Diploma in Software Engineering (DSE21.2F) (NIBM-SOC-COM-211-1-2-4-11)
OPERATING SYSTEMS
26th August, 2022, 09:00 am - 12:00 pm

Time allowed: Three hours

Question 01 (20 Marks)

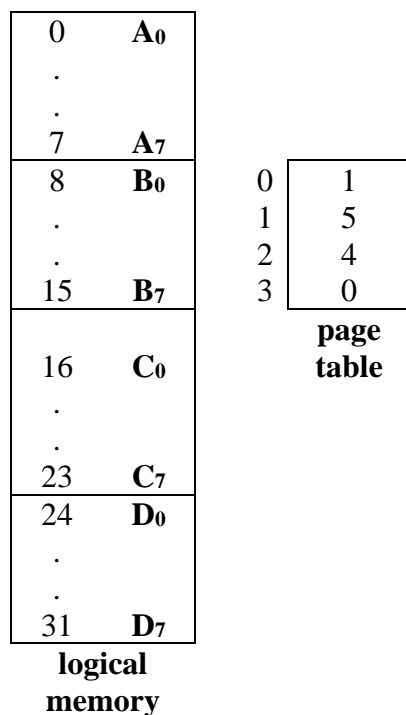a) Consider the following set of process with burst time given below;

Process	Burst Time(ms)	Arrival Time	Priority
A	8	0	3
B	2	1	1
C	1	2	2
D	4	3	4
E	2	4	0
F	5	5	2

Draw Gantt charts and calculate the average waiting time and turnaround time for the above processes using;

    i.   FCFS scheduling (02 Marks)

    ii.   SRTF scheduling (04 Marks)

    iii.   Priority with non-preemptive scheduling (03 Marks)

    iv.   Round Robin with time quantum 4ms. (03 Marks)

b) Draw a Resource allocation graph for the following processes and check for a possibility of a deadlock where all resource types have only one instance. (05 Marks)

- Process A holds R1 and waits for R0
- Process B holds R0 and waits for R2
- Process C holds nothing but waits for R3
- Process D holds R3 and waits for R1 and R2
- Process E holds R2 and waits for R1 and R0

c) Draw the Process State Diagram (03 Marks)

Question 02 (20 Marks)

a) What is segmentation? Explain with example (04 Marks)

b) Given memory partitions of 100K, 500K, 150K, 300K, 250K and 600K (in Order) needs to map 95K, 520K, 225K, 30K, 426K and 125K (in Order). Draw the memory allocation diagrams using First Fit and Best Fit algorithms. (06 Marks)

c) What is internal fragmentation? Explain with an example. (04 Marks)

d) Describe the paging algorithm and transform the values from logical memory to the physical memory. Page size = 4 Bytes, Physical memory =48 Bytes (06 Marks)

0	A_0
.	
.	
7	A_7
8	B_0
.	
.	
15	B_7
16	C_0
.	
.	
23	C_7
24	D_0
.	
.	
31	D_7

logical memory

0	1
1	5
2	4
3	0

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Question 03 (20 Marks)

a) Explain the Magnetic Hard Disk structure and Data Storage. (04 Marks)

b) Consider the following file directories to be allocated on a Hard Disk with 32 Blocks (0-31, 4 sectors and 8 tracks) and map using following methods; (06 Marks)

1) Contiguous allocation

File Name	Start Block	Length
A	2	3
B	10	2

2) Link List

File Name	Start Block	End Block	Link List
P	0	1	7, 13,9

3) Indexed allocation

File Name	Index Block	Link List
X	15	8, 12, 6

b) The head of a moving hard disk with 300 tracks (0-299) is currently positioned over track 75 and moving towards the track 76. The requested tracks in the order received are 85, 105, 12, 288, 32, 55, 158, 210, 64 and 176. Calculate the average seek length for following disk scheduling algorithms. (10 Marks)

    1) First In First Out (FIFO)

    2) Shortest Seek Time First (SSTF)

    3) Scan

    4) Look

PART B – 30% out of 100 Marks

1) Explain the purpose of following commands with examples. (06 Marks)
   A. who
   B. diff
   C. man
2) Explain following commands output (08 Marks)
   A. grep -c "student" school.txt
   B. tail -n5 /etc/passwd
   C. cat linux.txt | grep "^linux"
   D. chmod u+x,g-x myfile.txt

3) What is the different between "**rmdir**" and "**rm**" command? (03 Marks)
4) Explain the steps use to create a file using cat command?(03 Marks)

5) Match the items below to their counterparts in table (10 Marks)

ls –aR	yy	rmdir	pwd	cd /
whoami	head	Sgid	rm	Shell script
ls -ltr	cd ~	uname	dd	top

#	Description	Keyword
01	Which command is used to display present working directory	
02	Which command is used to copy a line in vi editor	
03	Which command shows the current working user	
04	Order Files Based on Last Modified Time (In Reverse Order)	
05	This command use to change existing users info	
06	Which command is used to display all the files including hidden files in your current and its subdirectories?	
07	Which among the following is used to write small programs to control Unix functionalities?	
08	This command used to change directory to root	
09	Return the specified number of lines from the top of a file	
10	This command used to delete a directory	

PART C– 10 % out of 100 Marks. (10 MCQ questions)

1. Android operating system had been built by_____
   a) Microsoft
   b) Apple
   c) Google
   d) Amazon

2. Which of the following is a layer not in Android Architecture?
   a) Native Libraries
   b) Cocoa Touch
   c) Linux Kernel
   d) Application Framework

3. Which of the following is a Layer not in iOS Architecture?
   a) Core OS
   b) Media Layer
   c) Application
   d) Core Service

4. Which of the following is not a Step in Android Booting process?
   a) Bootloader
   b) Kernel
   c) System Service
   d) BootROM

5. Usage of the Surface manager in Android OS?
   a) Bootloader
   b) Kernel
   c) For graphics
   d) BootROM

6. Which of the following Statement is not true about Dalvik Virtual Machine?
   a) Optimized for low memory requirements
   b) Stack-based Byte Code is used
   c) It is a license free VM
   d) Android app is run on top of Dalvik Virtual machine

7. Which one is not the core component of the Core Service layer of the iOS ?
   a) Address Book framework
   b) Cloud Kit framework
   c) Core Data framework
   d) Linux Kernel

8. Purpose of Dex Compiler is
   a) Convert Register-based byte-code to Binary Code
   b) Convert Register-based byte-code to Stack Based Byte Code
   c) Convert Register-based byte-code to Dalvik Byte Code
   d) Convert Java Byte Code to Dalvik Byte Code

9. Which of the following is not the boot sequence of iOS?
   a) BootROM
   b) LLB
   c) iBoot
   d) ROM

10. Which of the following Framework is not in the Core Services Layer?
    a) Cloud Kit framework
    b) Foundation Framework
    c) Social framework
    d) iAd Framework