UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020

Programme Name: B.Tech/ Electronics+IoT   Semester   : VIII
Course Name   : Computer Control   Time   : 03 hrs.
Course Code   : ICEG411   Max. Marks : 100
Nos. of page(s)   : 3
Instructions: Attempt all the questions. Assume the necessary data.

S. No.		Marks
Q.1	**A. Control in design of an information system is used to:** a) inspect the system and check that it is built as per specifications b) protect data from accidental or intentional loss c) ensure that the system processes data as it was designed to and that the results are reliable d) ensure privacy of data processed by it **B. In an Adaptive control method, we control the system parameters with respect to which of the following.** a) Non-linearity b) Input parameters c) Reference Model's parameters d) None of the above	**(2*2.5=5)**
Q 2	**A. Which of the following is not a layer of the ISO seven layer reference model?** a) Data Link Layer b) Circuit Layer c) Session Layer d) Network Layer **B. In Ward and Mellor method which of the following model represents the requirement in terms of the abstract entities?** a) Environmental Model b) Essential Model c) Behavioral Model d) None of the above	**(2*2.5=5)**
	Fill in the blanks in the following questions:	**(5*1=5)**

Q 3	1. In the task state, the task that has control of the CPU at a time is known as ……………………. 2. In the task state, if the attributes of task and the resources required to run the task is available to CPU is known as ……………………. 3. In the task state, if the operating system is aware of existence of the task, but the task has not allotted a priority, is known as ……………………. 4. In the task state, If the CPU is not aware about the existence of the task, it is known as ……………………. 5. The basic function of the task management module is to keep ……………… of the state of each task.	
Q 4	**State true or false for the followings:** 1. The status of various tasks may be changed by actions within the operating systems. **T/F** 2. Real-time systems have to carry out both periodic and aperiodic activities. **T/F** 3. In distributed control, may computers perform essentially similar tasks in parallel? **T/F** 4. In hierarchical control systems, tasks are not divided according to the functions. **T/F** 5. An important aspect of computer interfacing is the timing of the transfer of data and synchronization of transfers. **T/F**	**(5*1=5)**
Q 5	**Consider you are working as a control engineer in a process based industry. Being the control engineer, you have certain responsibilities.** **Write any five responsibilities of the control engineer. Each point has one mark.**	**(5*1=5)**
Q 6	Consider the soft and hard real time classification of real-time systems answer the following: 1. Definition of hard and real time systems 2. Two examples of each hard and real time systems.	**(2*2.5=5)**
Q 7	List down the components of a computer control system. Define these components and mention the objectives of computer-based control.	(10)
Q 8	Describe the data transfer techniques available in process. Present a comparison of these methods. List down the characteristics in data transfer. What is conditional data transfer?	(10)
Q 9	Draw up a list of functions that you would except to find in a real-time operating system. (Write your answer point wise). Identify the functions, which are essential for a real – time system.	(10)
Q 10	Present the differences between following: 1. Multi-user operating system and Multi-tasking operating system	(10)

	2. Static and dynamic priorities	

Q 11	Control design algorithms that are used in computer-based control for any industrial process is very important in order to get the better control of the process. Describe these algorithms in the words without using, diagram, and mathematical expression. Each algorithm should have five points such that these algorithms are explained.
	
	    1. Distributed Control Systems
	    2. DDC and PID Controllers
	
	 OR
	Describe the various methodologies of real-time system development. Mention their names, define the associated terms and list down the various steps.
		(10)

Q 12	Present a detailed case study of any industrial process having computer control, highlight the computer control methods, computer interfacing and communication techniques adopted to control the process. As mentioned in the description this case study should have following four major headings:
	    1. Industrial Process to be controlled including the variables of interest.
	    2. Control methods implemented
	    3. Computer Interfacing methods
	    4. Communication Techniques
	
	Note: You are required to present this case study without numerical expressions and diagrams. The case study should not exceed 900 words.
		(20)