

Assign the programmers to applications in such a way that the total computer time is minimum. **6 Marks**

Q5. A furniture dealer deals in only tables and chairs. He has Rs. 5000 to invest and a space to store at most 60 items. A table costs him Rs. 250 and a chair Rs. 50. He can sell a table at a profit of Rs.50 and a chair at a profit of Rs. 15.

[a] Assuming that he can sell all the items that he buys, formulate a linear programming problem of the model. **4 Marks**

[b] Solve the problem using Graphical Method. **8 Marks**

Q6. [a] Explain the role of statistics in effective decision making by taking a suitable illustration from your own or any other organization. **6 Marks**

[b] Suggest different types of data and statistical measures which can be used by the Head of a University to monitor performance of the University. **6 Marks**

Q[7]. Write short notes on any two of the following: **6X2 = 12Marks**

- i. Different types of data with examples
- ii. Type I and Type II Errors in Hypothesis Testing
- iii. Applications of Chi Square Test
- iv. Role of Statistical Division in an organization

-END-

P.T.O.

Total No. of Pages 04

SEMESTER FIRST

SUPPLEMENTARY EXAMINATION

EMBA-105 QUANTITATIVE METHODS

Time: 3:00 Hours

Roll No. ....

EMBA

FEB-2019

Max. Marks: 60

Note: Attempt five questions in all. Section A is compulsory. Use of calculators is allowed. Assume suitable missing data, if any.

SECTION A

- i. You are required to write True/False, choose correct option(s) or solve or fill in the blanks. Each part is of 1 mark. **12 Marks**
  - i. The mean and variance of Bernoulli probability distribution function are same. (True/False)
  - ii. If  $P(A) = 0.3$ ,  $P(B) = 0.7$ ,  $P(A \cap B) = 0.2$ , find  $P(A \cup B)$ .
  - iii. The total area under the curve for a probability distribution function is equal to -----
  - iv. A random variable which follows Normal distribution can take values in the range -----
  - v. If X is normally distributed with mean 18 and standard deviation 2.5, find the value k such that  $P(X < k) = 0.5$
  - vi. The value of a fair game is zero. (True/False)
  - vii. In an LP problem, at least one corner points must be an optimal solution if an optimal solution exists. (True/False)
  - viii. A feasible solution to an LP problem may not be an optimal solution (True/False)
  - ix. If  $P(A) = 0.8$ ,  $P(B) = 0$ , what is  $P(A \cap B)$  given that A and B are independent events?
  - x. The mean and median of a random variable following Normal distribution are not same. (True/False)
  - xi. A random variable which follows Binomial probability function can have mean 8 and variance 10. (True/False)

1  
2  
1

P.T.O.

- xii. Assignment Problem is a special type of Linear Programming Problem (True/False)

**SECTION B**

Q2. [a] Write the purpose of Hypothesis Testing and the steps involved in Hypotheses Testing. **6 Marks**

[b] Two types of cars (say A and B) manufactured in India are tested for petrol mileage. A sample consisting of 36 cars of type A averaged 14 km per litre. Another sample consisting of 72 cars of type B averaged 12.5 km per litre. Assuming normal populations with respect to mileage and given that population variances are 1.5 and 2.0, test whether there exist a significant difference in the petrol consumption of these two types of cars. Use  $\alpha = 0.01$ . [Given  $P(z < 2.58 = 0.995)$  and  $P(z < 2.33 = 0.99)$ ] **6 Marks**

Q3. [a] A researcher randomly divides 24 students into 3 groups of 8. All students study the same chapter for 30 minutes. Group 1 students study with background sound at a constant volume in the background. Group 2 studies with noise that changes volume periodically. Group 3 studies with no sound at all. The students then take a 10 point multiple choice test on the chapter studied. Their scores are:

Constant Sound	Random Sound	No Sound
7	5	2
4	5	4
6	3	7
8	4	1
6	4	2
6	7	1
2	2	5
9	2	5

Test at 5% level of significance if there is a significant difference in the mean scores due different sound effects [Given approx. values:  $F(1, 21, .05) = 4.32$ ,  $F(2, 21, 0.05) = 3.44$ ,  $F(21, 1, 0.05) = 248$ ,  $F(21, 2, .05) = 19.4$ ]

**8 Marks**  
**P.T.O.**

- [b]. The observed data based on a 'Hotel Guest Satisfaction Survey' is as follows:

Choose Hotel Again?	HOTEL.		
	A	B	Total
Yes	163	154	317
No	64	108	172
Total	227	262	489

Test the hypothesis that population proportion of guests who would return to Hotel A equals the population proportion of guests who would return to Hotel B. (Given: Critical value of Chi-Square Distribution at 5% level of significance with 1, 2 and 4 degrees of freedom are respectively 3.841, 5.991 and 9.488) **4 Marks**

Q4. [a] Consider the following transportation problem involving three factories and three warehouses. The cell entries represent the cost of transportation per unit. Find the initial basic feasible solution using ANY method. **6 Marks**

		Warehouse			Supply
		W1	W2	W3	
FACTORY	F1	5	4	3	100
	F2	8	4	3	300
	F3	9	7	5	300
Demand		300	200	200	700

[b] A software project team has 3 programmers with different development capabilities. The project involved development of 3 applications. The Project Head estimates the computer time in minutes required by the programmers for the applications as follows:

		Programmers		
		A	B	C
Applications	1	120	100	80
	2	80	90	110
	3	110	140	120