C 17242

(Pages : 2)

Name ....

Reg. No...............

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, AUGUST 2006

Computer Science (Elective)

CS 205 D—NUMERICAL AND STATISTICAL METHODS

(2005 admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any **five** *of the following.*
Each question carries **8** *marks.*

1. Explain with example :
   (i) Errors.
   (ii) Normalization.
   (iii) Stability of equations.
   (iv) Accuracy and Precision.

2. Discuss Direct and Indirect methods. Hence develop a computational model for the False Position methods.

3. What is pivotization ? How does it help in the convergence of solutions in linear equations ? Explain with an example.

4. Derive Adams-Bashforth-Moulton formula for finding the solution to a given differential equation.

5. (a) Define an experiment. Find its sample space. Identify two mutually exclusive events and two independent events. Verify any one law of probability. (3 marks)

   (b) State Bayes theorem. Three factories A, B, C produce 1,000, 4,000, 5,000 parts of which 20, 40, 50 are defective. All the parts are put in one stock pile. One is selected at random and found to be defective. What is the probability that it is from A ? (5 marks)

6. (a) Given that the switch of a consultant's office receives on the average 0.6 calls / min. find the probabilities that :
   (i) in a given min., there will be at least one call.
   (ii) in a 4 min. interval, there will be at least 3 calls. (4 marks)

   (b) A random variable X has a probability function $f(x) = k * x * x$ in (0, 3) and 0 elsewhere :
   (i) Find k.
   (ii) Find P $(1 < X < 2)$.
   (iii) Find the distribution function of X. (4 marks)

7. Draw sketches to show infeasible, multi-optimal solutions in an LPP.

[5 x 8 = 40 marks]

Turn over

Part B

Answer **any four** *of the following.*
Each question carries 10 marks.

C. Use appropriate formula to find the value of Y at = 2.75 and 4 = 4.75 for the data given below

X :	2.5	3.0	3.5	4.0	4.5	5.0
Y :	4.32	4.83	5.27	5.47	6.20	6.79

9. Derive Simpson's $1/3^{rd}$ rule formula and hence solve the integral

$$\int_{-2}^{+2} tdt \quad \text{with } h = 0.5$$

10. Solve the following equations by Gauss Jacobi method correct to 3 decimal places :-

$$2x - y + 2z = 6$$
$$2x - y + z = 3$$
$$x + 3y - z = 4$$

11. Frame the duel of Max. $Z = -5x + 2y$ such that -2 and $2x + 3y$ g 5 given that x, y ≥
Find the solution of either one of the problem and infer the solution of the other.

12. In the following transportation problem, find the initial basic feasible solution using any meth, and later find the optimal solution.

Plant	Destination 1	2	3	4	Availability
1	19	30	50	10	7
2	70	30	40	60	9
3	40	8	70	20	18
Requirements	5	8	7	14	

13. (a) A lot of IC chips contain 1 % defective. Each is tested before delivery. Tester is not tots' reliable. P (Tester says Good / Chip is bad) = 0.05, p (Tester says bad / Chip is good) = If a tested device is defective, find the probability that it is so ?

(4 marks)

(b) A machine produces bolts which are 10 % defective. Find the probability that in a random sample of 400 bolts produced by this machine :

(i) Atmost 30.

(ii) Between 30 to 50

will be defective. *Use* Poisson and Normal distribution for computation.

(6 marks)

[4 x 10 = 40 marks]