



PIONEER INTERNATIONAL UNIVERSITY

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UNIVERSITY EXAMINATIONS

ACADEMIC YEAR: 2020/2021

SEMESTER: MAY-AUG 2021

CODE: BSIT 1030

UNIT: OPERATING SYSTEMS

DATE: AUGUST 2021

TIME: 2 HOURS

INSTRUCTIONS: Answer question one and any other two

SECTION A: Compulsory.

QUESTION ONE(30 marks)

- a) Distinguish between the following pairs of terms **6 Marks**
- (i) Single user and multiuser Operating System
 - (ii) Multitasking and multi-processing operating systems
 - (iii) Time sharing and embedded operating systems
- b) What is the use of Job Queues, Ready Queues & Device Queues? **3 Marks**
- c) In deadlock, processes never finish executing and system resources are tied up, preventing other jobs from ever starting. State and explain the four necessary simultaneous conditions in a system that result to a deadlock situation: **8 Marks**
- d) For each of the following approaches of structuring operating systems, describe any one advantage over the monolithic structure: **3 Marks**
- (i). The layered approach
 - (ii). The micro-kernel approach
- e) Explain the steps you would follow to install a virtual box and install an operating system of choice on the virtual box **10 Marks**

SECTION B: CHOOSE ANY TWO QUESTIONS

QUESTION TWO (20 marks)

- a. With the aid of process transition diagrams discuss the following process states.
- (i). Two state process model **2 Marks**
 - (ii). Three state process model **3 Marks**
 - (iii). five state process model **3 Marks**
- b. Using a diagram explain how medium-term scheduler works **5 Marks**
- c. How do you create a dual-boot system in Microsoft Windows? **3 Marks**
- d. If the operating system is residing in low memory, and the user processes are executing in high memory an operating-system code and data are protected from changes by the user processes. We also need to protect the user processes from one another. Explain how this is done. **4 Marks**

QUESTION THREE (20 marks)

- a. The Process Control Block (PCB) contains many pieces of information associated with a specific process. Explain each of these pieces of information **6 Marks**
- b. Explain three multi-threading models. **6 Marks**
- c. Files are allocated disk spaces by the operating system. There are three main ways to allocate disk spaces to files. Explain **6 Marks**
- d. Explain fragmentation and how it can be resolved. **2 Marks**

QUESTION FOUR (20 marks)

- a. A network operating system (NOS) is an operating system that contains additional features to increase functionality and manageability in a networked environment. State any five network resources that a NOS is designed to provide to clients. **5 Marks**
- b. i) With the aid of a Diagram explain the paging process **3 Marks**
- ii) Software approaches can be implemented for concurrent processes that executes on a single processor or a multiprocessor machine with shared main memory. Explain the Dekkers Algorithm. **4 Marks**

c. With the aid of a diagram, explain swapping.

5 Marks

d. Explain Process Creation and Process Termination operations

3 Marks

