

Please check that this question paper contains 09 questions and 2 printed pages within first ten minutes.

[Total No. of Questions:09]

EVENING

[Total No. of Pages: 2]

Uni. Roll No.

08 JUL 2022

Program: B.Tech. (Batch 2018 onward)

Semester: 4

Name of Subject: Software Engineering

Subject Code: PCCS-107

Paper ID:16217

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Illustrate the situations to apply the RAD model of software development.
- b) What are the objectives of PSP model?
- c) What is the need for Sanity checks during software product development?
- d) An organic software product must be developed by a corporation. A 30000 line code count is anticipated for the app. Using the COCOMO model in its most basic form, calculate the number of person-months needed to develop this software. Let's say a software engineer's salary is Rs. 5000 per month. How much would the software construction cost, on average? Find out the duration you think the project will take. The basic COCOMO equation's constants are specified as $a_b = 2.4$, $b_b = 1.05$, $C_b = 2.5$, and $d_b = 0.38$ for software development in organic mode.
- e) Compare functional and non-functional requirements.
- f) Draw the structure chart for the following program snippet:

```
int num1, num2;
int calculateAverage()
{ int avg;
  inputNums();
  avg = average(num1, num2);
  outputAvg(avg);}
int average(int a, int b)
{return (a + b) / 2;}
void inputNums()
{ scanf("%d", &num1);
  scanf("%d", &num2);}
void outputAvg(int x)
{ printf("average = ", x);}
```

Part – B

[Marks: 04 each]

- Q2.** Demonstrate the process of software evolution with respect to maintenance and change management.

08 JUN 2022

- Q3. Comment on the following statement: **"Software Risk Management is crucial for effective software development and if taken leisurely could cost heavy"**.
- Q4. Illustrate the differences between White-box and Black-box testing techniques giving suitable test cases.
- Q5. State two methods for computing Cyclomatic Complexity of a program. Calculate the Cyclomatic Complexity for the following program fragment by drawing the flow graph:
- ```

IF A = 354
THENIF B > C
THEN A = B
ELSE A = C
ENDIF
ENDIF
PRINT A

```
- Q6. **"Product prototyping is thought to require reverse engineering"**. Discuss an example case to support this statement.
- Q7. A small project consisting of ten activities has the following characteristics: Determine the critical path and the estimated length of the critical path (in weeks)

| Activity | Preceding Activity | Time Estimate weeks |             |             |
|----------|--------------------|---------------------|-------------|-------------|
|          |                    | Optimistic          | Most Likely | Pessimistic |
| A        | -                  | 4                   | 5           | 12          |
| B        | -                  | 1                   | 1.5         | 5           |
| C        | A                  | 2                   | 3           | 4           |
| D        | A                  | 3                   | 4           | 11          |
| E        | A                  | 2                   | 3           | 4           |
| F        | C                  | 1.5                 | 2           | 2.5         |
| G        | D                  | 1.5                 | 3           | 4.5         |
| H        | B, E               | 2.5                 | 3.5         | 7.5         |
| I        | H                  | 1.5                 | 2           | 2.5         |
| J        | F, G, I            | 1                   | 2           | 3           |

**Part – C**

[Marks: 12 each]

- Q8. Diagrammatically outline various software design process activities along with its outputs depicting relationships among these activities.
- OR**
- Compare the benefits of employing the spiral model of software development vs the iterative waterfall technique while creating MIS applications.
- Q9. Discuss the main characteristics of a data model for requirements engineering.
- OR**
- Elaborate the concept of Coupling and Cohesion in software design. Discuss the ideal requirement of Cohesion and Coupling for a good software design by giving example of low and high cohesion among modules.

\*\*\*\*\*