BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

EDUCATIONAL TECHNOLOGY DEPARTMENT

BACHELOR OF SCIENCE EDUCATION IN COMPUTER SCIENCE

CS111/EDT111 OPERATING SYSTEMS

DURATION 3 HOURS Total marks is 100

Instructions to candidates

AUG 2024

Answer all **questions**

QUESTION 1

a) List any **three** examples of deadlocks that are not related to computer system environment and explain how the deadlock occurs in each case. **[6]**

b) Explain any **three** strategies for dealing with deadlock. **[6]**

c) Give any **four** classes of interrupts and state any **one** source of interrupt for each class mentioned. **[8]**

QUESTION 2

a) Explain any **three** of the main components of a file system. **[6]**

b) Describe **two** differences between a file system and a file system data structure. **[4]**

c) How does the file system determine where to allocate a new file or directory? **[4]**

d) What is the purpose of file system fragmentation and how can it be minimized? **[6]**

QUESTION 3

a) Compare and contrast the First Come First Serve (FCFS) and Round Robin (RR) scheduling algorithms. Discuss the advantages and disadvantages of each. **[10]**

b) Discuss the priority scheduling algorithm. What are the potential issues with this algorithm and how can they be addressed? **[10]**

QUESTION 4

a) Describe the main techniques for external memory management in an operating system? **[12]**

b) Discuss contiguous memory allocation and non-contiguous memory allocation. **[8]**

QUESTION 5

a) Explain the differences between segmentation and paging. **[4]**

b) Give a detailed definition of swapping. **[2]**

c) Determine the sequence of execution of processes for each of the following scheduling algorithms.

i. First Come First Served. **[7]**

ii. Shortest Job First. **[7]**

Process/Arrival Time/Execution time/Burst Time

1	0	14	14
2	2	12	14
3	5	10	15
4	7	4	11
5	19	7	26

*******END OF EXAMINATION******