

S.Y.B.SC. (COMPUTER SCIENCE) SEM –III (2014 COURSE) :
WINTER - 2017

SUBJECT: COMPUTER ORIENTED NUMERICAL METHODS

Day: Tuesday
Date: 31/10/2017

W-2017-0746

Time: 12.00 NOON TO 02.00 PM
Max Marks: 40

N.B:

- 1) All questions are **COMPULSORY**.
- 1) Figures to the right indicate **FULL** marks.
- 2) Draw neat and labeled diagram **WHEREVER** necessary.

Q.1 Attempt any **TWO** of the following: **(10)**

- a) Solve the equation $x^3 - 2x - 5 = 0$ by Regula Falsi method to obtain a root lying in the interval (2, 3).
- b) Find the cube root of 10 by Netoton Raphson method (correct up to 4 decimal places)
- c) What do you mean by a dummy activity? Why it is used in networking?

Q.2 Attempt any **TWO** of the following: **(10)**

- a) Establish following identities
i) $\mu = \frac{1}{2} (E^{1/2} + E^{-1/2})$ ii) $\Delta = \nabla E = \delta E^{1/2}$
- b) Using the following table find the form of the function f(x).

x	0	1	2	3	4
f(x)	3	6	11	18	27

- c) Find the value f(8) by using lagrange's interpolation formula given that
 $f(6) = 1.556, f(7) = 1.690, f(9) = 1.908, f(12) = 2.158.$

Q.3 Attempt any **TWO** of the following: **(10)**

- a) Use Simpon's (3/8)th rule to find $\int_0^6 \frac{4x}{(1+x)^2} dx, h = 1$
- b) Use Runge – Kutta second order formula to find y (0.2), given that
 $\frac{dy}{dx} = 1 + y^2, y(0) = 0, h = 0.2$
- c) Obtain y(x) by using Taylor's series method
 $\frac{dy}{dx} = x - y^2, y(0) = 1, h = 0.1.$ Hence obtain y(0.1).

Q.4 Attempt any **FIVE** of the following: **(10)**

- a) Explain Total Float.
- b) Define free float in CPM.
- c) Construct forward difference table for following data:

x	0.20	0.22	0.24	0.26
F(x)	1.6596	1.6698	1.6804	1.6912

- d) Write the formula for Simpson's (3/8)th rule.
- e) Write the general formula for fourth order Runge- Kutta method.
- f) Find location of root of function $f(x) = x^3 - 4x + 1 = 0.$
- g) Write Euler's formula.