BAYERO UNIVERSITY, KANO

FACULTY OF COMPUTING

DEPARTMENT COMPUTER SCIENCE

2020/2021 – Second Semester Examinations

CSC2210 – Operating Systems

Instruction: Answer any four (5) questions. **Time Allowed: 2 Hours**

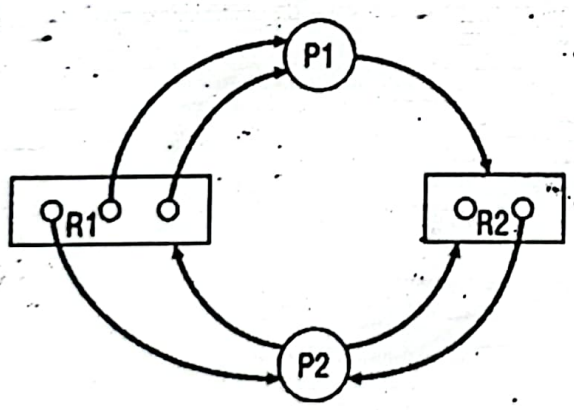
1. **a)** Define Operating Systems *(3 marks)*
   b) Briefly explain the main goals of the operating systems. *(7 marks)*
   c) Briefly describe any three (3) of the following types of Operating Systems
      i. Batch processing
      ii. Multiprogramming
      iii. Time-sharing
      iv. Real-time,
      v. Distributed operating systems *(7.5 marks)*

2. **a)** Explain briefly the responsibilities of the *Memory Manager*. *(3.5 marks)*
   b) Describe how any two (2) of the following memory allocations work. State the major problems in each case.
      i. Single-User Contiguous Scheme *(5 marks)*
      ii Fixed Partition *(5 marks)*
      iii. Dynamic Partition *(5 marks)*
   c) Explain the fundamental differences between internal fragmentation and external fragmentation. *(4 marks)*

3. **a)** Define process scheduling. *(3.5 marks)*
   b) Describe deadlock and starvation with their effects of the system. *(6 marks)*
   c) List and explain the conditions necessary for deadlock. *(8 marks)*

4. **a)** List and explain the strategies for handling deadlock. *(7.5 marks)*

Use the figure below to answer 4b and 4c



If Both P1 and P2 have requested R2,

b) What is the status of the system if the request by P2 is granted before that of P1? *(5 marks)*

c) What is the status of the system if the request by P1 is granted before that of P2? *(5 marks)*

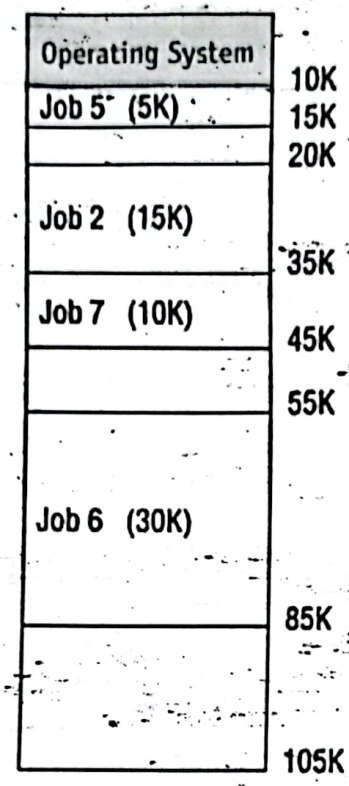
5. **a)** Describe how any two of the following job scheduling algorithms work. *(8 marks)*
   i. First-Come, First-Served
   ii. Shortest-job next
   iii. Round Robin
   iv. Shortest Remaining Time

   b) What is deallocation and explain why it is important in memory management. *(4 marks)*

   c) Differentiate job scheduling with process scheduling *(5.5 marks)*

6. **a)** Differentiate Best-fit vs First-fit allocation *(5.5 marks)*

   Use the figure below to answer 6b and 6c. Explain your answer in each case.



   b) Assume the system uses dynamic partition scheme. What happens to **job 8** that just arrive and needs 30K memory space? *(6 marks)*

   c) Assume the system uses relocatable dynamic partition scheme. What happens to **job 8** that just arrive and needs 30K memory space? *(6 marks)*