Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal
Second Semester Master of Engineering - ME (Embedded Systems) Degree Examination - April / May 2024
Embedded Software Design [ESD 5203]

Marks: 100   **Duration: 180 mins.**

Thursday, May 02, 2024

Answer all the questions.

1)	a. List the types of embedded software and explain their purpose in detail. L3 CO3 (5 marks)	(10)
	b. Write a short narrative on UML and associated models. L3 CO3 (5 marks)	
2)	Distinguish between association and generalization relationships. Justify the concepts with examples and adequate java code snippets. Draw the UML notations to represent both the relationships L4 CO1 (10 marks)	(10)
3)	Analyze the concept of dynamic method dispatch. Illustrate the concept by providing an example and represent it using UML model. L4 CO1 (10 marks)	(10)
4)	a. Draw a class diagram for the given software requirements. Assume that a class Student contains attributes like name, id, department name. Department class contains attributes as department name and list of student objects. It is associated with student class through its objects. The class Department contains a method which will return list of student type. Institute class contains a list of Department objects and Institute name. It is associated with Department class through its objects L3 CO2 (5 marks)	(10)
	b. Write a short note on Realization/Implementation. L3 CO2 (5 marks)	
5)	Explain sleep(), isAlive(), join() methods of Java. Design a problem statement which adequately creates three threads and uses the above mentioned three methods. Show its implementation in Java. L2 CO2 (10 marks)	(10)
6)	Analyze the two ways of implementing concept of synchronization in multithread programming. L4 CO2 (10 marks)	(10)
7)	Explain the benefits of using lambda expressions with the help of example. L2 CO2 (10 marks)	(10)

8) Discuss the major methods of Timer & TimerTask classes. Write a java program to schedule a periodic task which repeats after every 4 seconds. Initially the task should be functional after a delay of 6 seconds. Depict the classes used in the program and their relationships through a UML class diagram. L3 CO2 (10 marks) (10)

9) Distinguish between a use case, a scenario, and a use case diagram. Explain the importance of keywords "include" and "extends" in a use case diagram with an example L3 CO3 (10 marks) (10)

10) Write the significance of Sequence diagram in UML model. Discuss the different types of messages, creation and destruction of the messages with an example for each. Draw a sequence diagram for multithread programming application, assuming application requires two thread to execute required tasks. L3 CO3 (10 marks) (10)

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