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TCS-503/TIT-503

B. Tech. (CS/IT) (Fifth Semester) Mid Semester EXAMINATION, 2017 OPERATING SYSTEM

Time : 1:30 Hours]

[Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

i. Write True/False : (1×5=5 Marks)

- (a) Connection failure in the network error is handled by the O. S.
- (b) Kernel is made of various modules which cannot be loaded in running operating system.
- (c) The state of process is defined by the final activity of the process.
- (d) The process control block is a data structure.
- (e) User level threads are scheduled by the kernel.

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2. Attempt any five parts : (3×5=15 Marks)

(a) Define the following :

- (i) Degree of multi-programming
- (ii) Context switching
- (iii) Preemptive and Non-preemptive scheduling

(b) Differentiate between multi-programming, multi-processing and multitasking.

(c) What do you understand by Process Control Block (PCB) ? Explain with the help of a neat diagram.

(d)

Process I. D.	Arrival Time	Burst Time
P1	0	8
P2	0	10
P3	0	2
P4	5	4
P5	6	7

- (i) Draw the Gantt chart of the above question.
- (ii) Calculate average waiting time.
- (iii) Calculate average turn around time.
- (e) Define long-term scheduler, middle term scheduler and short-term scheduler. What is the role of dispatcher ?

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(f) For(i=0; i<n ; i++)

Fork();

Find the total number of process and child process for the above question.

Section—B

3. Attempt any two parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a) With the help of neat and labelled figure explain the functioning of process state diagram.

(b)

P.id	Arrival Time	Burst Time	AWT	ART	TAT
P1	0	6	?	?	?
P2	0	8	?	?	?
P3	3	6	?	?	?
P4	5	4	?	?	?
P5	7	4	?	?	?

For the above questions by assuming time quanta = 2, draw the Gantt chart for it using Round Robin Technique.

(c) Differentiate between the user level thread by giving the suitable example. Also support your answer by giving any ten other differences.

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4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a) `#include <stdio.h>`
`#include <unistd.h>`
`int main ()`
`{ fork ();`
`fork () && fork () || fork ();`
`fork ();`
`printf("forked\n");`
`return 0;`
`}`

How many processes will be generated after the execution of above program ?

(b)

P.no	Arrival Time	Burst Time	WT	RT	TAT
P1	0	5	?	?	?
P2	1	3	?	?	?
P3	2	2	?	?	?
P4	2	8	?	?	?
P5	3	9	?	?	?

By using the Shortest Job First (SJF) scheduling with preemption technique also find the average waiting, average response, average turn around time, throughput and CPU utilization.

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- (c) Discuss how the following pairs of scheduling criteria conflict in certain settings :

- (i) CPU utilization and resource time
- (ii) Average turn around and maximum waiting time
- (iii) I/O device utilization and CPU utilization

5. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a)

P. No.	Arrival Time	Burst Time	Type	Scheduling
P1	0	2	System	Round Robin (TQ=1ms)
P2	1	1	System	Round Robin
P3	1	3	Staff	FCFS
P4	1	4	Staff	FCFS
P5	2	5	User	Round Robin (TQ=4 ms)

By using the multi-level queue scheduling calculate the average waiting time, average turn around time.

(b)

P.No.	AT	BT	Priority	AWT	ART	ATT
P1	0	5	3	?	?	?
P2	1	7	2	?	?	?
P3	2	3	4	?	?	?
P4	3	10	1	?	?	?

By using priority scheduling calculate the CPU utilization and throughput of system.

- (c) With the help of neat labeled diagram explain the picture of a process in the memory. Support your answer with explanation where required.