

**S.Y. B. SC. (COMPUTER SCIENCE) SEM -III (CBCS - 2016
COURSE) : SUMMER - 2018**

SUBJECT: COMPUTER ORIENTED NUMERICAL MENTHODS

Day : **Saturday**
Date : **21/04/2018**

S-2018-0813

Time: **03.00 PM TO 06.00 PM**
Max. Marks: 60

N. B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non programmable **CALCULATOR** is allowed.

Q.1 Attempt any **TWO** of the following: **(12)**

- a) State and prove Lagrange's interpolation formula.
- b) From the following data find the number of students who obtained less than 45 marks.

Marks	30-40	40-50	50-60	60-70	70-80
No. of Student	31	42	51	35	31

- c) Solve $x^5 + 5x + 1 = 0$ between $x = -1$ and $x = 0$ by Netwon-Rapson method.

Q.2 Attempt any **TWO** of the following: **(12)**

- a) Use method of least square to fit the straight line $y = a + bx$ to the data

x	0	1	2	3
y	2	5	8	11

- b) Evaluate $\int_0^1 x^2 dx$ by Simpson's $\frac{1}{3}rd$ rule (Take $h=0.1$)

- c) Compute $\int_1^2 \frac{dx}{x}$ using Trapezoidal rule for $h=0.25$

Q.3 Attempt any **TWO** of the following: **(12)**

- a) A small maintenance project had 10 activities. Their interdependence is describe below:

A is the first and J is the last activity. I is successor to F. C and D are successors to B. d precedes G. E and F occur after C. E precedes F. C restrains the occurrence of G and G precedes H. H precedes I. F restrains the occurrence of H. J succeeds I. B succeeds A. Draw neat network and number the events.

- b) Find the root of the equation $x^3 - 9x + 1 = 0$ between $x = 2$ and $x = 4$
- c) Find a real root of $x^3 - 5x + 3 = 0$ by using Regular-Falsi method up to 4 decimal places.

P.T.O.

Q.4 Attempt any **THREE** of the following: (12)

- a) Explain drawing network with example.
- b) Solve $\frac{dy}{dx} = 1 - y$; $y(0) = 0$ Find $y(0.3)$ using Euler's method
- c) Use the Runge-Kutta fourth order formula, to find the value of y when $x=1$.
- d) Show that $\delta^2 \equiv \Delta - \nabla$

Q.5 Attempt any **FOUR** of the following: (12)

- a) Write advantages of network analysis.
- b) Locate the interval to find root of $x^3 - 18 = 0$
- c) Construct difference table for following data:

x	10	20	30
<i>F(x)</i>	2.714	2.478	2.012

- d) Write down Newton's forward difference and Newton's Backward difference formula.
- e) Define: Δ, ∇ and δ
- f) Using Lagrange's interpolation find $p(1.5)$ such that $p(1) = 1$, $p(3) = 27$, $p(4) = 64$

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