SH-III/BCA-301/19

BCA 3rd Semester (Honours) Examination, 2019-20

BACHELOR OF COMPUTER APPLICATION

Course ID : **Course Code : BCA-301**

Course Title : Operating System

Time: 4 Hours **Full Marks : 80**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group-A

1. Answer *all* the questions: 10×1=10

(i) Which one is the reasons behind the increase of throughput?
- (a) Multiprogramming
- (b) Multitasking
- (c) Time Sharing Job
- (d) All of the above
- (e) None of the above

(ii) In the memory hierarchy of operating system, _____ is the fastest accessible memory.
- (a) CPU Register
- (d) Disk
- (c) Main Memory
- (d) Cache Memory
- (e) None of the above

(iii) The surface of floppy disk is made of concentric circles are called
- (a) Sector
- (d) Records
- (c) Blocks
- (d) Tracks
- (e) None of the above

(iv) A Thread is a
- (a) Task
- (d) Process
- (c) Programme
- (d) Lightweight Process
- (e) None of the above

(v) Which scheduling algorithm is inherently pre-emptive?

(a) FCFS

(d) SJF

(c) RR

(d) Priority Scheduling

(e) None of the above

(vi) The optimal scheduling algorithm is

(a) FCFS

(d) SJF

(c) RR

(d) Priority Scheduling

(e) None of the above

(vii) Thrashing is

(a) reduce page I/O.

(d) decrease the degree of multiprogramming.

(c) implies excessive page I/O.

(d) improves the system performance.

(e) None of the above

(viii) Fork is

(a) the creation of a new job.

(d) the dispatching of a task.

(c) increasing the priority of a task.

(d) the creation of new task.

(e) None of the above

(ix) The mechanism that bring a page into memory only when it is needed, is called

(a) Segmentation

(d) Fragmentation

(c) Demand Paging

(d) Page Replacement

(e) None of the above

(x) PCB stands for

(a) Program Control Block

(d) Process Control Block

(c) Process Communication Block

(d) Program Counter Block

(e) None of the above

Group-B

2. Answer *any ten* questions: 2×10=20

(i) What is a process?

(ii) What is Starvation? Explain your answer.

(iii) What do you mean by Turn Around Time?

(iv) What are the basic operation of binary semaphore?

(v) What do you mean by distributed OS?

(vi) What is the latency time in the context of disk scheduling?

(vii) Define Page fault?

(viii) What is Premptive resource?

(ix) Define spooling?

(x) Define Page frame.

(xi) What is I/O bound process?

(xii) Write the difference between program and process.

(xiii) Write the difference between user level thread and karnel level thread.

(xiv) What is a file?

(xv) What is the objective of disk scheduling?

Group-C

3. Answer *any four* questions: 5×4=20

(i) Discuss different state of process using a block diagram.

(ii) Discuss the role of OS as a resource manager.

(iii) Discuss the first fit, best fit and wrost fit technique in the context of memory allocation.

(iv) Discuss the producer-consumer problem.

(v) Distinguish between 'Starvation' and 'Deadlock'.

(vi) Describe Inverted page table techniques briefly.

Group-D

4. Answer *any three* questions: 10×3=30

(i) (a) Explain the PCB.

(b) Suppose that the following process arrive for execute at the time indicated:

Process	Arrival time	Brust time
P_0	0	5
P_1	2	7
P_2	3	9
P_3	3	4
P_4	4	3

Draw the Gnatt chart and calculate:—

(I) Average waiting time in SJF Scheduling.

(II) Calculate the response time for process P_3 in FCFS Scheduling.

(III) Average Turn around time in RR Scheduling if time slice is 3ns. 4+6=10

(ii) (a) Define Deadlock.

(b) Consider the following table:

Process	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	1 0 0 2	2 3 5 3	1 2 3 3
P_1	0 0 2 0	2 1 3 5	
P_2	1 0 3 0	1 2 3 2	
P_3	1 2 3 4	2 3 3 6	
P_4	1 0 0 3	2 4 5 6	

(I) Check the system is in Safe State or not.

(II) If process P_1 request $(0, 4, 2, 0)$, can the request be granted immediately? What is the safe sequence if it can be granted. 2+4+4=10

(iii) (a) What is sector and track?

(b) Discuss SCAN Scheduling and SSTF Scheduling in brief. 2+4+4=10

(iv) (a) How does spooling improve efficiency of any OS?

(b) Consider the following page references:

$3, 2, 1, 2, 6, 1, 2, 1, 3, 6, 7, 1, 2, 7, 3$

How many page fault would occur for the following page replacement algorithms, assuming frame size – 4

(I) LRU page replacement

(II) FIFO page replacement

(III) Optimal page replacement 1+9=10

(v) (a) Differentiate between process switching and context switching.

(b) Explain with example how critical section problem arise when two or more process try to access a shared variable concurrently. 3+7=10

(vi) (a) What is FAT? Explain.

(b) Discuss different attributes of a file?

(c) What is virtual memory? 2+6+2=10

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