

S.D.E.

B.C.A. (2004 COURSE SEM- II : SUMMER - 2018

SUBJECT : NUMERICAL METHODS

Day : Friday  
Date : 08/06/2018

S-2018-4349

Time 10.00 AM TO 1.00 PM  
Max. Marks : 80

N.B.

- 1) Attempt any FIVE questions from Section – I and any TWO questions from Section – II .
- 2) Figures to the right indicate FULL marks.
- 3) Answers to both the sections should be written in SEPARATE answer book.

SECTION – I

- Q.1 a) Explain the concept of significant digits. (05)  
b) Explain Errors in Numerical approximation . (05)
- Q.2 Use Gauss's elimination method to solve the following (10)  
 $2x + y + z = 10$   
 $3x + 2y + 3z = 18$   
 $x + 4y + 9z = 16$
- Q.3 Use Newton-Raphson's method to solve the following problem (10)  
 $x^5 + 5x + 1 = 0$
- Q.4 Use Gauss Seidel method to solve the following problem (10)  
 $27x + 6y - z = 85$   
 $6x + 15y + 2z = 72$  .  
 $x + y + 54z = 110$
- Q.5 Use the method of least squares to fit the straight line  $y = ax + b$  to the (10)  
following data
- |   |   |   |   |    |
|---|---|---|---|----|
| x | 0 | 1 | 2 | 3  |
| y | 2 | 5 | 8 | 11 |
- Q.6 Using Lagrange's interpolation formula, find  $f(5)$  gives that  $f(1) = 2$  , (10)  
 $f(2) = 4$ ,  $f(3) = 8$ ,  $f(14) = 16$  and  $f(17) = 128$ .
- Q.7 Write short notes on: (10)  
a) Regula Falsi method  
b) Interpolation Technique

SECTION – II

- Q.8 Evaluate  $\int_0^6 \frac{dx}{1+x^2}$  by using i) Trapezoidal rule ii) Simpson's  $\frac{1}{3}$  rule. (15)
- Q.9 Using Euler's method, solve in three steps  $\frac{dy}{dx} = x + y$  given  $y_0 = 0$  with (15)  
 $h = 0.2$  .
- Q.10 Given  $\frac{dy}{dx} = \frac{1}{x+y}$  for  $x = 0.5$  use Runge-Kutta method with  $x_0 = 0$ ,  $y(x_0) = 1$  (15)  
taking  $h = 0.5$  .

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