Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

SYSTEM VERIFICATION AND VALIDATION [ICE 4076]

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

Descriptive

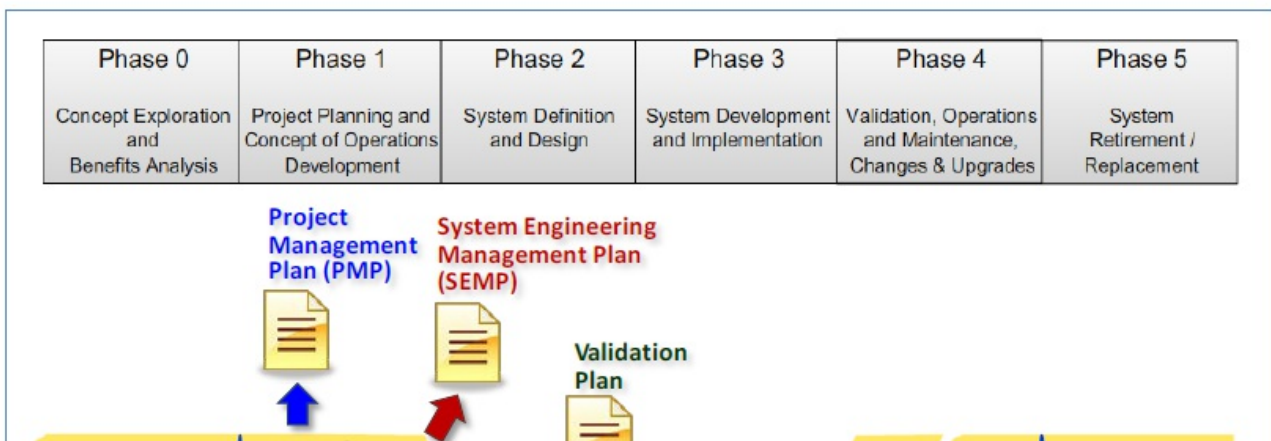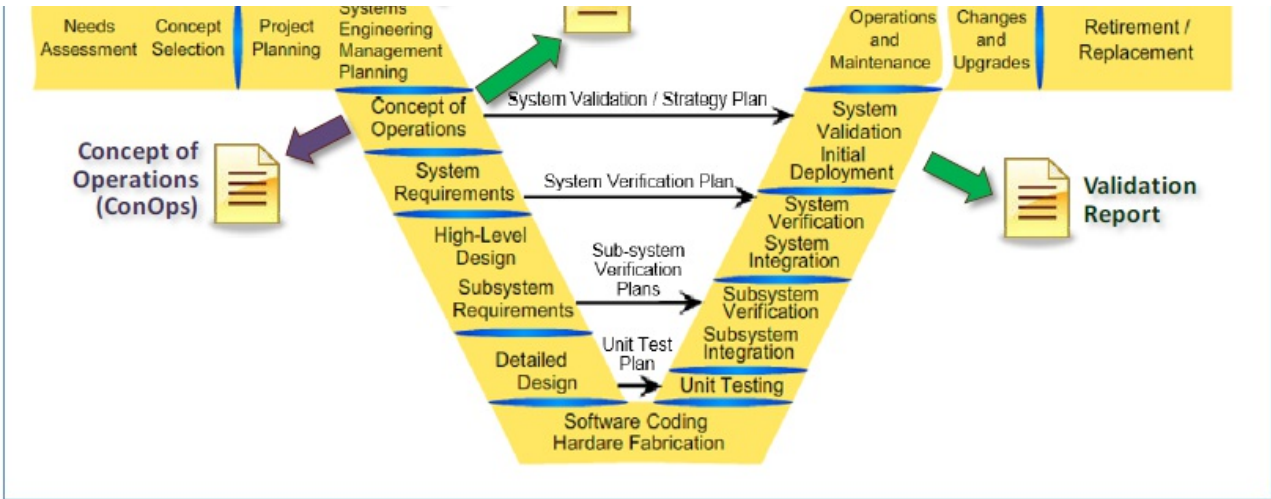**Answer all the questions.**   Section Duration: 180 mins

1)   What is integration testing? What are its advantages?   (3)

2)   What are the various tests carried out under system integration testing?   (3)

3)   Explain the concept of Equivalence Testing with an example. Provide the values that you will use for the test activity in your example with a justification for your value selection. Hint: If it is aircraft autopilot test talk about the values you will use for different altitudes and so on.   (4)

4)   Write short notes on (a) Adaptive Random Testing (b) Error guessing. Provide details why these test methods are useful.   (4)

5)   Write short notes on (a) Covering array testing (b) Orthogonal Array testing. Highlight the major differences between the two.   (4)

6)   Describe how the ACTS tool works in generating these test cases. Discuss in terms of what are the inputs provided and what is the output.   (2)

7)   A autopilot system needs to be tested at different altitudes, speeds, mode of operation in vertical, modes of operation in lateral. There are 3 vertical modes PAH, SPD HOLD, ALT HOLD. There are 3 lateral modes RAH, Heading HOLD, Wings Level Mode. The aircraft flies from ground to 10000 feet altitude above ground and speeds from 100 kts to 200 Kts. What are the boundary values you will select for the tests   (2)

8)   Use the orthogonal array and design a test array for the test activity   (5)

Experiment Number	Column 1	2	3	4
1	1	1	1	1
2	1	2	2	2
3	1	3	3	3
4	2	1	2	3
5	2	2	3	1
6	2	3	1	2
7	3	1	3	2
8	3	2	1	3
9	3	3	2	1

9)   Define Verification and Validation   (3)

10)   Write short notes on the verification methods (a) Analysis (b) Inspection (c) Demonstration (d) Testing   (4)

11)   Describe Validation Plan with respect to the picture provided.   (4)

12)   List out 6 criteria used to assess requirements. (Just list don't describe)   (2)

13)   With respect to the ARP4754 planning process describe ANY THREE (a) Development (b) Safety Program (c) Requirements Management (d) Validation (e) Process Assurance   (3)

14)   What are FHA, PSSA, PASA, CCA?   (2)

15)   Describe the V&V Optimization Strategy. Provide the flow chart and describe the steps. (If drawing boxes is difficult in flow chart just put the text. But show the loops.)   (5)

-----End-----