BCS303 – OPERATING SYSTEM
COMPLETE MODULE WISE QUESTION BANK

Note: Please read the instructions on the last page before starting your preparation.

MODULE – 1 : INTRODUCTION TO OPERATING SYSTEMS

1. Define Operating System. Explain objectives and functions of an OS. **(JAN 2024, JAN 2025, JULY 2025)**
2. Define Operating System. Compare/Explain multiprogramming and time sharing operating systems. **(JAN 2024, SUPPLY-JULY 2024)**
3. Distinguish between the following terms: **(JAN 2025, MQP)**
   a. multiprogramming and multitasking.
   b. multiprocessor system and clustered system.
4. Explain dual mode operation of OS with neat diagram. **(JAN 2025, MAKE-UP JULY 2025, MQP)**
5. Explain services provided by OS for users and it's efficient operation. **(JAN 2024, SUPPLY-JULY 2024, JAN 2025, JULY 2025, MAKE-UP JULY 2025, MQP)**
6. Explain with a neat diagram VM-WARE Architecture. **(JAN 2025)** [OR]
   Explain virtual machines with neat diagram. **(JAN 2024, SUPPLY- JULY 2024, JULY 2025, MQP, JAN 2024)**
7. Explain the different computing equipments. **(JAN 2025)**
8. Define system calls and explain their types with examples. **(JAN 2024,SUPPLY-JULY 2024, JAN 2025, MAKE-UP JULY 2025, MQP)** [OR]
   Explain various system programs and system calls. **(JAN 2024, JAN 2025)**
9. Explain how system calls are used with example. **(JULY 2025)**
10. What is caching? List and explain performance of various storage levels. **(JULY 2025)**
11. What are the different special purpose operating systems? List them and explain each in breif. **(JULY 2025)**
12. Explain layered approach of OS structure. **(MQP)**
13. Describe the structure of operating system and it operations. **(JAN 2024, JULY 2025)**
14. Differentiate Client-Server computing and Peer to Peer computing. **(JAN 2024)**
15. List the responsibilities of OS in process management and memory management. **(SUPPLY-JULY 2024)**
16. Differentiate kernel mode and user mode. **(SUPPLY-JULY 2024)**

MODULE – 2 : PROCESS MANAGEMENT

1. Define process and explain states of a process with diagram. **(JAN 2024, SUPPLY-JULY 2024, JULY 2025, MAKE-UP JULY 2025)** [OR]
   What is process?. Explain process state diagram and process control block with a neat diagram. **(JAN 2025, MQP)**

2. **Describe/Differentiate** shared memory and message passing system of IPC. **(JAN 2024, SUPPLY-JULY 2024)**

3. Explain with example of single threaded and multi threadead process. **(JULY 2025)**

4. Discuss benefits of Thread, single and multithread process. **(JAN 2024)**

5. Define Thread. List and Explain the benefits of multithread programming. **(SUPPLY-JULY 2024)**

6. **List and explain/ Differentiate between** the different types of multithreading models. **(JAN 2025, JULY 2025, MAKE-UP JULY 2025) (SUPPLY-JULY 2024)** [In the MQP they have asked advantages and disadvantages of multithreading model]

7. Analyze Thread Models and Thraed Libraries. **(JAN 2024)** [OR]
   What do you mean by thread libraries? Discuss threading issues. **(MAKE-UP JULY 2025, JAN 2024)**

8. What is inter process communication? Explain direct and indirect communication with respect to message passing system. **(JAN 2025)** [OR]
   Explain two models of inter process communication. **(MAKE-UP JULY 2025, MQP)**

9. Explain five different scheduling criteria used in the computing scheduling mechanism. **(MQP)**

10. With diagram explain SMT architecture. **(MAKE-UP JULY 2025)**

MODULE – 3 : SYNCHRONIZATION AND DEADLOCK

1. What are scheduling criteria, explains CPU-I/O burst cycle. **(JAN 2024)**

2. Discuss with example, the FCFS and RR scheduling alogorithn. **(JAN 2024)**

3. What is critical section? Give the Peterson's solution to processes critical section problem. **(JAN 2024, JAN 2025, MQP, MAKE-UP JULY 2025)**

4. What is critical section problem? Discuss the three requirements that a solution to critical section problem must satisfy. **(SUPPLY-JULY 2024)**

5. What is Semaphopre, explain its usuage and implementation. **(JAN 2024, SUPPLY-JULY 2024, JULY 2025)**

6. What is a semaphore? State a Dining Philosopher problem gives a solution using semaphore. **(JAN 2024, SUPPLY-JULY 2024, JAN 2025, JULY 2025 ,MQP)**

7. What is deadlock and explain necessary conditions for a deadlock to occur. And methods used for handling deadlocks. **(SUPPLY-JULY 2024, JAN 2025, JULY 2025, (MAKE-UP JULY 2025, MQP)**

8. Analyze Deadlock prevention and Deadlock Avoidance.**(JAN 2024)**

9. Explain different methods to recover from deadlocks. **(MQP)**

10. Explain Reader's and Writer's problem in detail . **(JAN 2025)**

11. What is a resource allocation graph? Explain it with neat diagram for deadlock avoidance. **(MAKE-UP JULY 2025, MQP)**

MODULE – 4 : MEMORY MANAGEMENT

1. Describe in detail the paging and its hardware, with a neat diagram of paging model of logical and physical memory and TLB. **(JAN 2024)**

2. With a neat diagram, explain Segmentation and its hardware. **(JAN 2024, JULY 2025, SUPPLY JULY 2024, MQP, MAKE-UP JULY 2025)**

3. Explain Demand Paging with a neat diagram and steps in page fault of virtual memory. **(JAN 2024, JULY 2025, MAKE-UP JULY 2025, MQP)** [OR]
   What is page fault? Describe the steps in handling a page fault with a neat figure. **(JAN 2025, SUPPLY JULY 2024)**

4. Discuss any two page replacement algorithm. **(JAN 2024)**

5. What is thrashing? How can it be controlled? **(SUPPLY JULY 2024, JULY 2025)**

6. What is Fragmentation? List and explain its types. **(JAN 2025, SUPPLY JULY 2024)**

7. Explain the different strategies used to select a free hole from available holes. **(JAN 2025)**

8. Discuss the following: First fit, Best fit and Worst fit. (**JULY 2025, MAKE-UP JULY 2025)**

9. Explain with a neat diagram paging for a 32- bytes memory with 4 - byte pages. **(JULY 2025)**

10. Discuss the structure of the page table with a suitable diagram. **(MQP)**

11. Write a note on copy-on-write technique**. (MAKE-UP JULY 2025)**

12. With the help of a neat diagram, explain the various steps of address binding. **(MQP)**

MODULE – 5 : FILE SYSTEM & DISK

1. What are File operations and File accessing methods? **(JAN 2024)** [OR]
   Discuss different file access methods. **(JULY 2025)** [OR]
   Define File. List and explain different file operations and file attributes. **(JAN 2025, MQP)** [OR]
   Explain in detail about various file operations in a file system. **(MQP)** [OR]

Define the file attributes, List different file operations and explain each in brief. **(JULY 2025)**

2. Describe Tree structured and acyclic - Graph directories. **(JAN 2024, SUPPLY JULY 2024)** [OR]
   Discuss various directory structures with neat diagrams. **(MQP)**

3. Explain the different file allocation methods. **(JAN 2024, JAN 2025, JULY 2025, MAKE-UP JULY 2025, MQP)**

4. With a neat diagram Explain File system mounting? **(JULY 2025)**

5. Explain FCFS, SSTF and SCAN disk scheduling. **(JAN 2024)**

6. Develop a C-program to implement the process systemcalls (Fork( ), exec(), want(), create()). **(JAN 2024)**

7. Develop a C-program to simulate producer consumer problem. **(JAN 2024)**

8. Compare and contrast sequential access and direct access methods for extracting information from files. (**SUPPLY JULY 2024**)

9. Describe the concept of protection domain with an example of a system with three protection domains. (**SUPPLY JULY 2024**)

10. List and explain different goals and protection of an operating system. **(JULY 2025)**

11. Illustrate the concepts of access matrix with suitable examples. (**SUPPLY JULY 2024. MAKE-UP JULY 2025, JAN 2025, MQP)**

12. Explain bit vector and linked free-space list on disc. **(MAKE-UP JULY 2025)**

13. With a neat diagram explain single level and two level directory structure. **(MAKE-UP JULY 2025)**

14. Discuss network attached storage. **(MAKE-UP JULY 2025)**

IMPORTANT INSTRUCTIONS:

1. This question bank is prepared strictly according to the **VTU prescribed syllabus.**

2. Questions are collected and compiled from previous VTU examinations, including: **MQP, January 2024, Supply July 2024, January 2025, July 2025, and Make-Up July 2025 examinations**.

3. The month and year mentioned beside each question indicate the **exam in which the question appeared.**

4. The notation **[OR]** used between questions indicates that the **same concept or topic has been asked in different ways** in various examinations.

5. Students are advised to **understand the concept thoroughly**, as VTU may frame questions in **different formats for the same topic**.

6. Repetition of questions across multiple examinations shows their **importance**, but it does **not guarantee** the same question will appear again.

7. Out of the five modules, **Module 2, Module 3 and Module 4 contain comparatively fewer questions** and can be covered easily, whereas **Module 1 and Module 5 contain a higher number of questions**.

8. Students who feel time-constrained can **first focus on the most frequently repeated questions**. Questions from **July 2024 Supplementary, July Make-Up 2025 and the questions that have appeared only once can be focused on later after completing the remaining important questions.**

9. Proper **diagrams, examples, and clear explanations** should be practiced wherever applicable.

*This Question Bank is prepared by **VTUADDA** team with the objective of helping VTU students prepare smartly, practice effectively, and score confidently in BCS303 examinations.*