Question Paper



SCHOOL OF INFORMATION SCIENCES (SOIS) FIRST SEMESTER MASTER OF ENGINEERING - ME (Embedded Systems) DEGREE EXAMINATION - APRIL 2017 Monday, 24,2017 Time :10:00AM- 1:00PM

Real Time Operating Systems [ESD 603]

Marks: 100

Duration: 180 mins.

Answer all the questions.

1)	What is the THREE main purposes of a system? With help of diagram explain	n operating briefly.	(10)
2)	 a. What is meant by Belady's anan b. What is meant by preemption? Wha (5+5) 	noly? t is its use?	(10)
3)	With neat diagrams explain the schedu (2x5 marks)	uling algorithms	(10)
	(i) Round Robin Scheduling(i) Multilevel Feedback Queue Schedul	ing.	
4)	What is meant by a race condition? Ex help of an example. Also list and expla which should be satisfied by any soluti section problem. $(2+3+5)$	plain with the in the conditions on to a critical	(10)
5)	State the classical "Sleepy Barbers provide a solution for the same using s giving adequate comments or explana indicate the number of semaphores us values and the purpose of using them.	problem†and semaphores, tion. Clearly ed, their initial	(10)
6)	Describe paging as a memory manage Draw a diagram which indicates how lo converted to a physical address in this mention the benefits and drawbacks o (3 + 5 + 2 marks)	ment approach. ogical address is scheme. Also f this approach.	(10)
7)	Explain the concept of virtual memory paging.	and demand	(10)
8)	Consider the following snapshot of a system marks)	(1+1+8	(10)
	, Allocation	MAX	
	Available		

		ABC	ABC	А
B C 5 2	P0	0 1 0	0 1 1	1
_	P1 P2 P3 P4	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	

A, B and C are the resource types. P0, P1, P2, P3 and P4 are the 5 processes.

The current allocation, the maximum resources required by each process and the available resources have been given. Answer the following questions using Bankers algorithm.

(i) Determine the maximum number of resources of each type in the system.

(ii) Determine the Need matrix.

(iii) List the steps in determining whether the system is safe or not. Give the safe

sequence if present.

⁹⁾ What is Real Time Operating Systems? What are all ⁽¹⁰⁾ types of RTOS, explain with examples? Define briefly characteristics of Real Time systems. (2+4+4marks)

¹⁰⁾ Consider three processes P1, P2 and P3. The periods for P1, P2 (10) and P3 are 50, 30 and 75 respectively. And their processing times are 10,10 and 25 respectively.

(i) Is it possible to schedule these tasks based on CPU utilization test?

(ii) Draw the Gantt chart which depicts the Rate Monotonic scheduling for the above processes. Do the processes meet their deadlines in this case?

(4+ 6 marks)