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Name of the Candidate:

**M.B.A (GLOBAL) DEGREE EXAMINATION, 2011**

**(FIRST YEAR)**

**(PAPER-V)**

**150. QUANTITATIVE TECHNIQUES**

Dec.)

(Time: 3 Hours)

Maximum: 75 Marks

**SECTION-A**

(5×3=15)

Answer any FIVE questions  
All questions carry equal marks

1. What is operations research?
2. Define Statistics.
3. What is Secondary Data?
4. What are the drawbacks in observation methods?
5. Define the weighted arithmetic mean of a set of numbers.
6. What is a measure of dispersion?
7. What is time series analysis?
8. What is hypothesis?
9. Define Decision Theory.
10. What is Transportation Model?

**SECTION-B**

(3×10=30)

Answer any THREE questions  
All questions carry equal marks

11. Give the classical and statistical definitions of probability. What are the objectives raised in these definitions.
12. Obtain an expression for the variance of the order P may be expressed in terms of standard deviation of order (p-1) and a correlation co-efficient of order (p-1). Hence deduce that
  - i)  $s_1^2, s_{1,2}^2, s_{1,2,3}^2, \dots, s_{1,2,3,\dots,n}^2$
  - ii)  $1 - R_{2,1,2,3,\dots,n}^2 = (1 - r_{1,2}^2)(1 - r_{1,3,2}^2) \dots$   
 $(1 - r_{1,2,3,\dots,n}^2)$
13. Define Correlation Co-efficient and Correlation ratio. When is the later a more suitable measure of correlation than the former? Show that the correlation ratio is never less than

the correlation co-efficient. What do you infer if the two are equal? Further, show that none of these can exceed one.

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14. Explain the concept of most powerful test and discuss how the Neyman-Pearson lemma enables us to obtain the most powerful critical region for testing a simple hypothesis against a simple alternative.
15. The owner of a small machine shop has four mechanics available to assign jobs for a day. Five jobs are offered with expected profit, for each mechanic on each job which are as follows.

|          |   | Jobs |    |     |     |    |
|----------|---|------|----|-----|-----|----|
|          |   | A    | B  | C   | D   | E  |
| Mechanic | 1 | 62   | 78 | 50  | 111 | 82 |
|          | 2 | 71   | 84 | 61  | 73  | 59 |
|          | 3 | 87   | 92 | 111 | 71  | 81 |
|          | 4 | 48   | 64 | 87  | 77  | 80 |

Find by using the assignment method, the assignment of mechanics to the job that will result in a maximum profit. Which job should be declined?

**SECTION-C**

(2×15=30)

Answer any TWO questions

16. Solve the LPP using simplex method.

$$\text{Max } Z = 2x_1 + x_2$$

Subject to the constraints

$$4x_1 + 3x_2 \leq 12$$

$$4x_1 + x_2 \leq 8$$

$$4x_1 - x_2 \leq 8$$

$$\text{Where } x_1, x_2 \geq 0$$

17. Solve the transportation problem when the unit transportation costs, demands and supplies are as given below:

Destination

|        |                | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | supply |
|--------|----------------|----------------|----------------|----------------|----------------|--------|
| Origin | O <sub>1</sub> | 6              | 1              | 9              | 3              | 70     |
|        | O <sub>2</sub> | 11             | 5              | 2              | 8              | 55     |
|        | O <sub>3</sub> | 10             | 12             | 4              | 7              | 70     |
|        | Demand         | 85             | 35             | 50             | 45             |        |

18. Give a mathematical formulation of the assignment problem. Explain the nature of it in traveling Salesman problem and give its algorithm.

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