

## POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year: 2020

Program: BE

Full Marks: 70

Course: Simulation and Modeling

Pass Marks: 31.5

Time: 2 hrs.

*Candidates are required to answer in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

### Group - A: (5×10=50)

- Q. N. 1 Why simulation is better option for the study of the System? Justify “Simulation is termed as The Last Resort”. Monte Carlo Method is used for deterministic bodies. Justify with example. 2+3+5
- Q. N. 2 Write down the significance of differential equations. Explain the analog computer model of liver with necessary equations and diagrams. 4+6

**OR**

Design an analog computer of following: 6+4

$$d^3x/dt^3 + a(d^2x/dt^2) + by = 100 \dots\dots\dots(i)$$

$$d^2y/dt^2 + c(dy/dt) + dz = 20 \dots\dots\dots(ii)$$

$$dz/dt = ax + cy - dz \dots\dots\dots(iii)$$

Where a & b = first two digits of your symbol number and c & d = last two digits of your symbol number.

Also, Explain the components used in above design.

- Q. N. 3 Differentiate between Static Mathematical Model and Dynamic Mathematical model with suitable examples. 10
- Q. N. 4 Compare and contrast lost and busy call of simulation of telephone call. Among these lost call and busy call, which one is best? Justify with example. 10
- Q. N. 5 Compare and contrast simulation run statistics and replication of run. 5+5

### Group - B: (1×20=20)

- Q. N. 6 a) There are 48 people in an institute studying programming. They all started writing a program at the same time. It takes each student  $15 \pm 3$  minutes to the program. Only 35% of the program will run correctly for the first time. When the program has an error it takes  $4 \pm 2.5$  minutes to do the debugging. After debugging only 35% of the program will run successfully. How long does it take for whole class to finish every one's program correctly? Simulate the given program with block diagram and GPSS code. 10
- b) What is the difference between the Kolmogorov Smirnov test and the chi-squared test? At what situation these two tests are used? Explain with example. 10