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University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE, BACHELOR OF SCINCE IN INFORMATION TECHNOLOGY

CCS 3301: SYSTEM PROGRAMMING

DATE: DECEMBER 2024 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **ONE** (Compulsory) and any other **TWO** questions*

QUESTION ONE (30 MARKS)

a) Describe the role of operating system in each stage of process life cycle (6 marks)

b) Explain the following terms from inter process communication

i. Semaphore (3 marks)

ii. Signal (3 marks)

iii. Dynamic link libraries (3 marks)

iv. Pipe (3 marks)

c) Give function prototype to perform the following tasks, discuss each parameter used in each case.

i. Create a shared memory (6 marks)

ii. Attach to a shared memory

d) Describe how client processes communicate with server process using socket mechanism. Outline specific functions on client and on server side. (6 marks)

QUESTION TWO (20 MARKS)

a) Explain the role of file system in a computer (3 marks)

b) Briefly illustrate how user program access system information by writing a program to list all process running in a computer, disabling and enabling highlighted process. (8 marks)

c) Briefly outline process involved in remote procedure call (RPC). Discuss any implementation of RPC in modern system. (9marks)

QUESTION THREE (20 MARKS)

a) Discuss any three features of run time environments such as dot net. (6 marks)

b) Briefly explain how file mechanism are sued in process communication. (6 marks)

c) Briefly describe sequence of step required to establish communication between a single server and several clients. (8 marks)

QUESTION FOUR (20 MARKS)

a) Differentiate between the following (6 marks)

i. Partitioning and segmentation

ii. Process and thread

iii. Device file and file API

b) Briefly explain how process accessing same resources are coordinating using signals (6 marks)

c) Write a program that create a file named "student.txt" and write to it several students personal data. Write another program that read and display content of student. Txt file in a list box or rich text box. (8 marks)

QUESTION FIVE (20 MARKS)

a) State and explain parameters when calling socket () function (6 marks)

b) Differentiate between double buffered IO and circular buffered IO (6 marks)

c) Write a program that create a client socket in one widow form and sever socket on different form. Write program that enable client socket to send some data to server to server socket (8 marks)