

Seat No. : \_\_\_\_\_

**MD-114**

March-2019

B.C.A., Sem.-III

**CC-204 : Fundamentals of Operating System  
(New Course)**

**Time : 2:30 Hours]**

**[Max. Marks : 70**

1. (A) Answer the following :

- (i) What is Operating system ? Explain the different types of Operating systems. 7
- (ii) Explain fixed partition and dynamic partition memory management schemes. 7

**OR**

- (i) Explain in detail: Deallocation of memory with dynamic partition system.
- (ii) Given the following reference string :

1 2 1 3 1 2 4 2 1 3 4

with memory of 2 page frames, do trace analysis using the following page replacement Policies :

- (1) FIFO  
(2) LRU

Also find the success rates and failure rates with number of page faults.

(B) Answer any **four** :

- (1) The sections of incoming job are called \_\_\_\_\_. 4
- (a) Page Frames (b) Pages  
(c) Sector (d) Block
- (2) \_\_\_\_ is a technique that allows programs to be executed even though they are not Stored entirely in memory.
- (a) Virtual memory (b) Cache memory  
(c) Read only memory (d) All of above

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- (3) \_\_\_\_\_ is contains the page number and its corresponding page frame memory address.
- (a) Job table (b) Page map table  
(c) Memory map table (d) Segmented map table
- (4) \_\_\_\_\_ indicates how far a line is from the beginning of its page..
- (a) Displacement (b) Distance  
(c) Page location (d) None of these
- (5) In \_\_\_\_\_ OS, user can interact via command with operating system.
- (a) Real-time (b) Interactive  
(c) Batch (d) Hybrid
- (6) \_\_\_\_\_ is a variable size section of users job that contains a logical grouping of code.
- (a) Page (b) Buffer  
(c) Segment (d) All of above

2. (A) Answer the following :

- (i) What is a Process ? Explain the different process states and process state transition in detail with diagram. 7
- (ii) Discuss in detail : Process Scheduler. Also differentiate between job scheduler and process scheduler. 7

OR

- (i) Explain in detail : Process Control Block with diagram.
- (ii) Given the following information :

Job Number	Arrival Time	CPU Cycle
A	0	12
B	1	4
C	2	5
D	3	3
E	4	7

Draw a timeline for each of the following scheduling algorithm. Also calculate the average turnaround time and average waiting time.

- (a) FCFS  
(b) SJN  
(c) SRT

(B) Answer any **four** :

- (1) \_\_\_\_\_ is the time required to execute a job and return output to the user.  
(a) Response time (b) Waiting time  
(c) Turnaround time (d) Throughput.
- (2) Job scheduler is also known as \_\_\_\_\_.  
(a) Low level scheduler (b) Middle level scheduler  
(c) Job scheduler (d) High level scheduler
- (3) From the following which is the job status ?  
(a) Hold (b) Running  
(c) Ready (d) All of these
- (4) Shortest Job Next is also known as \_\_\_\_\_.  
(a) Shortest Remaining Time  
(b) Smallest Remaining Time  
(c) Shortest Job First  
(d) Smallest Job First
- (5) \_\_\_\_\_ indicates a period of time assigned to a process for execution.  
(a) Time Quantum (b) Period  
(c) Duration (d) All of these
- (6) \_\_\_\_\_ is an inactive unit, such as file stored on a disk.  
(a) Process (b) Task  
(c) Thread (d) Program

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3. (A) Answer the following :

- (i) What is deadlock ? Explain any five cases of deadlock.  
(ii) What is parallel processing ? Explain the master-slave and symmetric configurations.

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OR

- (i) Discuss deadlock prevention and detection strategies.  
(ii) What is Process Synchronization Software ? Also discuss semaphores.

(B) Answer any **three** :

- (1) Parallel Processing is also known as \_\_\_\_\_.  
(a) Multiprocessing (b) Multitasking  
(c) Multiprogramming (d) None of these
- (2) \_\_\_\_\_ is an indivisible machine instruction, which is executed in a single machine cycle to determine whether the processor is available.  
(a) Test and Set (b) Test and Signal  
(c) Wait and Signal (d) Semaphores

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- (3) \_\_\_\_\_ is a part of a program that must complete execution before other processes can have access to the resources being used.
- (a) Critical Part            (b) Critical Region  
(c) Critical Area            (d) All of these
- (4) From the following which is required condition for a deadlock to occur ?
- (a) Mutual Exclusion    (b) Circular wait  
(c) Resource Holding    (d) All of these
- (5) \_\_\_\_\_ is a synchronization problem between two processes vying for the same resource.
- (a) Soopling                (b) Deadlock  
(c) Race                      (d) Competition

4. (A) Answer the following :

- (i) What are the different types of system devices ? Discuss the role of I/O traffic controller and I/O Scheduler in managing I/O requests. 7
- (ii) How does communication among devices takes place ? 7

**OR**

- (i) Discuss : Access Control Matrix, Access Control Lists and Capability Lists.  
(ii) Explain Contiguous storage and Non-contiguous storage allocation.

(B) Answer any **three** :

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- (1) \_\_\_\_\_ is a dedicated device that has been transformed into shared device through the use of spooling techniques
- (a) Virtual device            (b) Shared device  
(c) Both (a) and (b)        (d) None of above.
- (2) \_\_\_\_\_ is a specialized programmable unit placed between the CPU and the control units.
- (a) I/O control unit        (b) I/O device  
(c) I/O channel            (d) None of these.
- (3) A \_\_\_\_\_ protects a single file.
- (a) Lockwords                (b) Passwords  
(c) Both (a) and (b)        (d) None of these
- (4) A \_\_\_\_\_ is a group of related record.
- (a) File                        (b) Volume  
(c) Program                 (d) Device
- (5) \_\_\_\_\_ is a technique used to save space in files.
- (a) File compression        (b) Data reduction  
(c) File reduction            (d) Data compression