Seat No. : _____

MD-114

March-2019

B.C.A., Sem.-III

CC-204 : Fundamentals of Operating System
(Old 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) Given the following information : **7**

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

OR

(i) What is Parallel Processing ? Explain Master-slave and Loosely Coupled configurations.

(ii) What is deadlock ? Discuss deadlock prevention and avoidance strategies.

(B) Answer any **four** : **4**

(1) From the following which is the job status ?

(a) Hold (b) Running

(c) Ready (d) All of above

(2) Process scheduler is also known as _____.

(a) High level scheduler (b) Middle level scheduler

(c) Job scheduler (d) Low level scheduler

(3) A _____ is a non-negative integer variable that is used as a flag to provide mutual exclusion.

(a) Flag (b) Test

(c) Semaphore (d) Set

(4) _____ is a pre-emptive process scheduling algorithm that allocated the processes to the job closest to completion.

(a) SJN (b) Round Robin

(c) SRT (d) FCFS

(5) What is a livelock ?

(6) Define : aging

2. (A) Answer the following :

(i) What are the different types of system devices ? Discuss components of IO subsystem. **7**

(ii) How does communication among devices takes place ? **7**

OR

(i) Explain the role of I/O traffic controller, I/O scheduler and I/O device handler in managing I/O Requests.

(ii) Disk request for cylinders are in following order :

28,89,132,42,187

The arm is initially at 100. If it takes 1 ms to travel from one track to the next adjacent one. Find out the total number of cylinders travelled and seek time using following seek strategies.

(i) FCFS

(ii) SSTF

(iii) LOOK(Elevator).

(B) Answer any **four** : **4**

(1) RAID stands for _____

(a) Reducing array of independant disk

(b) Redundant array of independent disk

(c) Redundant array of inexpensive disk

(d) None of above

(2) Which of the following can be considered as virtual device ?

(a) Plotter (b) Printer

(c) Disk pack (d) None of above

(3) DMA stands for _____

(a) Direct Memory Address

(b) Direct Memory Access

(c) Disk Memory Address

(d) Disk Memory Access

(4) _____ are the temporary storage areas residing in main memory, channel and control units.

(a) Flash memory (b) Cylinders

(c) Cache memory (d) Buffers

(5) Define : channel status word.

(6) What is meant by seek strategy ?

3. (A) Answer the following :

(i) Explain fixed partition and dynamic partition memory management schemes. **7**

(ii) Explain in detail : Paged memory allocation. **7**

OR

(i) Write a detailed note on : Relocatable Dynamic Partition.

(ii) Explain in detail : Segmented Memory Allocation.

(B) Answer any **three** : **3**

(1) The sections of main memory are called _____.

(a) Page Frames (b) Page

(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

(3) _____ is a memory allocation scheme that loads a programs page into memory at the time it is needed for processing.

(a) Paged memory allocation

(b) Segmented/demand paged memory allocation

(c) Segmented memory allocation

(d) Demand Paging

(4) What is external fragmentation ?

(5) What is first-fit memory allocation ?

4. (A) Answer the following :

(i) Discuss : Direct Record Organization and Indexed Sequential Record Organization. **7**

(ii) Explain Contiguous Storage and Non-contiguous storage allocation. **7**

OR

(i) State and explain different methods of access control verification.

(ii) What is the role of operating system in security ? Discuss antivirus software and firewalls.

(B) Answer any **three** : **3**

(1) A virus must be

(a) Self-executing (b) Self-replication

(c) Both (a) and (b) (d) None of above.

(2) _____ is a computer program that replicates itself and is seif-propagating in main Memory.

(a) Virus (b) Trojan Horse

(c) Worm (d) Logic Bomb

(3) _____ file contains instructions.

(a) Program (b) Directory

(c) Data (d) Sub-directory

(4) What is meant by Denial of Service Attack ?

(5) What is meant by multifile volume ?

_____

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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** : **4**

(1) The sections of incoming job are called _____ .

(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

(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** : **4**

(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

3. (A) Answer the following :

(i) What is deadlock ? Explain any five cases of deadlock. **7**

(ii) What is parallel processing ? Explain the master-slave and symmetric configurations. **7**

OR

(i) Discuss deadlock prevention and detection strategies.

(ii) What is Process Syncronization Software ? Also discuss semaphores.

(B) Answer any **three** : **3**

(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

(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** : **3**

(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