=0.2, find median.

j) A pair of dice is thrown 3 times. If getting a doublet is considered as a success, find the probability of 3 successes.

Q3 Find optimal strategies for firm A, firm B and value of the game from the following pay-off matrix by using dominance rule. **(15)**

	Firm B			
Firm A	35	35	25	5
	30	20	15	0
	40	50	0	10
	55	60	10	15

Q4 Find B.F.S and T.C from the following T.P by NWCM and then test for optimality by 'MODI' method. **(15)**

Warehouse

Plant	W1	W2	W3	W4	Supply
P1	6	2	6	12	120
P2	4	4	2	4	200
P3	13	8	7	2	80
Demand	50	80	90	180	

Q5 **a)** A Sample of 100 arrivals of customers to a departmental store is according to the following distribution: **(9)**

Time between arrival (minutes)	1	1.5	2	2.5	3
Frequency	18	15	36	19	12

Simulate for next 10 time between arrivals and time of arrivals by using random numbers : 25,39,65,76,12,05,73,89,19,49.

b) Mean and S.D. of 100 observations are 40 and 5.1 respectively. By mistake, one observation is misprint as 50 against 40, then find corrected mean and S.D. **(6)**

Q6 **a)** The number of units of an item that are withdrawn from inventory on a day-to-day basis follows Markov process in which requirements for tomorrow depend on today's requirement. A one-day transition matrix is given below. **(9)**

Numbers of units withdrawn from inventory.

	Tomorrow		
	5	10	12
Today 5	0.6	0.4	0
10	0.3	0.3	0.4
12	0.1	0.3	0.6

Find two-day transition matrix by constructing probability tree diagrams.

b) A municipal corporation puts 10,000 light bulbs in the street. If lives of bulbs follow normal distribution with a mean of 60 days and a standard deviation of 20 days, then find how many bulbs will be replaced after 20 days? **(6)**

Q7 **a)** Time taken in minutes by workers for different jobs are given in the matrix. **(9)**

	Jobs				
Workers	1	2	3	4	5
A	2	9	2	7	1
B	6	8	7	6	1
C	4	6	5	3	1
D	4	2	7	3	1
E	5	3	9	5	1

Find optimal assignment schedule by HAM.

b) Two regression lines are given below. **(6)**
3x+2y=10 and 6x+y=15,
Find Correlation Coefficient.

Q8 **a)** Prove that -1$\leq r \leq$ 1 **(7)**
(r= correlation coefficient)

b) Write short note ;
a) Maximin Criterion. **(4)**
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