Question Paper

Exam Date & Time: 30-Nov-2022 (09:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTRODUCTION TO SYSML AND MBSE [ICE 4075]

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

Descriptive

Answer all the questions. Section Duration: 180 mins

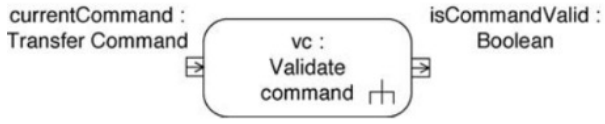
1) Discuss the objectives and purpose of the various steps in ARCADIA workflow, beginning from Operational Analysis and ending with EPBS. (5)

a)

b) Write a short note on different types of relationships between blocks in Block Definition Diagram (3)

c) Discuss the difference on how object tokens are processed at the input pins between the two scenarios depicted below (2)

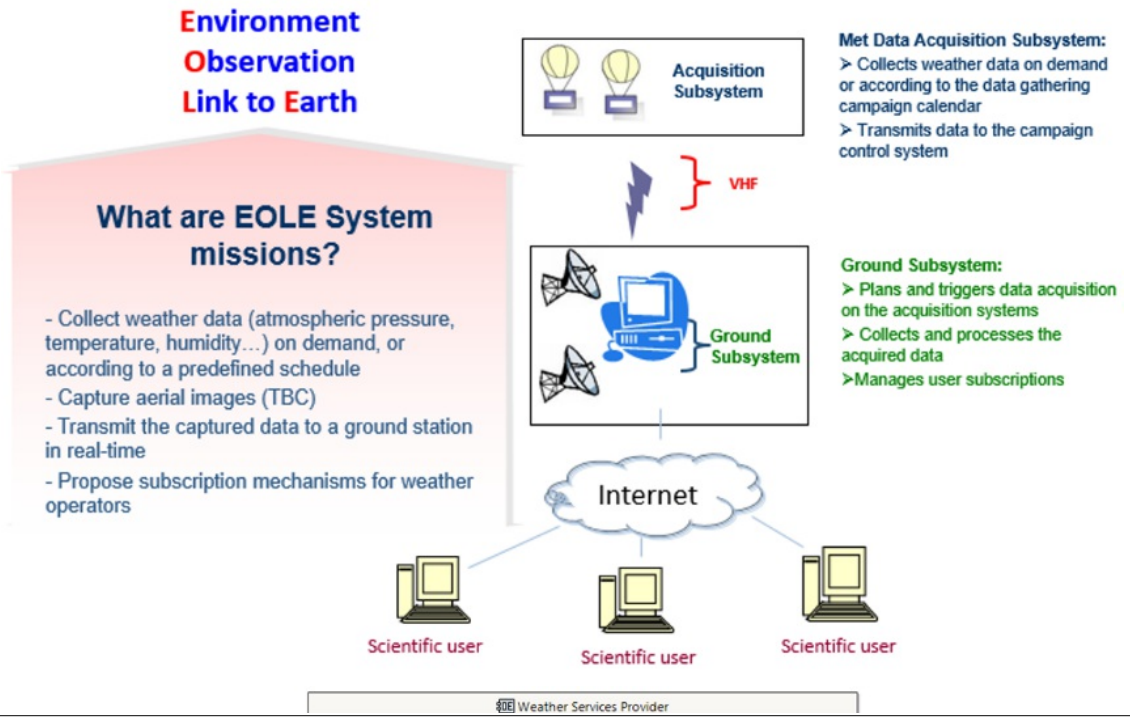
Scenario 1:

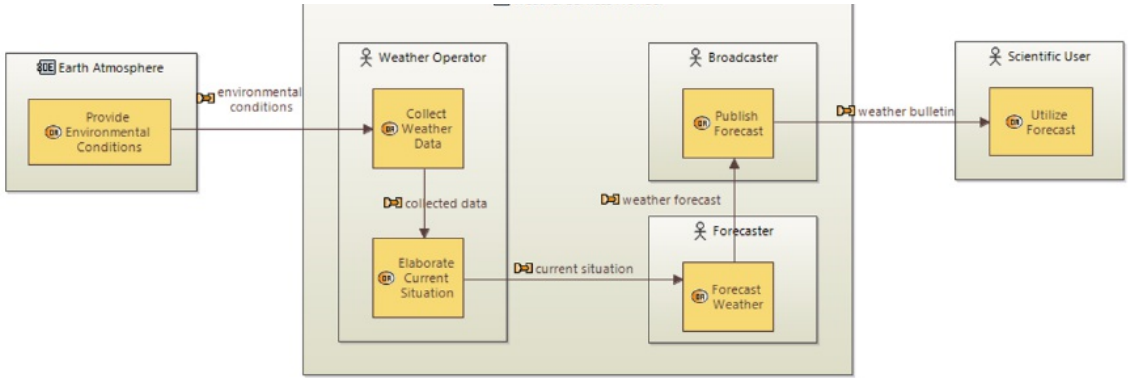


Scenario 2:

2) The first figure below illustrates the Earth Observation Link to Earth (EOLE) system. In this context, discuss the various aspects represented in the OAB - Operational Architecture Diagram illustrated in the second figure (5)

a)





b) What is a viewpoint? Enumerate the properties of viewpoint and describe them (3)

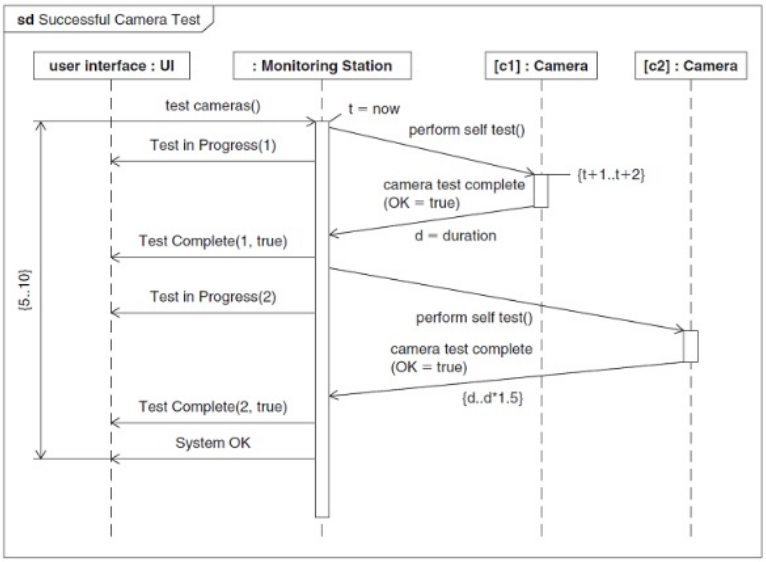
c) Indicate the basic purpose of any TWO of the following diagrams. Block definition diagram; package diagram; sequence diagram (2)

3) Draw a diagram that illustrates the relationships between System, System Architecture, MOEs, Architectural structures and Architecture Design decisions, and discuss the relationships between them from MBSE perspective (4)

a)

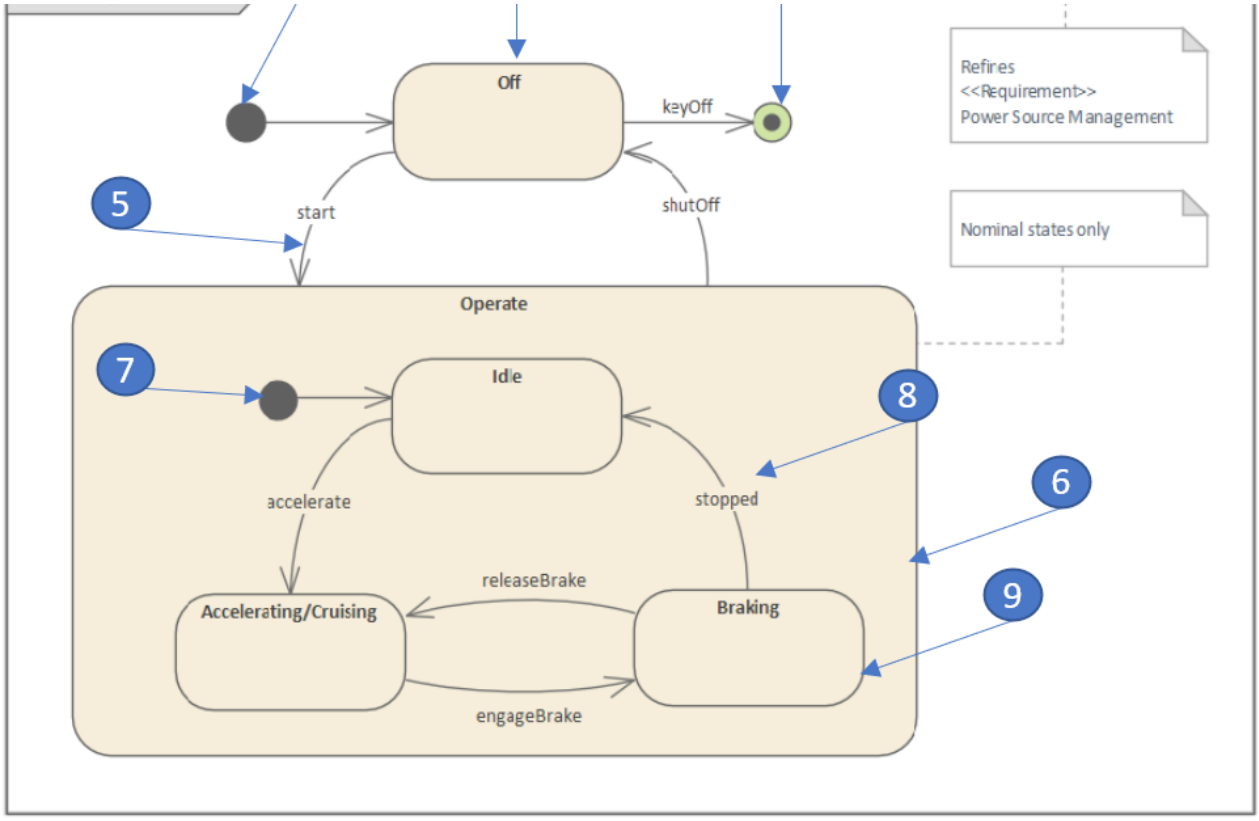
b) Modelling Methods, Modelling Languages and Modelling Tools are considered as the three pillars of MBSE. Discuss on these (3)

c) Analyze the below SysML diagram, and discuss all the various aspects represented in the diagram (3)



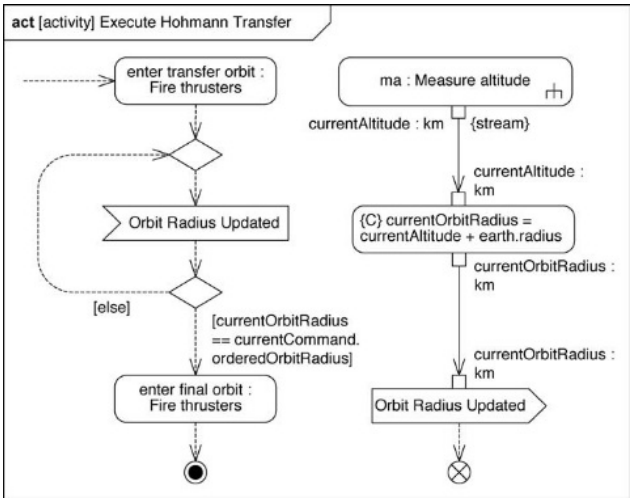
4) Analyze the below SysML diagram, and discuss the various aspects represented in the diagram. Include the inferences pertaining to the labelled elements too (4)

a)



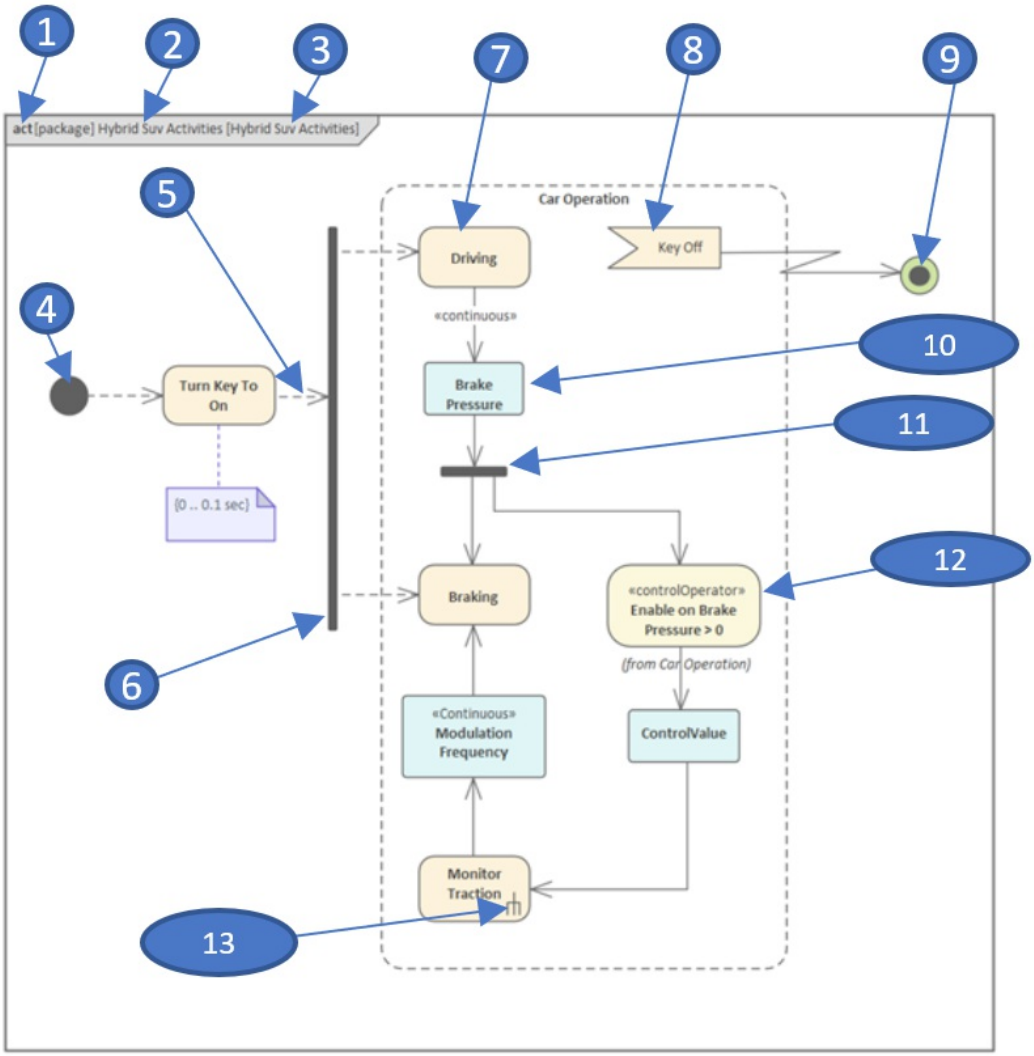
b) Pertaining to a sequence diagram, discuss what is a Combined Fragment. Illustrate with examples four types of operators in combined fragments (4)

c) With respect to the below diagram, discuss Flow final nodes and Activity final nodes (2)



5) Analyze the below SysML diagram, and discuss the various aspects represented in the diagram. Include the inferences pertaining to the labelled elements too (5)

a)



b) Write short note on any three of the following requirements relationships, along with illustrative examples: satisfy, trace, refine, derive (3)

c) With respect to activity diagrams, discuss the conditions that must be satisfied for an action to start (2)

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