Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

Mid Semester Examination - Synoptic

March 2018

Max. Marks: 20	Duration: 60 Min
Class: S.E.	Semester: IV
Course Code: CE43/IT44	Branch: Computers/IT
Name of the Course: Operating Systems	

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

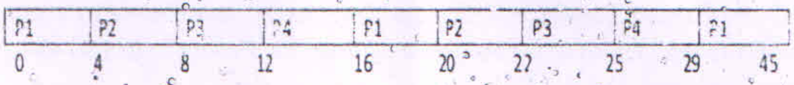
(3) Assume suitable data if necessary

Q No.	Question	Max. Mark	CO
Q.1	Use Round Robin Scheduling for the process mentioned below where time quantum, Q=4	06	CO2
	1. Draw Gnatt chart of the schedule.	[2M]	
	2. Calculate the Completion Time of all the processes.	[1M]	
	3. Calculate Turn Around Time of all the processes.	[1M]	
	4. Calculate Waiting Time of all the processes.	[1M]	
	5. Calculate Average Waiting Time	[1M]	

Answer:

Process	Arrival Time	Burst Time	CT	TAT	WT
P1	0	24	45	45	21
P2	1	6	22	21	15
P3	2	7	25	23	16
P4	3	8	29	26	18

Gnatt Chart



P1	P2	P3	P4	P1	P2	P3	P4	P1

0 4 8 12 16 20 22 25 29 45

Average Waiting Time= 17.5

Q No.	Question	Max. Mark	CO
Q.2(a)	Differentiate between Simple Batch System and Serial Processing System.(Any 5 points) **Answer:** (1 mark for each correct difference) * 5 - 5 marks	05	CO1
	OR		
	What are the various Process States? (Draw suitable diagram.) **Answer:** (1 mark for each state)*5 - 5 Marks (If Process State diagram is not drawn 0.5 marks will be deducted)	05	CO1

Q.2(b) Consider the code given below and answer the questions. 03

```
#include<stdio.h>
void main()
{
int p1,p2;
p1 = fork();
wait();
if (p1 == 0) {
p2=fork();
if(p2==0)
printf("Child1\n");
else
printf("Child2\n");
}
printf("Main\n");
}
```

(i) What is the Output of the code given? [1M]

(ii) Justify your answer. [2M]

Answer:

Correct for Output - 1 marks

Justification - 2 marks

Output:

```
Child2
Main
Child1
Main
Main
```

OR

Output:-	Justificatn Sequence
Child2	① First Fork ....
Main	② First if ....
Main	④ Parent1 resume...
Child1	③ Child12 executes...
Main	

Justification:

1. First fork creates Parent1 and Child1 as wait is executed Parent1 waits for Child1 to complete the execution.

2. First if condition is true for Child1 it enters if statement code block and executes fork, Parent12 and Child12 are created. As wait is not executed within if, Parent12 will continue executing without waiting for Child12. As Parent12 is already in main memory and Child12 PCB block needs to be created after fork. The Parent12 will execute first. Second if condition is false for Parent12 and it will go to else and Print "Child2" and after that it prints "Main".

3. Once PCB is created for Child12 it will execute and enter into second if block as condition ids true for Child12. And it Prints "Child1" and then it prints "Main".

4. Once Parent12 and Child12 completes execution Parent1 can resumes its execution. As first if condition is false for Parent1, it will skip the if code block and Print "Main".

Q.3

Consider the following snapshot of a system at time T0.Total instances of resource are <A,B,C,D> = <12,12,8,10>. Deduce whether the system is in Safe State for given snapshot? (If yes give the safe sequence)

06

CO3

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	2 0 0 1	4 2 1 2	3 3 2 1
P1	3 1 2 1	5 2 5 2	
P2	2 1 0 3	2 3 1 6	
P3	1 3 1 2	1 4 2 4	
P4	1 4 3 2	3 6 6 5	

Answer:

(0.5 for each entry in need matrix)*5 - 2.5 marks
(0.5 marks for each successful step in safety algorithm)*5 - 2.5 Marks
Safe State - 0.5 Marks
Safe Sequence - 0.5 Marks

	Need	First Iteration		Second Iteration	
	A B C D	Available	Status	Available	Status
P0	2 2 1 1	3 3 2 1	Success		
P1	2 1 3 1	5 3 2 2	Fail	7 10 6 6	Success
P2	0 2 1 3	5 3 2 2	Fail	10 11 8 7	Success
P3	0 1 1 2	5 3 2 2	Success		
P4	2 2 3 3	6 6 3 4	Success		
		7 10 6 6			

Safe State exists.

Safe Sequence is P0, P3, P4, P1, P2