


VIT

Vellore Institute of Technology

Final Assessment Test – November 2024

Course: CBS1005 - Software Engineering Methodologies

Class NBR(s): 3934/3937

Slot: C1

Time: Three Hours

Max. Marks: 100

- KEEPING MOBILE PHONE/ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions

(10 X 10 = 100 Marks)

1. a) Justify the importance of testing phase in Software Engineering? [4]

b) Computer games are one of the most successful application domains in the history of interactive systems. This success has come despite the fact that games were 'separated at birth' from most of the accepted paradigms for designing usable interactive software. It is now apparent that this separate and less-constrained environment has allowed for much design creativity and many innovations that make game interfaces highly usable. The system analysed several current game interfaces looking for ideas that could be applied more widely to general UIs. Computer games are an enormously popular and successful type of interactive software. This success has occurred even though game interfaces and interaction paradigms are very different from those of other applications. Because of their focus on system performance over consistency, games have nearly always ignored the windowing systems, the standard widget libraries, and the toolkits that define the look and feel of conventional systems.

Select an appropriate process model for the scenario given above. Discuss two key characteristics of the chosen model and include a diagram that illustrates the design of the selected process model.

2. Draw a network diagram for a house construction project. The sequence of activities with their predecessors is given below. Identify all the possible paths and find the Critical path. [4+6]

Name of the Activity	Starting and Finishing Event	Description of activity	Predecessor	Time duration (days)
A	(1,2)	Prepare the house plan	-	4
B	(2,3)	Construct the house	A	58
C	(3,4)	Fix the door/windows	B	2
D	(3,5)	Wiring the house	B	2
E	(4,6)	Paint the house	C	1
F	(5,6)	Polish the doors/windows	D	1

3. a) List out any 2 functional requirements and 2 non-functional requirements in order to improve the quality of an existing system of Q.No.1.b. Explain accordingly. [5]

b) Draw the 1st Level DFD system model using proper notations for Q.No.1.b. [2]

4. a) Fill up the blanks:

i) The process of managing and controlling software versions and configurations is called _____

ii) A _____ diagram shows the interaction between a user and the system. [3]

b) State True or False:

i) Software engineering does not require documentation.

ii) Debugging is the process of finding and fixing defects in the software.

iii) Software maintenance involves modifying software after delivery to correct faults or improve performance. [3]

c) Match the following:

Column A	Column B
1. Version Control System	a) The ability of a system to continue operating despite failures.
2. Fault Tolerance	b) An iterative software development model focused on risk analysis.
3. Dynamic Testing	c) Testing with an understanding of the internal workings of the software.
4. Spiral Model	d) Testing that involves executing the code to verify functionality.
5. White Box Testing	e) A tool used to manage changes to source code over time.

5.a) i) Identify any three suitable design mantra and tabulate the measurement of the functional independency between the modules (Ex: Low/high) for the system given in Q.No.1.b. [5]

ii) "Model the behavior of a system in response to internal or external events"- Justify the statement with an appropriate design model using proper notations for the system given in Q.No.1.b. [5]

OR

- b) i) Identify any three suitable design mantra and tabulate the measurement of the functional independency within modules (Ex: Low/high) for the system given below: [5]

The system started out as a classic A/C modification by adding a thermo regulator and maintaining a comfort temperature in our surrounding with respect to the room temperature. There are lots of techniques implemented to control the combination of cooling and heating element, which makes it more automated. Further it can be controlled and monitored by using IOT technology. The air conditioning with the help of this proposed system makes us more comfort throughout the year irrespective to the climatic condition. The combination of heating and cooling unit into a single air conditioner makes our device to be a portable one.

- ii) "A Visual representation of the behavior of a system"-Justify the statement with an appropriate design model using proper notations for the system given in Q.No.5.b).(i). [5]

6. How can we reduces telephone waiting time of BPO Call system? Apply any four tools for continuous improvement of Quality of BPO System with proper diagrams. Explain in detail.

- a) Process flow chart
- b) Run diagram
- c) Control charts
- d) Fishbone
- e) Check sheet
- f) Histogram
- g) Pareto analysis

7. The following pseudocode implements the triangle problem.

```
read a,b,c
type="scalene"
if(a==b | b==c | a==c)
type="isosceles"
if(a==b&&b==c)
type="equilateral"
if(a>=b+c | b>=a+c | c>=a+b)
type="not a triangle"
if(a<=0 | b<=0 | c<=0)
type="bad inputs"
print type
```

- a) Construct a control flow graph. [3]
- b) Compute the cyclomatic complexity of the constructed graph. [3]
- c) Derive the test cases to validate any one condition. [4]

8. a) Why software maintenance is necessary and explain their inter-relationship between maintenance factors in software engineering briefly? [5]
- b) Compare and Contrast Version and Release in Software Configuration Management of Software Engineering? Explain briefly. [5]

9. Design a Hybrid work breakdown structure for the system given in Q.No. 1.b. with proper notations. Explain in detail.

10. a) i) Consider a system given below and design the appropriate design models for the statement, "Shows how objects communicate with each other over time" with proper notations and explain briefly. [6]

Any library member should be able to search books by their title, author and subject category as well by the publication date. Each book will have a unique identification number and other details including a rack number which will help to locate the book. There could be more than one copy of a book, and library members should be able to check-out and reserve any copy. We will call each copy of a book, a book item. The system should be able to retrieve information like who took a particular book or what are the books checked-out by a specific library member. There should be a maximum limit on how many books a member can check-out. The system should be able to collect fines for books returned 2 after the due date. Members should be able to reserve books that are not currently available. The system should be able to send notifications whenever the reserved books become available, as well as when the book is not returned within the due date. The system will be able to read barcodes from books and members' library cards.

- ii) Identify any two User Interface features for an interface given below and explain briefly. [4]

The screenshot displays the IRCTC website's 'BOOK TICKET' section. At the top, there is a navigation bar with links like LOGIN, REGISTER, AGENT LOGIN, CONTACT US, DAILY DEALS, ALERTS, and a date/time stamp. Below this, a secondary bar lists various services: IRCTC EXCLUSIVE, TRAINS, LOYALTY, IRCTC eWallet, BUSES, FLIGHTS, HOTELS, HOLIDAYS, MEALS, PROMOTIONS, and MORE. The main content area is titled 'BOOK TICKET' and features a form with fields for 'From', 'To', 'Journey Date' (set to 14/10/2024), and 'Classes' (set to All Classes). There are also checkboxes for 'GENERAL', 'Person With Disability Concession', 'Flexible With Date', 'Trains with Available Berth', and 'Railway Pass Concession'. A 'Search' button is at the bottom left. On the right, there is a large image of a train with the text 'INDIAN RAILWAYS' and 'Safety | Security | Punctuality'.

OR

- 10.b) i) Consider a system given in Q.No.10.a).i) and design the appropriate design models for the statement, **“Can be used to break out the activities that occur within a use case”** with proper notations and explain briefly. [6]
- ii) Identify any two User Interface principles for the interface given below and explain briefly. [4]

