

[4]

In a sample of 1000 cases. The mean of a certain test is 14 and standard deviation is 2.5 . Assuming the distribution to be normal, find.

- i) How many students score between 12 and 15.
- ii) How many score above 18?
- iii) How many score below 8?
- iv) How many score 16?

5. a) Write the condition for CHI - SQUARE TEST.
- b) What is Null Hypothesis ( $H_0$ ) and write the types of error.
- c) A cubical die was thrown 9,000 times and 1 or 6 was obtained 3120 times. Can the deviation from expected value lie due to fluctuations of sampling?
- d) A sample of 6 persons of in an office revealed an average daily smoking of 10,12, 8, 9, 16, 5 cigarettes. The average level of smoking in the whole office has to be estimated at 90% level of confidence.

OR

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

Sample 1: 9 11 13 11 15 9 12 14

Sample 2: 10 12 10 14 09 08 10

Is the difference between means of the sample significant?

Given for  $V = 13$ ,  $t_{0.05} = 2.16$ .

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Total No. of Questions :5]

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**MCA-204****M.C.A. II Semester**

Examination, June 2015

**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 questions 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.

1. a) Find the truncation error for  $e^x$  at  $x = \frac{1}{5}$  if first three terms are retained in expansion.
- b) Find the absolute, relative and percentage errors if  $x$  is rounded off to three decimal digits. Given  $x = 0.005998$ .
- c) Find the positive root of  $x - \cos x = 0$  by bisection method up to five steps.
- d) Write the condition for the convergence of an iteration method and solve  $e^x = 3^x$  by it.

OR

Write the criteria for the convergence of Newton - Raphson method and find the formula to find the reciprocal of a given number N and hence find the value of  $1/19$ .

2. a) Find the missing term of the sequence.

x :	1	2	3	4	5	6	7
y :	2	4	8	-	32	64	128

- b) From the following data, find  $\theta$  at  $x = 43$

x :	40	50	60	70	80	90
y :	184	204	226	250	276	304

- c) Given the following table find  $y(35)$  by using strings's formula.

x :	20	30	40	50
y :	512	439	346	243

- d) State and prove Newton cat's formula and find  $\int_0^6 \frac{dx}{1+x^2}$  [www.rgpvonline.com](http://www.rgpvonline.com)

by using Simpson's  $1/3$  rule and  $3/8^{\text{th}}$  rule and check the results by actual integration.

OR

Find the age corresponding to the annuity value 13.6 and 32 given from the table.

Age (x):	30	35	40	45	50
Annuity value:	15.9	14.9	14.1	13.3	12.5

3. a) Solve the system of equations by Gauss elimination method.

$$x+2y+z = 3, 2x+3y+3z = 10, 3x-y+2z = 13$$

- b) Using Euler's method, solve numerically the equation.

$Y' = x+y$ ,  $y(0) = 1$ , for  $x = 0.0$  (0.2) (1.0) check your answer with the exact solution.

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- c) Solve, by Gauss - Seidel method, the following system.  
 $28x+4y-z = 32$ ,  $x+3y+10z = 24$ ,  $2x+17y+4z = 35$

- d) Solve  $\frac{dy}{dx} = x+y$  given  $y(0) = 1$ . Obtain the value of  $y(0.1)$ ,  $y(0.2)$  using Picard's method and check your answer with the exact solution.

OR

Compare  $y(0.3)$  given  $\frac{dy}{dx} + y + xy^2 = 0$ ,  $y(0) = 1$  by taking  $h = 0.1$  using R.K method of fourth order (correct to 4 decimals)

4. a) The overall percentage of failures in a certain examination is 20. If six candidates appear in the examination, what is the probability that at least five pass the examination.

- b) If the variance of the poisson distribution is 2. Find the probability for  $r = 1, 2, 3, 4$  from the recurrence relation of the Poisson distribution. Also find  $P(r \geq 4)$ .

- c) Ten individual are chosen at random from a population and their heights are found to be in inches 63, 63, 64, 65, 66, 69, 69, 70, 70, 71. Discuss the suggestion that the mean height of universe is 65. For 9 degree of freedom  $t$  at 5% level of significance 2.262.

- d) Fit a normal curve to the following data:

Length of line: 8.60 8.59 8.58 8.57 8.56

Frequency: 2 3 4 9 10

Length of line: 8.55 8.54 8.53 8.52

Frequency: 8 4 1 1

OR