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(20322)

Roll No. .....

B. Sc.(Hons.)(Com. Sc.)-III Sem.

# **NS-3301(CV-III)**

## B. Sc. (Hons.) Examination, Dec. 2021

## **COMPUTER SCIENCE**

**Operating System** 

(BHCS-304)

Time: 1½ Hours]

[Maximum Marks: 75

Note: Attempt questions from all Sections as per instructions.

## Section-A

## (Very Short Answer Type Questions)

Answer any *two* questions out of the following five questions. Each question carries  $7\frac{1}{2}$  marks. Very short answer is required.  $7\frac{1}{2} \times 2 = 15$ 

1. What are the classical problems of synchronization?

- 2. Explain the concept of system, protection and security.
- 3. What are the functions of device management?
- 4. What is preemptive and non-preemptive scheduling?
- 5. What is an operating system? Discuss the various services of the OS.

# Section-B acedca.in (Short Answer Type Questions)

Answer any *one* question out of the following three questions. Each question carries 15 marks. Short answer is required.  $15 \times 1=15$ 

- 6. What is deadlock? Discuss the method for handling deadlocks.
- 7. What is disk scheduling? Describe the various types of disk scheduling.
- 8. What is fragmentation problem? Describe the external and internal fragmentation.

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#### Section-C

## (Detailed Answer Type Questions)

Answer any *two* questions out of the following five questions. Each question carries  $22\frac{1}{2}$  marks. Answer is required in detail.  $22\frac{1}{2} \times 2 = 45$ 

- 9. (a) Explain semaphore.
  - (b) Define resource allocation graph. Give that, there is only one instance of each resource type, describe the resource allocation graph algorithm for deadlock avoidance using a suitable example. acedca.in
- 10. (a) Consider the following page reference string:

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 2, 1, 2, 2, 3, 6.

How many page faults could occur for the following replacement algorithms, assuming four frames?

- (i) LRU replacement
- (ii) FIFO replacement
- (iii) Optimal replacement.

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- (b) Describe the following with suitable example:
  - (i) Directory structure
  - (ii) Free space management.
- 11. (a) Discuss the various scheduling algorithm with example.
  - (b) Explain the difference between thread and process.
- 12. (a) Explain the structure of a disk with the help of example.
  - (b) Explain the concept of swap-space management.
- 13. Write short notes on the following:
  - (a) Multithreading concept
  - (b) Free space management
  - (c) File protection and security.