2023/06

SET A

MASTER OF COMMERCE
SECOND SEMESTER [REPEAT]
BUSINESS STATISTICS AND OPERATIONS RESEARCH
MCM – 201
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. We get an upward sloping line from left to right when correlation is
   a. Positive
   b. Negative
   c. Zero
   d. Indeterminate

2. The objective of network analysis is to_____
   a. minimize total project duration
   b. minimize total project cost
   c. minimize production delays, interruption and conflicts
   d. maximize total project duration

3. The error of accepting Null Hypothesis when it is true is known as
   a. Type II error
   b. Sampling error
   c. Type I error
   d. Non-sampling error

4. Which of the following is a problem in the construction of index number?
   a. Purpose of index number
   b. Selection of commodities
   c. Selection of base period
   d. All of the above

5. The cause and effect relationship between two variables can be estimated from
   a. Correlation
   b. Regression
   c. Both
   d. None of the above

6. Which of the following is inherent in every time series?
   a. Secular trend
   b. Seasonal variation
   c. Cyclical variation
   d. Random variation

7. The data which is available from already collected sources is called
   a. Raw data
   b. Primary data
   c. Secondary data
   d. None of the above

8. _____ is a mathematical technique used to solve the problem of allocating limited resource among the competing activities
   a. Linear Programming problem
   b. Assignment Problem
   c. Replacement Problem
   d. Non linear Programming Problem

9. In order to be a better representative of the population, the sample size must be
   a. Small
   b. Large
   c. Zero
   d. None of the above

10. If the calculated value of a test statistic is larger than the tabular value, the null hypothesis should be
    a. Accepted
    b. Rejected
    c. Indeterminate
    d. Both (b) and (d)

11. Operations Research approach is_____
    a. Multi-disciplinary
    b. Intuitive
    c. Scientific
    d. Collect essential data

12. A feasible solution to a linear programming problem _____
    a. must satisfy all the constraints of the problem simultaneously
    b. need not satisfy all of the constraints, only some of them
    c. must be a corner point of the feasible region
    d. must optimize the value of the objective function

13. Service mechanism in a queuing system is characterized by
    a. customers behavior
    b. servers behavior
    c. customers in the system
    d. server in the system

14. Managerial decisions are based on
    a. An evaluation of quantitative data
    b. The use of qualitative factors
    c. Results generated by formal models
    d. All of the above.

15. _____ is a mathematical technique used to solve the problem of allocating limited resource among the competing activities
    a. Replacement Problem
    b. Assignment Problem
    c. Linear Programming problem
    d. Non linear Programming Problem

16. Network models have advantage in terms of project
    a. Planning
    b. Scheduling
    c. Controlling
    d. All of the above

17. The difference between total float and head event slack is
    a. free float
    b. independent float
    c. interference float
    d. linear float

18. The quantitative approach to decision analysis is a-
    a. Logical approach
    b. Rational approach
    c. Scientific approach
    d. All of the above

19. The mathematical model of an LP problem is important because
    a. It helps in converting the verbal description and numerical data into mathematical expression
    b. Decision-makers prefer to work with formal models
    c. It captures the relevant relationship among decision factors
    d. It enables the use of algebraic technique

20. Which of the following is an assumption of an LP model?
    a. Divisibility
    b. Proportionality
    c. Additivity
    d. All of the above

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Descriptive

Time : 2 Hr. 30 Mins. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. What are the different sources of data collection? Explain all primary sources of data collection. 4+6=10

2. What is an index number? Explain the steps involved in the construction of an index number. 5+5=10

3. Distinguish between 5+5=10
   a)census and sample
   b) sampling and non-sampling errors

4. a) Calculate Karl Pearson's correlation coefficient for the given data. 8+2=10

X	39	65	62	90	82	75	25	98	36	78
Y	47	53	58	86	62	68	60	91	51	84

   b) Discuss the basis of probability sampling.

5. a) What are the uses of index numbers? 5+5=10
   b) Discuss the problems in the construction of index.

6. A small project is composed of activities whose time estimates are listed in the table- 5+5=10

Activity (i-j)	Optimistic time(o)	Most likely time(m)	Pessimistic time(p)
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

   a) Draw the project network.
   b) Find the expected duration and variance of each activity.

7. Explain three models of Operation Research. Describe the first five steps of methodology of Operations Research 5+5=10

8. From the data given below find: 5+5=10
   i) The two regression coefficients.
   ii) The two regression equations.

Marks in Economics	25	28	35	32	31	36	29	38	34	32
Marks in Statistics	43	46	49	41	36	32	31	30	33	39

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