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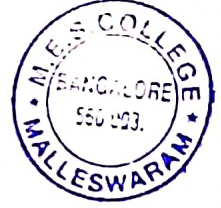
VI Semester B.Sc. Degree Examination, September/October - 2022

STATISTICS - VII

Applied Statistics

(CBCS Scheme 2018 [F+R] 2020-21 and Onwards)

Paper : P-7



Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

- i. Answer any **FIVE** questions from section - A and **FIVE** questions from Section - B.
- ii. Scientific calculator is allowed.

SECTION - A**I. Answer any FIVE of the following questions.****(5×5=25)**

1. What is Time Series? Explain the components of a Time Series.
2. Explain the methods of finding trend by fitting a straight line.
3. Define the following index numbers and discuss their merits and demerits.
 - i. Laspeyre's index number.
 - ii. Paasche's index number.
 - iii. Fisher's ideal index number.
4. What are the cost of living index numbers? Write the procedure involved in the construction of them.
5. Explain the registration method of obtaining vital statistics and mention its uses.
6. Explain the terms :
 - i. Mortality.
 - ii. Fertility.
 - iii. Fecundity.
 - iv. IMR.
 - v. Neonatal Mortality Rate (NMR).
7. Describe the development of statistical system in India during pre - independent era and post independent era.
8. Mention the activities of CSO.

[P.T.O.]



SECTION - B

II. Answer any five of the following questions. (5×9=45)

9. a. Explain the method of measuring trend by least square principle and illustrate the procedure using a second degree trend equation.
b. Describe the method of measuring seasonal indices by ratio to moving average method. (5+4)
10. a. Explain Time and Factor reversal Tests. Show that Fisher's index number satisfies both the tests.
b. Discuss uses and limitations of index numbers. (5+4)
11. a. Explain various fertility rates.
b. Explain gross reproduction rate (GRR) and net reproduction rate (NRR). Interpret the case when $GRR = NRR$ and $GRR > NRR$. (4+5)
12. a. What is a life table? Discuss the components of a life table.
b. Define force of mortality and central mortality with usual notations show that :
i. $P_x = \frac{2 - m_x}{2 + m_x}$ and
ii. $m_x = \frac{2q_x}{2 - q_x}$ (5+4)
13. a. Distinguish between :
i. Prospective and retrospective studies.
ii. Sensitivity and specificity.
b. Explain with interpretation :
i. Intelligent quotient (I.Q).
ii. Body mass index (B.M.I).
iii. Relative risk (R.R). (6+3)
14. a. What is Receiver Operating characteristics (ROC) curve? Explain construction and use of ROC curve.
b. Define odds ratio and interpret it. Write 99% confidence interval for the odds ratio. (5+4)
15. a. Explain organisation and function of NSSO.
b. Write the short notes about the following :
i. Gross national product (GNP).
ii. Gross domestic product (GDP).
iii. Per capita income. (4+5)
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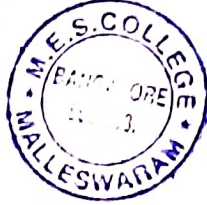


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VI Semester B.Sc. Degree Examination, September/October - 2022
STATISTICS - VIII
Operations Research
(CBCS Scheme 2018 Freshers and Repeaters 2020-21 and Onwards)
Paper : P-8

**Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates:**

- i. Answer any **Five** questions from section - A and **Five** questions from Section - B.
- ii. Scientific calculators are allowed.

SECTION - A**I. Answer Five questions from the following. (5×5=25)**

1. Define operations Research (OR). Describe various types of OR models.
2. In a linear programming problem (LPP) define the terms :
 - i. Basic feasible solution.
 - ii. Multiple solution.
 - iii. In feasible solution.
 - iv. Unbounded solution.
3. Explain North - West corner Rule (NWCR) to determine initial basic feasible solution of a transportation problem (TP).
4. What is a game problem? Explain the following terms with reference to a game problem.
 - i. Two person zero sum game.
 - ii. Strategy.
 - iii. Pay - off.
 - iv. Saddle point.
5. What is meant by inventory? Explain the various costs associated with an inventory problem.
6. What is meant by replacement policy? Explain the need for replacement.
7. a. Define traffic intensity.
b. Distinguish between steady and transient states of a queueing system.
8. Describe the queueing model M/M/1 : (∞ , FCFS). Also derive expressions for average expected waiting time of a customer in the system (w_s) and in the queue (w_q).

[P.T.O.]



SECTION - B

II. Answer any Five questions.

(5×9=45)

9. a. Explain the methods of solving OR models Express. (5+4)
b. Explain the graphical method of solving an LPP.
10. a. Convert the following LPP into canonical and standard form.
Max $z = 2x_1 + 5x_3$
s.t $x_1 + x_2 \geq 2$
 $2x_1 + x_2 + 6x_3 \leq 6$
and $x_1, x_2, x_3 \geq 0$
b. Write the steps involved in solving an LPP by simplex method. (3+6)
11. a. What are artificial variables? Give examples.
b. What is the significance of duality theory of linear programming? Describe the general rules for writing the dual of an LPP. (3+6)
12. a. Explain Vogel's approximation method of finding initial basic feasible solution (IBFS) to a TP.
b. Explain various steps involved in finding an optimal solution to a TP. (4+5)
13. a. Distinguish between TP and Assignment problem (AP). Show that AP is a particular case of a TP.
b. What is unbalanced AP? Explain the method of solving such problems. (5+4)
14. a. Explain the characteristics of a game problem.
b. Explain the graphical method of solving (2×n) game. (3+6)
15. a. What is an EOQ models? Derive an expression for the minimum cost of maintaining an inventory without shortages for an EOQ model.
b. Explain individual and group replacement policies. (5+4)
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