Roll Number:

Thapar Institute of Engineering and Technology, Patiala

Computer Science & Engineering Department

BE -4th Year — ENC

EST Date- 16 December 2020   **Time: 2 hours MM: 50**

Course Code: ███████   **Course Name: Software Engineering**

Instructors: **Dr. Seema Bawa, Dr. Ashima Singh, Dr. Vinod Kumar Bhalla,**

        Ms. Chinu Singla,   Mr. Amit Kumar Trivedi

Note: Attempt any 5 questions.

1. Differentiate between the following: **(10)**

a) Incremental and Iterative Process   b) Variant and Version

c) Regression Testing and Smoke Testing   d) Verification and Validation

2. The Online Confectionery System allows both Customers and Administrators to access it as separate users with different menus and functions in both cases.

Existing customers are required to log in through the login Ul, and upon being logged in, they are remembered as a User. New customers are able to register for a new account at the signup UI. Once the customer is logged in, they will be directed to the customer user interface (UI) where they can choose to order a default cake or customised cake. After the customer has decided on the cakes of choice, they can then be added to a cart. From this cart, the customer is able to choose between two payment methods, either by credit card or by eNets, and they will be directed to a payment UI which is either a credit card UI or eNETs UI. Once the payment is successful, customers will then be able to choose to play between two games, either Treasure Chest or Cake world of the games award customers with discount for future visits. Bakery administrator need to be able to place/remove products from orders through smart phone. In each database, administrators can then perform various functions like add, edit or delete entries. Administrators are also able to create a transaction log using a transaction log creator. Clients should be able to report how many items were received. All orders on particular date should be visible in same place in separate tab so driver and bakers know what is ordered for a particular date and by whom without need to go in to each separate client.

a). Identify and list perspective classes.   **(3)**

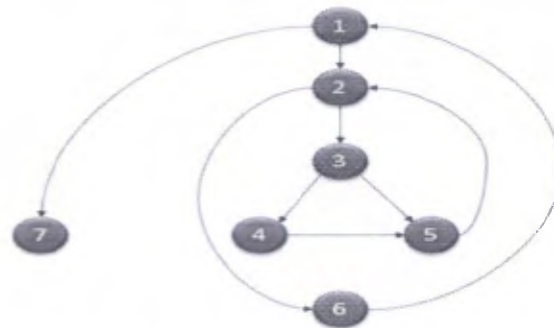**b).** Draw the Use Case Diagram.   **(7)**

3. a). Discuss 3-Tier and Model View Controller architecture by giving suitable example of each.   **(6)**

b). How to transform/map requirement analysis model into design model, explain with suitable diagram.   **(4)**

4. a) Consider the following flow graph. (7)

    i) Calculate the V(G) for the following flow graph using three different techniques.

    ii) Give different independent paths.

    iii) How many test cases are required?

b) Explain Equivalence Class Partitioning Testing method giving suitable example   **(3)**

5. a) Waterfall model is mostly suitable for database specific projects but it is not the best choice always. Justify this statement. Also, suggest specific situations when you should opt for iterative or RAD model.   **(5)**
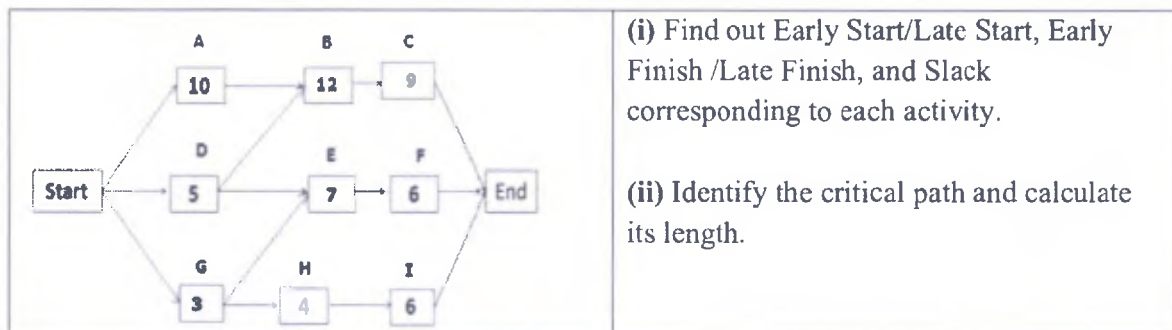
    b) Modularity affects development cost as well as integration cost. Explain it briefly with help of suitable diagram   **(5)**

6. Compute the function point value for a project with the following information, for size estimation.   **(10)**

1. No. of User Inputs: **50**;   *2. No. of User Outputs*: **40**;   *3. No. of Enquiries:* **35**;

4. No. of Internal Logical Files: **06**   *5. Number of External Interfaces Files:* **04**

    Assume all complexity adjustment values as moderate and weights have high values.

7. a) For the following network: **(7)**

	(i) Find out Early Start/Late Start, Early Finish /Late Finish, and Slack corresponding to each activity. **(ii)** Identify the critical path and calculate its length.

b) Mention all the Software Configuration Items (SCIs) constructed during each stage of traditional Software Development Life Cycle.   **(3)**

Roll Number:

Thapar Institute of Engineering and Technology, Patiala

Computer Science & Engineering Department

BE CoE and ENC Third Year   Course Code: UCS 503
EST- January 27, 2021   Course Name: Software Engineering
Time: 2 Hours; MM: 50   Instructors: SB, ASH, VBH, AKT, CS

Note: Attempt any 5 questions.

1. Differentiate between the following giving a suitable example.   **(10)**

a) Throw Away vs. Evolutionary Prototyping   b) Verification and Validation

c) Performance Testing and Recovery Testing   d) Functional vs. Non Functional Requirements

2. a). How iterative approach of software development differs from the incremental approach?   Explain with a suitable example.   **(5)**

   b). Discuss SCRUM along with a suitable diagram while explaining important features and terms. Also comment on risk mitigation in SCRUM approach.   **(5)**

3. Trending Fashionista is a mail order supplier of high-quality, fashionable clothing and accessories. It provides three different mode of ordering the stuff. Customers place orders by telephone, by mailing an order form included with each catalog, or via the Web site. When customer orders come in, the item master and the customer master files are both updated. If an item is out of stock, the inventory control department is notified. If the order is from a new customer, a new record is created in the customer master file. Picking slips are produced for the customer order and sent to the warehouse. A shipping statement is prepared. The process of shipping a customer order involves getting the goods from the warehouse and matching up the customer shipping statement, getting the correct customer address, and shipping it all to the customer. The customer statement is generated and a billing statement is sent to a customer once a month. An account receivable report is sent to the accounting department.

   a). Which diagram is best suited to explain product scope while following structured analysis and design approach?   **(1)**

   b). Which usecase relationship can be used to show the three different mode of ordering? Show with a suitable example.   **(2)**

   c). Draw the Context Level Diagram along with Data Flow Diagram Level 1.   **(2,5)**

4. a). Give steps followed for managing and controlling changes to Software Configuration Items.   **(3)**

   b). Compute the Function Point value for a project with the following details of functional units.

1. *No. of User Inputs:* **60**;   2. *No. of User Outputs:* **70**;   3. *No. of Enquiries:* **45**;

4. *No. of Internal Logical Files:* **10**   5. *Number of External Interfaces Files:* **09**

Assume all complexity adjustment values as moderate and weights have high values.   **(07)**

5. a) Draw the **State Chart Diagram** for the Weather Monitoring System. The monitoring object responds to different service requests and state transitions triggered by these requests. The paused monitoring system will starts if it receives a Startup message. It will remain in waiting state until it receives any of these signals/ messages (Test, Report weather, Clock Signal, Calibrate). A collecting state is entered when a clock **(PTO)**

signal is received. After collection, it will again move to waiting state. If reportWeather message is received, the system moves to summarising state. It will transmit the data before moving to waiting state again. If calibrate message is received, the system moves to calibrating state. Testing state requires calibration OK and test message for transmission to trigger. (5)

b) In carrying out software engineering activities establish the significance of Software Requirement Specification (SRS) document. (5)

6 a). Discuss equivalence partitioning and Boundary Value Analysis giving suitable example of each. (3)

b). Consider the following Code Snippet. (2,3,1,1)

```
Code Snippet
while(x<100)
   {
   if(a%2==0){
     parity=0;}
   else{
     parity=1;
     }
   switch(parity)
     {
     case 1:  println("[a["+i+"]is even");
     case 2:  println("[a["+i+"]is odd");
     default: println("Error");
     }
   x++;
   }
```

i)   Draw a flow graph for the above code.
ii)   Calculate the Cyclomatic Complexity for the flow graph using three different techniques.
iii)   Give different independent paths.
iv)   How many test cases are required

7. Consider the following activities with duration (3,3,2,2)

Activity	Precedence	Duration
P	-	3
Q	-	4
R	P	5
S	Q	5
T	R,S	7
U	R,S	5
V	T	2
W	U	10

i)   Draw the Network Diagram using Activity on Arc.
ii)   Find out Early Start/Early Finish, Late Start/Late Finish, and Slack time corresponding to each activity. Show in a Table.
iii)   Identify the 'critical path' and calculate its length.
iv)   How are 'float' and 'project finish time' related?