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Unit - V

5. a) Explain

   i) Null hypothesis.

   ii) Level of significance

  b) Explain the following terms:

   i) Standard error

   ii) Testing of hypothesis

  c) A machine which produces mica insulating washers of use in electric device is set to turn out washers having a thickness of 10 mils (1 mil = 0.001 inch). A sample of 10 washers has an average thickness of 9.52 mils with a standard deviation of 0.60 mil. Find out t.

  d) Two independent samples of 8 and 7 items respectively had the following values of the variables:

Sample I:	9	11	13	11	15	9	12	14
Sample II:	10	12	10	14	9	8	10	

Do the estimates of population variance differ significantly? Given that for 7 and 6 degrees of freedom the values of F at 5% level of significance is 4.20 approximately.

OR

A machine puts out 20 imperfect articles in a sample of 400. After the maximum overhauled puts out 10 imperfect articles in a batch of 300. Has the machine been improved?

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Total No. of Questions : 5]   [Total No. of Printed Pages : 4

Roll No ....

MCA-204

MCA. II Semester

Examination, December 2016

Computer Oriented Numerical and Statistical Methods

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

   ii) All parts of each question are to be attempted at one place.

   iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

   iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What do you understand by Normalized floating point numbers?

  b) Explain Bisection method for solving Algebraic and Transcendental equations.

  c) The solution of a problem is given as 4.635. It is known that absolute error in the solution is less than 0.01. Find the interval, within which the exact value must lie.

  d) Find a Real Root of the equation

$$xe^x = \cos x$$

Correct to three decimal places by the method of false position.

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OR

Find the approximate value of the real root of $x \log_{10} x - 1.2 = 0$ correct to three decimal places by Newton-Raphson method.

Unit - II

2. a) Show that

$$\Delta \nabla = (\Delta - \nabla)$$

b) Explain

i) Interpolation

ii) Extrapolation

iii) Inverse interpolation

c) Find the first term of the series whose second and subsequent terms are 8, 3, 0, –10.

d) From the following table find the value of tan 33° by Lagrange's formula.

x:	tan 30°	tan 32°	tan 35°	tan 38°
y:	0.5774	0.6249	0.7002	0.7813

OR

Find the value of $\int\limits_{3}^{5} \dfrac{4}{\left(2+x^2\right)} dx$ by simplex $\dfrac{1}{3}$ rule by dividing the range into eight equal parts.

Unit - III

3. a) Explain about ill conditioned equations.

b) Write a short note on partial and complete pivoting.

c) Explain Euler's method for the solution of differential equations.

d) Solve the following system of equations using Gauss-Seidel method.

$$28x + 4y - z = 32$$

$$x + 3y + 10z = 24$$

$$2x + 17y + 4z = 35$$

OR

Given $\dfrac{dy}{dx} = -2xy^2$ with $y(0) = 1$. Find $y(1.0)$ by taking $h = 0.5$, using Runge-Kutta method.

Unit - IV

4. a) Is the statement the mean and variance of Binomial Distributions are 6 and 9 respectively true?

b) Explain the rectangular distribution.

c) Find the probability that at most 5 defective fuses will be found in a box of 200 fuses, if experience shows that 2 percent of such fuses are defective.

d) Fit a normal distribution to the following data:

Mid point :	100	95	90	85	80	75	70	65	60	55	50	45
Frequency :	0	1	3	2	7	12	10	9	5	3	2	0

OR

Five dice were thrown 192 times and the number of time 4, 5 or 6 were as follows.

Number of dice throwing 4, 5 or 6 :	5	4	3	2	1	0
f :	6	46	70	48	20	2

Calculate χ^2