328451 (28)

BE (4th Semester)

Examination, Nov.-Dec., 2021

Branch : Et & T

NUMERICAL ANALYSIS USING C (NEW)

Time Allowed : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) is compulsory and attempt any two parts from (b), (c) and (d) in each unit.

Unit-I

Q. 1. (a) What is the maximum length allowed in defining a variable in C ? 2

(b) Explain the basic structure of C program and its all components with suitable example. 7

(c) Relationship between Celsius and Fahrenheit is governed by the formula : $F = \frac{9C}{5} + 32$ 7

Write a program to convert temperature :

(i) From Celsius to Fahrenheit

(ii) From Fahrenheit to Celsius

(d) Write a program to calculate the number of days and week in a year. 7

Unit-II

Q. 2. (a) What is function prototype ? 2

(b) Explain the various loop control structures with examples. 7

(c) Write a program to add two matrix of size m × n. 7

(d) Explain call by value and call by reference with suitable example. 7

Unit-III

Q. 3. (a) What would be the equivalent pointer expression for referring the element a[i] [j] [k] [ℓ] ? 2

(b) Explain pointers with example. Also write a program to swap two integer numbers using pointer. 7

(c) Write a 'C' program to check whether a string is a palindrome or not using a user defined function. 7

(d) What do you mean by STRUCTURE ? Write the differences between 'structure' and 'array'. 7

Unit-IV

Q. 4. (a) In Regula-Falsi method, the first approximation is given by 2

(b) Find the real positive root of $3x - \cos x - 1 = 0$ by Newton-Raphson method correct to six decimal places. 7

(c) Find a real root of the equation $x^3 - 11x^2 + 32x - 22 = 0$ by Birge-Vieta method correct to four decimal places using the initial approximation p = 0.5. 7

(d) Apply Gauss-Seidal method to solve the system of equations : 7

$8x - 3y + 2z = 20$

$4x + 11y - z = 33$

$6x + 3y + 12z = 35$

Unit-V

Q. 5. (a) Only write the Taylor's series for solving $\frac{dy}{dx} = f(x, y), y(x_0) = y_0$. 2

(b) Given that $y = \log x$ and : 7

x :	4.0	4.2	4.4	4.6	4.8	5.0	5.2
y :	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6487

Evaluate $I = \int_4^{5.2} \log_e x \, dx$ by :

(i) Trapezoidal rule

(ii) Simpson's $\frac{1}{3}$rd rule

(iii) Simpson's $\frac{3}{8}$th rule

(iv) Weddle's rule

(v) Compare it with exact value

(c) Find by Runge-Kutta method an approximate value of y for $x = 0.8$, given that $y(0.4) = 0.41$ and $\frac{dy}{dx} = \sqrt{x+y}$ (taking $h = 0.2$). 7

(d) Determine the value of $y(0.4)$ by using Milne's method. Given $y' = xy + y^2$, $y(0) = 1$, $y(0.1) = 1.1169$, $y(0.2) = 1.2773$, $y(0.3) = 1.5049$. **7**