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M 14401



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Name:

Fourth Semester M.Sc. Degree Examination, April 2008

STATISTICS

Paper 4.1 : Advanced Operations Research

Time : 3 Hours

Max. Marks : 70

- Instructions : 1) Answer any five questions, choosing one from each Unit.
 2) All questions carry equal marks.

UNIT - I

1. a) Discuss the role of unimodality in the elimination techniques. Explain methods of unrestricted search with fixed step size. The relationship $1/w, x, y, b, \lambda, \mu$ is $y = b - b_1 x$
 b) Explain the exhaustive search method. Find the maximum of the function $f = x(1.5 - x)$ in the interval (0.0, 1.00) within 10% of the exact value. $\epsilon = 0.1$

OR

2. a) Mention the various limitations of fibonacci method and explain the procedure.
 b) Distinguish between random jumping and random walk methods for finding a minimum point.

UNIT - II

3. a) Explain the chance constrained programming technique to solve a stochastic linear programming problem.
 b) Define an integer programming problem. Explain the role of constructing Gomory's constraints and fractional cut method to solve an all integer problem.

OR

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4. a) Solve the following IPP

$$\text{Maximize } Z = 2x_1 + 3x_2$$

Subject to the constraints

$$-3x_1 + 7x_2 \leq 14, 7x_1 - 3x_2 \leq 14$$

$$x_1, x_2 \geq 0 \text{ and are integers}$$

- b) What is geometric programming ? Explain how it differs from other optimization techniques and define the degree of difficulty in it.

UNIT - III

5. a) Explain the following terms in inventory theory :
- Lead time
 - Re-order point
 - Buffer stock
- b) Explain the difference between a periodic review system and a continuous review system . Is one better than the other ? Why or why not ? Explain.

OR

6. a) Discuss the continuous case of a probabilistic inventory model with instantaneous demand and no set-up cost.
- b) Explain S-S policy.

UNIT - IV

7. a) Define : i) survivor function, ii) failure rate and mean residual life function. Obtain the relationship among them.
- b) Describe the gamma and lognormal models in the context of survival analysis.

OR



8. a) Distinguish between censoring and truncation. What do you understand by "loss to follow up" ? Define random censoring.
- b) Derive the Green woods formula for the variance of the estimates of the survival function.

UNIT - V

9. a) Discuss the importance of two parameter exponential in survival analysis. Derive its point and interval estimates of the parameters when the data is Type II censored.
- b) Obtain likelihood ratio statistic for testing $H_0 : \beta = \beta_0$ v/s $H_1 : \beta \neq \beta_0$ for a Type I censored one parameter exponential model.

OR

10. a) Obtain the likelihood ratio statistic for testing $H_0 : \beta = \beta_0$ v/s $H_1 : \beta \neq \beta_0$ for the Weibull model with Type I censored data.
 - b) Derive the inference procedure for estimating parameters of a gamma distribution with Type I and Type II censoring.
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