

- I. (a) (i) Outline **four** resources required in a process execution. (4 marks)

- (ii) Differentiate between *interrupt* and *system call* as used in operating systems. (4 marks)

- (b) (i) Explain the term *context switch* as used in operating systems. (2 marks)

- (ii) A lecturer described objectives of process scheduling to an operating systems' class. Explain **two** objectives that he could have mentioned. (4 marks)

- (c) Bruce was required to identify the appropriate memory placement techniques for a proposed operating system. Explain **three** techniques that he could have considered. (6 marks)

2. (a) (i) Outline **two** parts of a directory structure in an operating system. (2 marks)

(ii) Explain each of the following terms as used in operating systems:
 I. . . access right; (2 marks)

II. . . flags. (2 marks)

(b) Figure 1 shows layers in computer memory hierarchy. Use it to answer the question that follows.

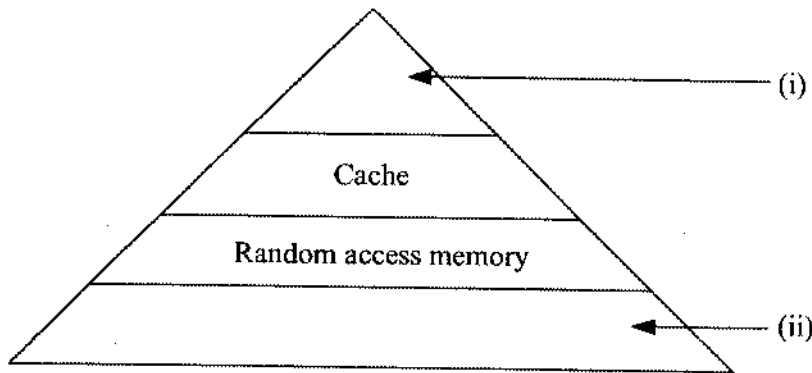


Figure 1
 Describe each of the layers labeled (i) and (ii). (4 marks)

(c) Petro was investigating advantages of memory segmentation in operating systems. Explain **two** advantages that he is likely to have identified. (4 marks)

(d) (i) Outline **two** types of files that could be found in operating systems. (2 marks)

(ii) Brian intends to backup files. Explain **two** backup strategies he could use. (4 marks)

3. (a) Explain each of the following terms as used in operating systems:

(i) bootstrap; (2 marks)

(ii) firmware. (2 marks)

- (b) Figure 2 shows a typical process model used in operating systems. Use it to answer the question that follows.

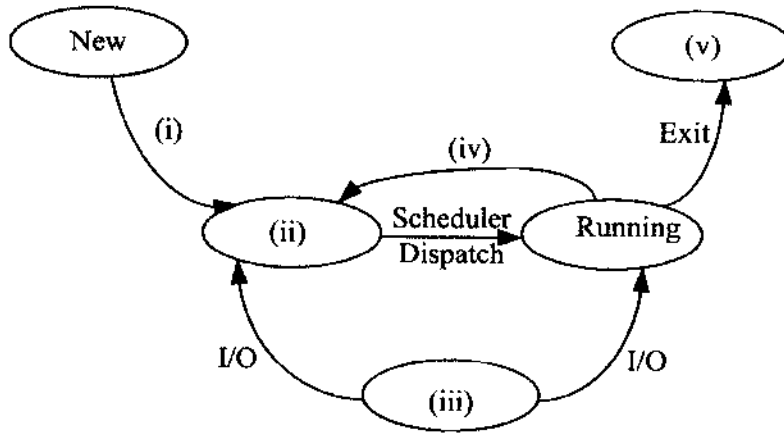


Figure 2

Identify the parts labeled (i),(ii),(iii), (iv) and (v).

(5 marks)

- (c) Dorothy intends to design an operating system that uses swapping in memory management. Explain **two** constraints that are likely to be realized. (4 marks)

- (d) (i) Outline **three** goals of I/O module. (3 marks)

- (ii) A group of module II students were carrying out an assignment on I/O protection strategies in operating systems. Explain **two** strategies that they could identify.

(4 marks)

4. (a) Distinguish between *SCAN* and *C-SCAN* disk scheduling algorithms.

(4 marks)

- (b) Hope intends to develop a file management module for an operating system. Explain **two** file access methods that she should consider.

(4 marks)

- (c) With the aid of a diagram in each case, describe each of the following file system:

- (i) single-level directory;

(2 marks)

- (ii) two-level directory.

(2 marks)

(d) (i) Bev was carrying out a study on benefits of multiprocessor systems. Explain two benefits that she could have established. (4 marks)

(ii) Angie was required to investigate factors that affect performance of a storage disk. Outline four factors that she could have considered. (4 marks)

5. (a) Explain each of the following tables as used in memory management:

(i) hashed; (2 marks)

(ii) clustered page. (2 marks)

(b) Distinguish between *long-term* and *short-term* schedulers as used in process management. (4 marks)

- (c) **Loise** was required to run disk management utilities during computer maintenance. Explain **three** examples of utilities that she could use. (6 marks)

- (d) Figure 3 shows a memory allocation technique. Use it to answer questions that follow.

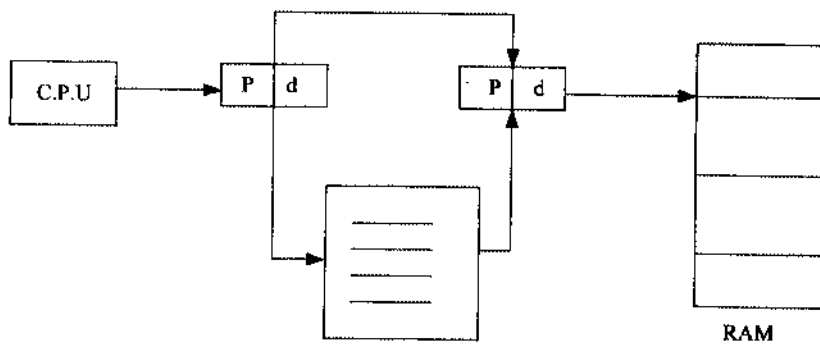


Figure 3

- (i) Explain the memory management techniques depicted in the figure. (2 marks)

- (ii) Explain **two** advantages of the memory management technique identified in (i). (4 marks)

6. (a) Explain each of the following terms as used in disk operations:

(i) seek time;

(2 marks)

(ii) transfer rate;

(2 marks)

(ii) rotational latency.

(2 marks)

(b) Stano listed several examples of I/O buses that could be used in a disk drive. Outline **four** examples that he could have listed.

(4 marks)

(c) File attributes varies from one operating system to another. Outline **five** examples of these attributes.

(5 marks)

(d) With the aid of a diagram, outline a typical process control block (PCB) diagram as used in operating systems. (5 marks)

Lined area for writing the answer to question (d).

7. (a) (i) Define the term *livelock* as used in process management. (2 marks)

Lined area for writing the answer to question 7(a)(i).

(ii) Distinguish between *overlying* and *partitioning* as used memory management. (4 marks)

Lined area for writing the answer to question 7(a)(ii).

(b) Mercy, an intern student was required to discuss examples of file operations during a job interview. Outline **four** examples that she could have mentioned. (4 marks)

Lined area for writing the answer to question 7(b).

- (c) Sayd Company Ltd. intends to replace its single-processor operating system. Outline **four** limitations of the existing operating system that could have influenced the decision. (4 marks)

- (d) Claudius was required to list advantages of dynamic linking in memory management. Explain **three** advantages that he is likely to have listed. (6 marks)

- 8. (a) (i) Define the term *programmable interval timer* as used in operating systems. (2 marks)

- (ii) Outline **four** services that could be provided by I/O subsystem kernel. (4 marks)

- (b) Explain **four** circumstances that would necessitate premature termination of a process execution in an operating system (8 marks)

- (c) With the aid of a diagram, describe the parts of a magnetic disk (6 marks)
