



SE-8294

B. E. III (Sem. V) (I.T.) Examination
MaySE-8294 / June - 2011
Computer Oriented Statistical Methods

Time : 3 Hours]

[Total Marks : 100

Instruction :

नीचे दर्शाविले निशानीवाणी विगतो उत्तरवही पर अवश्य लपवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. 3 (Sem. 5) (I.T.)

Name of the Subject :
Computer Oriented Statistical Methods

Subject Code No. : **8** **2** **9** **4** Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

Q.1(a) Do as directed:

(10)

- (1) Round off the number 263450 to four significant figures and then compute absolute error and relative error.
- (2) Define Data Errors and Round off Errors
- (3) Define Interpolation
- (4) Define Numerical Differentiation
- (5) Define Significant Digits.

Q.1(b) Do as directed :

(08)

- (1) Write a short note on Finite Differences.
- (2) Using False Position method, find a real root of the equation
 $3x - \cos x - 1 = 0$

Q.2 Attempt the following questions (any TWO)

(16)

- (1) Derive the Formula for Trapezoidal rule for solving Numerical integration.
- (2) Apply Lagrange's formula to find $f(15)$, if

x :	10	12	14	16	18	20
F(x):	2420	1942	1497	1109	790	540

- (3) Explain the Graeffe's root squaring method with example.

Q.3 (a) Find $y(5.4)$ from the following table

(08)

x :	5	6	7	8	9	10	11
y :	16.25	18.43	19.84	20.70	21.15	21.24	20.98

OR

Q.3 (a) Solve the following equation by successive approximation method
 $5x = \sin x + 2$

(08)

Q.3 (b) Using Simpson's 1/3 rule, Evaluate the integral

(08)

$$\int_{1.0}^{1.8} \frac{e^x + e^{-x}}{2} dx$$

Q.4 Answer the following questions :

(10)

- 1) State the difference between Gauss Jacobi and Gauss Seidel methods.
- 2) Solve the system by Gauss-Elimination method
 $2x + 3y - z = 5$; $4x + 4y - 3z = 3$ and $2x - 3y + 2z = 2$.
- 3) Write True/False for the following:
 - a. The Euler's method can be described as a technique of developing a piecewise linear approximation. _____
 - b. Gauss Seidel method is one of the reduction methods. _____
- 4) Compute $y(0.5)$ for the differential equation $dy/dx = y^2 - x^2$, $y(0) = 1$ using Euler's method.
- 5) Solve by Taylor's method: $dy/dx = y - 2x/y$, $y(0) = 1$. Also compute $y(0.1)$

Q:5 Answer the following :

(20)

- 1) Solve the following system of equations by Gauss-Jacobi method. (08)
 $20x + y - 2z = 17$
 $3x + 20y - z = -18$
 $2x - 3y + 20z = 25$
- 2) Given $dy/dx = xy$, $y(1) = 5$. Using fourth order Runge-Kutta method find the solution in the interval (1,1.5) using step size $h=0.1$ (08)
- 3) Using Milne's Predictor-Corrector formula, find the solution of $dy/dx = (x+y)/2$ at $x=2$ given that $y(0)=2$, $y(0.5)=2.636$, $y(1)=3.595$, $y(1.5)=4.968$ (04)

OR

- 2) Solve the following system of equations by Jacobi's method up to 3 significant decimal digits. (08)

$$\begin{aligned} 8x - y + 2z &= 13 \\ x - 10y + 3z &= 17 \\ 3x + 2y + 12z &= 25 \end{aligned}$$

- 3) Using Adam's Predictor-corrector formula solve the following differential equation (04)
at $x=2$, $dy/dx = (xy)/2$, given $y(0)=1$, $y(0.1)=1.01$, $y(0.2)=1.022$, $y(0.3)=1.023$

Q.6 Answer the following

(20)

- 1) Find the Co-efficient of Correlation between height of father and height of son (08)
from the following data

Height of Father: 65, 66, 67, 67, 68, 69, 71, 73
Height Of Son : 67, 68, 64, 68, 72, 70, 69, 70

OR

- 1) Obtain Spearman's rank correlation coefficient from the following data. **(08)**
 X : 97.8, 99.2, 98.8, 98.3, 98.4, 96.7, 97.1
 Y : 73.2, 85.8, 78.9, 75.8, 77.2, 81.2, 83.8
- 2) Calculate seasonal indices for each quarter from the following percentage of wholesale price indices to their moving averages. **(08)**

Quarter

Year	I	II	III	IV
1993	--	--	11.0	11.0
1994	12.5	13.5	15.5	14.5
1995	16.8	15.2	13.1	15.3
1996	11.2	11.0	12.4	13.2
1997	10.58	13.3	--	--

- 3) Write a shortnote on Moments. **(04)**
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