Mid Semester Examination

School of Computer Engineering

KIIT UNIVERSITY, BHUBANESWAR

Time: 2hrs   Full Mark: 25

[ANSWER FIVE QUESTIONS INCLUDING QUESTION NUMBER 1]

1. Answer all the questions   [**1 X 5**]
   a) The maximum number of processes that can be in Ready state for a computer system with n CPUs is

   (A) n   (B) n^2 (C) 2^n (D) Independent of n

   b) The following two functions P1 and P2 that share a variable B with an initial value of 2 execute concurrently. What would be the possible value(s) of B after completion of P1 and P2?

P1 ( ) {	P2 ( ) {
B = 1;	B = 3 + B;
B = 3 * B;	}
}	

   c) What is a system call? What is it's use?
   d) There are 6 processes in the ready queue. What is the maximum response time of a process if round robin scheduling policy is used with time quantum of 5units?
   e) Define Batch operating system.

2. Write short notes   [**2 X 2.5**]
   a) Process Control Block
   b) User level thread vs kernel level thread

3.   [**2.5 + 2.5**]
   a) Discuss each of the possible state transition takes place in process state transition diagram during the life time of a process. Write down the functionality of different scheduler involved in each state transition.
   b) Discuss the producer consumer problem. Write a producer consumer solution using semaphore that satisfies the following requirements.
      I.   There is a 50 element buffer.
      II. A consumer will consume the item which is produced very recently.

4. [2.5 + **2.5**]
   a) Write down all the requirements of the critical section problem. Discuss the two process solution for critical section problem which satisfies all requirements.
   b) The following program consists of 2 concurrent processes. The semaphores are initialized as S0=1, S1=2.

P1	P2

while (true) {
　　　wait (S0);
　　　wait (S0);
　　　print (0);
　　　signal (S1);
}
	while (true) {
	　　　wait (S1);
	　　　print (1);
	　　　signal (S0);
	　　　signal (S0);
	}

Is there any possibility of two consecutive '1' get printed?
Is there any possibility of two consecutive '0' get printed?
Justify your answer.

5. [2.5 + **2.5**]
   a) Define the role of an operating system in a computer. Discuss different types of operating system suitable in different scenario.

   b) Describe the multilevel feedback queue algorithm. How does MFQA satisfies the functionalities of SJF, priority scheduling and round robin scheduling?

6. For the below given data find out wait time of each process and sequence of completion of the processes using Round Robin(time slice=2) and SRTF (SJF with preemption) algorithm.   [5]

Process	CPU Burst Time	Arrival Time
P1	09	00
P2	04	02
P3	08	08
P4	05	09
P5	07	10

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