

- c. Describe four strategies to overcome deadlock ones it is Detected. **[8Marks]**

QUESTION THREE [20 MARKS]

- a. Memory management component is one of the operating systems components. Describe four responsibilities of this component **[4 marks]**
- b. State and explain four main types of file organizations implemented in operating systems **[4 marks]**
- c. What is meant by spatial locality of reference? **[2 marks]**
- d. Briefly explain the meaning of the term 'starvation'. **[2 marks]**
- e. Briefly explain the term 'memory hierarchy' as used in operating systems. Use a diagram to illustrate your answer **[4 marks]**
- f. Describe when Hierarchical Memory Organization is Justified **[2 marks]**
- g. distinguish between a page and a frame in the context of memory management **[2 marks]**

QUESTION FOUR [20 MARKS]

- a. With the aid of a diagram, differentiate between segmentation and paging **[4 marks]**
- b. Explain four attributes of a file. **[4 marks]**
- c. Describe direct memory access (DMA) **[4 marks]**
- d. Explain three objectives of I/O device management **[6 marks]**

QUESTION FIVE [20 MARKS]

- a. Interrupt disabling and enabling is a common approach to implementing mutual exclusion, what are its disadvantages? **[2 marks]**
- b. I/O Devices are divided into two categories. State and explain each of these categories. **[2 marks]**
- c. Distinguish between internal fragmentation and external fragmentation **[4 marks]**
- d. State and explain four types of scheduling as used in operating systems **[4 marks]**
- e. Explain the meaning of the following concepts in the context of operating systems.
- i. Distributed operating systems **[2 marks]**
 - ii. Principal of locality **[2 marks]**
- f. When designing memory manager, the designers strive to achieve various goals. Describe each of these goals **[4 marks]**