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Code No. : 18422

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.C.E.) VIII-Semester Main & Backlog Examinations, June-2022

Real Time Systems (PE-VI)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define task? Draw a state transition diagram representing task states?	2	1	1	1
2.	Write the different phases of the periodic task?	2	1	1	1
3.	List any two advantages with clock driven scheduling?	2	1	2	1
4.	Define deadline? Differentiate between Preemptive and Non-preemptive Scheduling?	2	2	2	2
5.	List the main disadvantages of the priority inheritance protocol?	2	1	3	1
6.	Write the applications of semaphores.	2	2	3	2
7.	List any four functions of POSIX RTOS?	2	1	4	1
8.	List the real-time operating systems that are commercially available for hard real-time applications?	2	1	4	1
9.	Define the terms a) fault tolerance b) fault coverage	2	1	5	1
10.	List the various Faults that can arise in an RTOS-based system?	2	1	5	1
Part-B (5×8 = 40 Marks)					
11. a)	Explain the difference between Periodic, aperiodic and sporadic tasks with an example.	4	2	1	1
b)	What is meant by Data dependency? With suitable example explain the effect of data dependency on total system performance in a real time system?	4	3	1	2
12. a)	With a suitable example describe the cyclic EDF algorithm?	4	2	2	1
b)	Demonstrate the scheduling of tasks on a multiprocessor systems with a suitable example?	4	3	2	2
13. a)	Write the Differences between the Priority-Inheritance and Priority-Ceiling Protocols?	3	2	3	1
b)	Consider a fixed-priority system in which there are five tasks T_i , for $i = 1, 2, 3, 4$, and 5, with decreasing priorities. There are two resources X and Y. The critical sections of T_1, T_2, T_4 , and T_5 are $[Y; 3], [X; 4], [Y; 5 [X; 2]]$, and $[X; 10]$, respectively. (Note that T_3 does not require any resource.) Find the blocking times b_i (rc) of the tasks.	5	4	3	2

Contd... 2

14. a)	Explain the process of interrupt handling procedure in RT Linux?	4	2	4	1
b)	Describe the features of VxWorks RTOS that makes it suitable for hard real-time applications?	4	3	4	1
15. a)	Demonstrate how RTOS may be used to create a face detection system?	5	2	5	1
b)	Distinguish between the various faults tolerances approaches used in real-time systems?	3	3	5	2
16. a)	Define the following characteristics of Real time systems a) Optimality b) Predictability c) Periodicity d) Scalability	4	2	1	1
b)	Explain how scheduling in RM Algorithm is done with precedence constraints with a suitable example?	4	4	2	2
17.	Answer any two of the following:				
a)	Describe the Rules of the Basic Priority-Inheritance Protocol?	4	2	3	1
b)	Compare the features of Vxworks and μ COS?	4	3	4	2
c)	Describe hardware and software redundancies in real-time system design?	4	3	5	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

ECC ✓
6