

No. 7:

- Define process, I/O-bound process and CPU-bound process.
- List the states of a process. Show their order through diagram.
- Briefly describe the Process Control Block (PCB).
- List scheduling queues along with brief description.
- List schedulers along with brief description.

(4x5=20 Marks)

No. 8:

a) You are Given the Following:-

- A set of Processes  $P = \{P1, P2, P3\}$  ;
- A set of Resources  $R = \{R1, R2, R3, R4\}$

Resource Instances:

- One instance of resource type R1; Two instances of resource type R2;
- One instance of resource type R3; Three instances of resource type R4.

Process States:

- Process P1 is holding an instance of resource type R2 and is waiting for an instance of resource type R1.
  - Process P2 is holding an instance of R1 and an instance of R2 and is waiting for an instance of R3.
  - Process P3 is holding an instance of R3.
- Draw resource-allocation graph by using data as given above.
  - From resource-allocation graph produced in part (a), conclude whether the system is in deadlock state or not? Give reasons for your conclusion.

b) Differentiate between:-

- Logical and physical addresses.
- External fragmentation and internal fragmentation.
- Best-fit and worst-fit memory allocation strategies.
- Segmentation and paging.

(20 Marks)

**NOTE: Attempt Any FIVE Questions in All.**

**Q No. 1:**

- List all phases of a compiler.
- What is a Gateway or Router? Define its function.
- Name the factors that affect the performance of a network.
- Briefly describe any two software process models.

**(6+2+2+10 Marks)**

**Q No. 2:**

- Write an algorithm to implement PUSH operation of a "Stack" data structure.
- Write an algorithm to add an item in "Queue" data structure.

**(10 +10 Marks)**

**Q No. 3:**

You are given two-dimensional arrays A and B of same dimensions i.e., mRows X nCols. Write instructions in C++ or Java computer language to compute their product, and display the resultant array.

**(20 Marks)**

**Q No. 4:**

- What is VPN? Describe it briefly.
- What are different ways of securing a computer network?
- How many layers are there under TCP/IP?
- What is the function of the OSI Session Layer?
- What are MAC addresses?

**(4x5=20 Marks)**

**Q No. 5:**

- What are firewalls?
- Describe star topology.
- What is hybrid network?
- What software problems can lead to network defects?
- What advantages does fibre optics have over other media?

**(4x5=20 Marks)**

**Q No. 6:**

- Define important rules used in Boolean Algebra.
- Write any five Boolean Laws.
- Briefly describe Flip-flop, Register and Shift-Register.
- Define signal and its types.

**(5x4=20 Marks)**