c) The theory predict that the proposition of beans in 4 groups A, B, C, D should 9:3:3:1 in an experiment with 1600 beans the no's in the 4-group were 882, 313, 287, 118? Does the experimental result support the theory? (Chi-Square tab for 3- degree of freedom at 5% level of significance Till)

Printed Pages : 6

NBC401

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 294401

Roll No.

MCA-DUAL DEGREE
(SEM. IV) THEORY EXAM. 2014-15
COMPUTER BASED NUMERICAL
& STATISTICAL TECHNIQUES

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions as indicted.

Q 1. Attempt any *four* parts of the following : 5x4=20

a) Perform four iterations of the Regula-Falsi method to obtain the smallest positive root of the equation $x^3 - 3x + 1 = 0$.

b) Define error. Explain inherent, rounding off, trunactional error.

c) Explain the difference between Bisection method and Regula Falsi method.

d) Find the real root of the equation $x^3 - 2x - 5 = 0$ by using any method that performs seven iteration.

e) Write the algorithm for Newtons Raphson.

f) Solve $x^3 - 5x + 3 = 0$ by Secant method that perform five iterations.

Q 2. Attempt any *four* parts of the following :   5x4=20

a) Find y=27.5, using Bessel's formulae on the basis of given value

X	25	26	27	28	29	30
Y	4.000	3.846	3.704	3.571	3.448	3.333

b) Solve by Langrage's formulae $f(x) = 9$

X	4	6	8	10
Y	200	512	986	786

c) If the true value is 37.46325 and approximate value = 37.4632, find absolute, relative, percentage error.

b) Fit the curve $y = ax^b$ to the following data using least square method

x	1	2	3	4	5	6
y	2.98	4.26	5.21	6.1	6.8	7.5

c) Write shorts note on :

I. Forecasting

II. Time series Analysis

Q 5. Attempt any *two* parts of the following :   10x2=20

a) 300-digit where choose at random form a set of tables. The frequency of digit are

digit	0	1	2	3	4	5	6	7	8	9
freq	28	29	33	31	26	35	32	30	31	25

Using Chi-Square test access the hypothesis that the digit where distributive in equal numbers in the table. The 5% value of Chi-Square at 9 digit of is 16.92.

b) Explain Chi-Square test How to find Chi-Square all steps?

Q 3. Attempt any *two* parts of the following : 10x2=20

a) Solve by Newton Backward x=4.25

X	2.5	3.00	3.5	4.0	4.5
Y	9.75	12.45	15.46	19.52	23.75

b) Explain Bisection method. Solve $x^3 - x - 4 = 0$ perform eleven iteration by Regula - Falsi Method.

c) Using Runge-Kutta method of fourth order, find 0.8 correct to 4 decimal places if $y' = y - x^2$ y (0.6)=1.7379 taking h=0.1.

Q 4. Attempt any *two* parts of the following : 10x2=20

a) The velocity v of a particle at distance S from point on its path is given by the table below. Estimate the time taken to travel 60m by using Weddle's 1/3 rule

S in meter	0	10	20	30	40	50	60
V m/sec	47	58	64	65	61	52	38

d) The solution of a problem is 35.25 with relative error at most 2%. Find the range in which exact value must lie correct to 4 decimal digits.

e) Solve the following equations by using Gauss - Siedal iteration method

   (i) $27x + 6y - z = 85$

   (ii) $6x + 15y + 2z = 72$

   (iii) $x + y + 54z = 110$

f) Solve the following equations by Gauss - Jordan iteration method

   (i) $10x + y + z = 12$

   (ii) $x + 10y + z = 12$

   (iii) $x + y + 10z = 12$