# NATIONAL OPEN UNIVERSITY OF NIGERIA
# 14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
# MARCH/APRIL 2016 EXAMINATION

## SCHOOL OF SCIENCE AND TECHNOLOGY

***COURSE CODE:*** **CIT752**
***COURSE TITLE:*** **Operating Systems Concept**

***TIME:*** **3 HOURS**
**Course Credit Unit: 2**
***Instruction:*** **Answer question 5 (FIVE) each question carry 14 marks**

1a)What is scheduling? (2 marks)
b) Briefly describe any three types of scheduling (8 marks)
c) Enumerate the specific tasksperform by process scheduler stating the mechanism responsible for each task? (4 marks)

2a) As a process executes, it changes state. State and describe these various states. Use a diagram to illustrate your answer. (7 marks)
b) State and describe any seven content of the process control block (PCB) (7 marks)

3a)Briefly explain the following concepts:
- ***i)*** Independent processes ***(1½ marks)***
- ***ii)*** Co-operating processes ***(1½ marks)***

b) State and explain reasons for providing an environment that allows process co-operation (6 marks)
c)State five benefits of threads(5 marks)

4a)Briefly discuss the following scheduling policies:
- ***i)*** First-In, First-Out (FIFO) **(3 marks)**
- ***ii)*** Shortest Process Next (SPN) **(2½ *marks)***
- ***iii)*** Round Robin (RR) **(2½ *marks)***

b) Enumerate the issues for cooperating processes (6 marks)

5) Let A, B C, D and E be processes with arrival times and service times as depicted in the table below. (Note that the time is in seconds).

| **Process** | A | B | C | D | E |
|---|---|---|---|---|---|
| **Arrival time** | 0 | 2 | 4 | 6 | 8 |
| **Service time** | 3 | 6 | 4 | 5 | 2 |

***a)*** Draw a chart and a table illustrating their execution for FIFO, RR (q=1) and SPN. In the chart show the start time and the finish time for each process under each technique. ***(4 marks)***

***b)*** Draw a table to show the finish time, waiting time, average waiting time for each process under each technique. ***(9 marks)***

***c)*** What is the least average waiting time that a process will spend before leaving the system and which of these policies gives the least average waiting time for a process? ***(1 mark)***

6a) Briefly discuss three file access methods stating one advantage and one disadvantage of each method. ***(9 marks)***

b) Briefly describe Programmed I/O technique **(2½ *marks)***

**c)** State the drawbacks of Programmed I/O technique and the technique that overcomes all these drawbacks**(2½ *marks)***

7a) What do you understand by Inter-Process Communication (IPC)? ***(2 marks)***

b) Briefly describe the following communication types stating properties of a communication link in each scheme.

***i)*** Direct communication **(3½ *marks)***

***ii)*** Indirect communication **(4½ *marks)***

c) List and describe the necessary and sufficient conditions for deadlock to occur in concurrent process management ***(4 marks)***