END SEMESTER EXAMINATION   *May-2019*

SE202 SOFTWARE ENGINEERING

Time: 3:00 Hours   *Max. Marks: 40*

Note: Question 1 is compulsory. Answer any *FOUR* questions from the remaining questions. Assume suitable missing data, if any.

1[a] Attempt all questions
   i.   Differentiate between program and software.   (2)
   ii.   What is productivity? How is it related to effort? What is the unit of effort?   (2)
   iii. Differentiate between functional and structural testing   (2)
   iv.   Differentiate between corrective and adaptive maintenance. (2)

2 [a] Compare iterative enhancement model and evolutionary process model.   (4)

  [b] List the advantages and disadvantages of waterfall model. (4)

3   'Pragati Apartments' is a company that gives an apartment on lease to the customers. This company owns multistoried buildings in various locations in Delhi. Each building consists of a number of apartments that are classified into the following types:
   • Type 1- 4 bed roomed apartment with 3 attached bathrooms and 1 guest room.
   • Type 2- 3 bed roomed apartment with 2 attached bathrooms
   • Type 3- 2 bed roomed apartment with 1 attached bathroom.
   • Type 4 – 1 bed roomed apartment.

Each apartment consists of a dining area, a kitchen and a parking space for one vehicle. Each building and apartment has unique identification numbers. At a given time an apartment may be available, unavailable or reserved.

The customer signs a lease agreement consisting of terms and conditions and expiry date of the agreement.

The receptionist must be able to provide information about the availability of an apartment. She must also provide information about location, deposit amount, number of rooms and other relevant information about the desired apartment to the customer. If the apartment is not available the customer must be able to reserve the apartment and he will be in the waiting list. The applications are served on first come first served basis.

Consider the case study given above. Draw DFD upto level 2. (8)

4. [a] Explain all the levels of COCOMO model. Assume that the size of an organic software product has been estimated to be 25K lines of code. Determine the effort required to develope the software product and the nominal development time. (4)

   [b] Define coupling and explain different types of coupling. (4)

5. [a] What is design? Describe the difference between conceptual design and technical design. (4)

   [b] Assume that the initial failure intensity is 5 failures / CPU hr. The failure intensity decay parameter is 0.01 / failure. We have experienced 25 failures upto this time. Find the failures experienced and failure intensity after 30 and 60 CPU hrs of execution. (4)

6. [a] Consider a program for the classification of a triangle. Its input is a triple of positive integers (say, a, b, c) from the interval [1, 100]. The output may be one for the following words [scalene, Isosceles, Equilateral, Not a triangle]. Design the boundary value test cases, worst case test cases. (4)

   [b] Differentiate between unit, integration and system testing. (4)

7. [a] What is software refactoring? Describe reengineering process, (4)

   [b] Annual Change Traffic (Act) in a software system is 25% per year. The initial development cost was Rs. 10 lacs. Total lifetime for the software is 10 years. What is the total cost of the software system? (4)