Roll No:
(To be filled in by the candidate)

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

SEMESTER EXAMINATIONS,   APRIL 2019

MSc - SOFTWARE SYSTEMS   Semester : 4

15XW45   SOFTWARE ENGINEERING TECHNIQUES

Time : 3 Hours   **Maximum Marks : 100**

INSTRUCTIONS:

1. Answer **ALL** questions. Each question carries 20 Marks.
2. Subdivision (a) carries 3 marks each, subdivision (b) carries 7 marks each and subdivision (c) carries 10 marks each.
3. Course Outcome :

Table	Qn.1	CO1.	Qn.2	CO4.	Qn.3	CO5.	Qn.4	CO.2	Qn.5	CO3.

1. a) Sometimes a part of a system may be built quickly to demonstrate feasibility or functionality to a customer. This prototype system is usually incomplete; the real system is constructed after the customer and developer evaluate the prototype. Should the system requirements document written before or after a prototype is developed? Why?

   b) An unattended petrol bunk system, includes a credit card reader. The customer swipes the card through the reader and then specifies the quantity of fuel required. The fuel is delivered and the customer's account is debited.

   (i) Suggest which kind of prototype is suitable for the above application

   (ii) Suggest at which stage of software development life cycle a prototype will be useful.

   c) A software has to be developed which will extract employee records from the employee data base who are eligible for income tax deduction. The Employee Identification number, Name and department details will be taken from the employee database. A report has to be printed showing Id number, Name, department, Gross salary and income tax amount to be deducted.

   Assume that the report is complex and other elements are of average difficulty. An option is required to view the details of income tax for a given employee on the screen. Estimate the effort required for developing this system using an appropriate estimation method. Specify the assumptions you have made during this estimation process.

2. a) Consider the requirement given below :

   "The system should be able to complete the process and display the result on the

   monitor within 5 seconds"

   Is it a functional or non-functional requirement?

b) It is proposed to develop a system for stock information where people can access information about companies and can evaluate various investment scenarios using a simulation system .

(i) Which process model is the best for developing the given system specification?(3)

(ii) State two reasons for selecting this process model for given specification.   (4)

c) The description of Patient Information System (PIS) is given below :

The software is to be used to keep track of the patients registering in a hospital or clinic. Also this system supports accessing the previous visit histories of any patient, search for patients by name and other properties, etc.

Patient Information System – Requirements

PIS will support registering patients.

Patients are categorized into "In Patients" and "Out Patients".

Users of this software can search for patients by name, admission date,

discharge date, etc.

Users can view the previous visit histories of any patient.

System can maintain the list of doctors in the hospital.

PIS can maintain the list of beds/rooms available in the hospital.

Draw a neat Structure Chart and HIPO diagram for the above system.

3. a) Are there some systems that cannot be made completely functionally cohesive? Why or why not ?

b) There are approximately 1000 employees in an organization. All the employees are having a unique employee-id. The employees should be able to view their attendance status by typing their employee-id at any point of time. The output should be displayed within 20 seconds. Identify the

(i) "requirement" of the given scenario   (3)

(ii) "specification" from the above scenario.   (4)

c) Consider the "Computerized Railway Ticket vending machine to replace the existing Railway Reservation system. This is similar to an ATM for money transactions. Construct the Data Flow diagram and Entity Relationship diagram for this application. State the assumptions made regarding this application.

4. a) Why should error messages displayed on the screen match users' skill and their experience?

b) Derive a set of test cases for the following components :

(i) A routine which takes a line of text as input and counts the number of non-blank characters in that line.

(ii) A routine which examines a line of text and replaces sequences of blank characters with a single blank character.

c) You have been hired by a Computer consulting firm to develop an Income tax calculation package for an accounting firm.

i)   What will the input screens look like?

ii)   What reports will be produced?

iii) Represent the code using Nassi-Shneiderman diagram.

5. a) One of the user requirements, captured during requirements analysis stage, was not implemented by mistake. It was added after six months of implementation. Is it a maintenance activity?

   b) (i) Why it is practically impossible to exhaustively test a program ?   (3)

   (ii) Distinguish between portability and interoperability.   (4)

   c) A retail store wanted to automate their operations with the following requirements :

   • Products (items) are purchased from various suppliers based on the stock and reorder level

   • Payment time for each purchase is 30 days from the date of billing

   • Store has multiple billing counters which accepts cash and credit card.

   • Purchase value above Rs. 2000 is eligible for a free home delivery.

   Apply relevant testing methodology to test the above application and tabulate test cases planned and the results.

/END/

FD/RL