Printed Pages : 4

Roll No. .....

320555(20)

BE (5th Semester)
Examination, Nov.-Dec., 2018
(New Scheme)

Numerical Methods & Computer Programming

Time Allowed : 3 hours | *Maximum Marks :* 80
Minimum Pass Marks : 28

Note : (*i*) Attempt **all** questions. Part (*a*) is compulsory. Attempt any two parts from (*b*), (*c*) and (*d*). Draw suitable diagram.
(*ii*) The figures in the right-hand margin indicate marks.

Unit-I

1. (*a*) Write a C++ program to print maximum of two numbers. [2]

(*b*) Explain (any **two**) with example : [7]
(*i*) if-else loop
(*ii*) for loop
(*iii*) do-while loop
(*iv*) while loop

(*c*) Explain different operators used in C++. [7]

(*d*) Write a program to perform arithmetic operation of two integer numbers given by user. [7]

Unit-II

2. (*a*) What do you mean by array? [2]

(*b*) Explain different function calling mechanisms. [7]

(*c*) Write a program to perform addition of two 3 × 3 matrices. [7]

(*d*) Explain the following with example : [7]
(*i*) 1-D array
(*ii*) 2-D array

Unit-III

3. (*a*) What is the use of initgraph ( ) in graphics function? [2]

(*b*) Write a short note on civil engineering applications of graphics programming. [7]

(*c*) Explain (any **three**) : [7]
(*i*) cleardevice ( )
(*ii*) getdrivername ( )
(*iii*) closegraph ( )
(*iv*) detectgraph ( )

(*d*) Explain the purpose of the following functions with syntax (any two) : [7]

(*i*) rectangle ( )

(*ii*) circle ( )

(*iii*) line ( )

Unit-IV

4. (*a*) Write the normal equation of the curve $y = ae^{bx}$. [2]

(*b*) The pressure and volume of a gas are related by the equation $PV^{\lambda} = k$, λ and k being constants. Fit this equation to the following set of observations: [7]

P (kg/cm^2) :	0.5	1.0	1.5	2.0	2.5	3.0
V (litres) :	1.62	1.00	0.75	0.62	0.52	0.46

(*c*) Apply Gauss-Jordan method to solve the equations

$$x + y + z = 9$$
$$2x - 3y + 4z = 13$$
$$3x + 4y + 5z = 40$$ [7]

(*d*) Solve the equations

$$2x + y + z = 10$$
$$3x + 2y + 3z = 18$$
$$x + 4y + 9z = 16$$

by Gauss-elimination method. [7]

Unit-V

5. (*a*) Prove $E = e^{hD}$. [2]

(*b*) Given that—

x :	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y :	7.989	8.403	8.781	9.129	9.451	9.750	10.031

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.1$. [7]

(*c*) Apply Runge-Kutta method to find an approximate value of y when $x = 0.2$.

Given that $\frac{dy}{dx} = x + y$ and $y(0) = 1$. [7]

(*d*) Given $\frac{dy}{dx} = \frac{(1+x^2)y^2}{2}$ and $y(0) = 1$, $y(0.1) = 1.06$, $y(0.2) = 1.12$, $y(0.3) = 1.21$

Evaluate $y(0.4)$ by Milne's predictor-corrector method. [7]

»–»–»