

**C 44086**

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**Name**

**Reg. No.....**

**SECOND SEMESTER M.Sc. DEGREE EXAMINATION, AUGUST 2013**

(CUCSS)

Computer Science

CSC 2E 08—NUMERICAL AND STATISTICAL METHODS

Time : Three Hours

Maximum : 36 Weightage

I. Answer *all* questions :

- 1 What is an absolute error ?
- 2 What are iterative methods ?
- 3 Define non-linear equations.
- 4 Give Gauss Jacobi's formula.
- 5 Define Interpolation.
- 6 What are divided differences ?
- 7 What is a differential equation ?
- 8 Define Integration.
- 9 State multiplication law of probability.
- 10 State theorem on total probability.
- 11 When do you stop Simplex iterations ?
- 12 How do you detect multiple optimal solutions in graphical method ?

(12 x 1 = 12 weightage)

II. Answer any *six* questions :-

- 13 How does one-model an error ? Explain.
- 14 Define linear and non-linear equations.
- 15 How does one check the stability of equation ?
- 16 Discuss the convergence criteria of Gauss Elimination.
- 17 Discuss the importance and need for interpolation.
- 18 Discuss the applications of differential equations.
- 19 Assume the mean heights of soldiers to be 68 inches with a variance of 10 inches. How many soldiers in a regiment of 2000 would you expect to be at least 72 inches tall ? (Assume heights to be normally distributed).

**Turn over**

20 A shipment of 100 tape recorders contains 25 defective. If 10 are randomly chosen, What is the probability that 2 are defective ? (Use Poisson distribution)

21 Solve using Graphical method,

$$\text{Maximise } Z = 6x - 2y$$

$$\text{such that } 2x - y \leq 2,$$

$$x \leq 4,$$

$$x, y \geq 0.$$

(6 x 2 = 12 weightage)

III. Answer any *three* questions :

22 Explain Bisection method in detail.

23 Discuss Gauss Jordan method.

24 Solve using Lagrange's formula.

$x$	$-1$	$0$	$1$	$3$
$y$	$-6$	$-2$	$2$	$10$

25 Find  $y$  (O. 5) for  $dy/dx = x + y$ , at  $y(0) = 1$  with  $h = 0.25$ .

26 Use Dual Simplex method to solve,

$$\text{Minimise } Z = 3x + 2y$$

$$\text{such that } x - y \leq 1,$$

$$x + y \geq 3,$$

$$\text{and } x, y \geq 0.$$

27 (a) Given that the switch board of a consultant's office receives on an average of 0.6 calls per minute. Find the probability that

(i) In a given minute, there will be at least 1 call.

(ii) In a 4 minute interval, there will be almost 3 calls.

(b) Find the mean and variance of exponential distribution.

(3 x 4 = 12 weightage)