Exam Date & Time: 21-May-2022 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SYSTEM ARCHITECTURE AND DESIGN [ICE 4074]

Marks: 50   **Duration: 180 mins.**

Descriptive

Answer all the questions.   Section Duration: 180 mins

Instructions: Take one of the following projects
1. Railway gate
2. Rocket launch
3. Missile guidance and control
4. Bike speed control

Answer all the project-based question based on one of the projects. All answers should be for the selected project. DO NOT mix projects.

1)   What is Functional Analysis? What are OPM, OPD, OPL? What is a Thing in OPM?
                                                                                                  (3)

2)   Draw an OPM diagram for the project you have selected. Use OPM symbology.
                                                                                                  (3)

3)   Explain the salient objects and processes with respect to the OPM model created for your project. Make it in terms of the requirements as generated by the OPCAT tool. Example: Car consists of chassis, engine and wheels. Driving changes Car from driven to stop, Car from driven to driven.   (4)

4)   Explain the 4 functional elements. Provide examples of the elements.
                                                                                                  (4)

5)   Draw and explain the functional architecture for your specific project.
                                                                                                  (4)

6)   What is allocated architecture?
                                                                                                  (2)

7)   Write short note on **any two** of the following patterns: (a) 3 Tier pattern (b) Model-View-Controller (c) Sense-Compute-Control   (3)

8)   Write short note on **any two** of the following architecture styles, including advantages and disadvantages: (a) Client Server (b) Event Based integration (c) Pipes & Filters   (5)

9)   Define Reliability, Availability, Maintainability
                                                                                                  (2)

10)   What are physical, operational and logical views of the system?
                                                                                                  (2)

11) Draw and explain the operational view for your selected project. (4)

12) Draw and explain the logical view for your selected project. (4)

13) Briefly explain (a) Decision time frame (b) Problem scope and (c) Stakeholder objectives and values with regards to the models for decision making. (3)

14) Why do we need to document the tradeoff analysis? (2)

15) Make two architectures for the project you have selected and do a tradeoff and explain why the selected design is better. (5)

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