



**RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES**

**B.Sc. (General) Degree in Information and Communication Technology
First Year - Semester II Examination – September/October 2020**

ICT 1308 – OPERATING SYSTEMS

Time: Three (03) hours

Answer **ALL** the questions.

1.
 - a) State the advantages of multiprogramming. (04 marks)
 - b) Discuss two (02) example situations where the Real time Operating Systems are used. Explain what kinds of functionalities are expected from such a system than an operating system in a normal personal computer. (06 marks)
 - c) Distinguish between a trap and an interrupt. (04 marks)
 - d) What are the functions of utility programs in a computer system? State two (02) such programs. (06 marks)
2.
 - a) Briefly explain the different ways Input Output operations could be started. (05 marks)
 - b) Explain the advantages of Plug and Play system than the normal way of configuring IO devices. (03 marks)
 - c) **“Screen oriented programs support voluntary termination.”** Write down the ways of voluntary termination of processes with examples for each. (06 marks)

- d) "A blocked process can be transferred directly to the running state." Do you agree with this statement? Justify your answer. (06 marks)

3.

- a) What are the thread properties? Explain how such properties are different from process properties. (05 marks)
- b) Briefly explain the advantages and disadvantages of thread yield operation. (04 marks)
- c) What is busy waiting? Why is it not a good way to achieve mutual exclusion? (05 marks)
- d) What are the factors to be considered when selecting a scheduling algorithm? (06 marks)

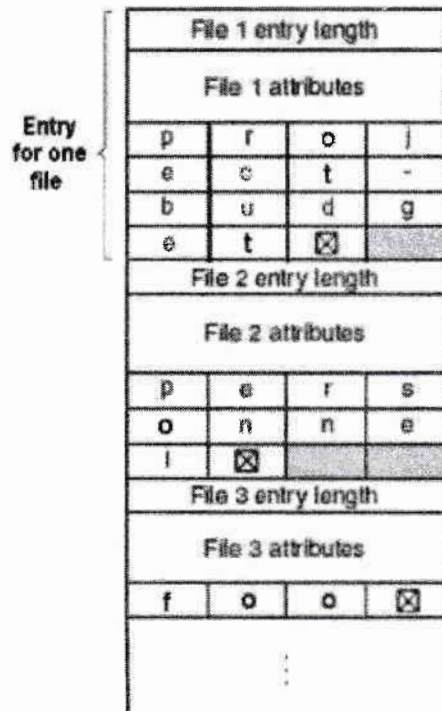
4.

- a) Consider a system having m resources of the same type. These resources are shared by 3 processes, A, B and C which have peak demands of 3, 4 and 6 respectively. For what value of m , will **not** a deadlock occur? Justify your answer.
- i. 7
 - ii. 9
 - iii. 10
 - iv. 13
- (05 marks)
- b) Explain how global numbering of resources can support in deadlock prevention. (05 marks)
- c) Differentiate the terms **word at a time mode** and **burst mode** with respect to Direct Memory Access. Mention the benefits of the **burst mode**. (05 marks)
- d) Explain the different functions handled by each layer of IO Software. (05 marks)

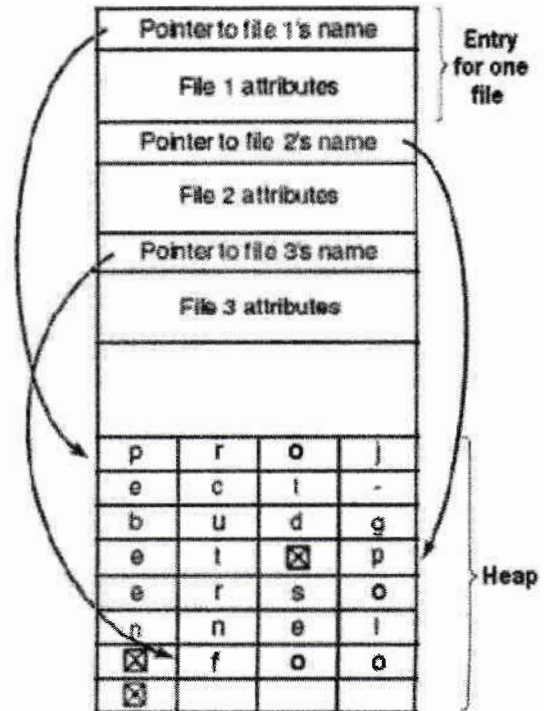
5.

- a) Discuss the advantages of memory management with linked list over the use of bitmaps. (05 marks)
- b) When does a page fault occur? Explain two (02) various page replacement algorithms. (05 marks)

- c) Distinguish between the two (02) types of regular files. (04 marks)
- d) Two figures (a), (b) given below represent two (02) ways of implementing directories. In (a), file name is appended to the end of each entry. In (b), it is separately stored. Elaborate the advantages of (b) over (a).



(a)



(b)

(06 marks)

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