

CS/B.Tech/CSE/Odd/Sem-7th/CS-701/2015-16



**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY,
WEST BENGAL**

CS-701

SOFTWARE ENGINEERING

Time Allotted: 3 Hours

Full Marks: 70

*The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.*

**GROUP A
(Multiple Choice Type Questions)**

1. Answer all questions.

10×1 = 10

(i) One way to improve readability in coding is to

- ☒ (A) avoid goto statements
- ☐ (B) name variables and functions according to their use
- ☐ (C) modularize the program
- ☐ (D) none of these

(ii) The type of failure that occurs for all input values while invoking a function of the system is

- ☐ (A) transient failure
- ☒ (B) permanent failure
- ☐ (C) recoverable failure
- ☐ (D) unrecoverable failure

(iii) According to COCOMO number of cost drivers is

- ☐ (A) 10
- ☐ (B) 15
- ☐ (C) 20
- ☒ (D) 14

7001

1

Turn Over

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(iv) The best type of cohesion is

- ☐ (A) coincidental
- ☐ (B) logical
- ☐ (C) informational
- ☒ (D) functional

(v) A physical DFD specifies

- ☐ (A) what processes will be used
- ☒ (B) who generates data and who processes it
- ☐ (C) what each person in an organisation does
- ☐ (D) none of these

(vi) Function point describes

- ☐ (A) the SRS document
- ☐ (B) the test plans
- ☐ (C) the functional decomposition
- ☒ (D) the size of a software product directly from its specification

(vii) Efforts are measured in terms of

- ☒ (A) Person-months
- ☐ (B) Persons
- ☐ (C) Rupees
- ☐ (D) Months

(viii) Which form of software development model is most suited to a system where all the requirements are known at the start of a project and remain stable throughout the project?

- ☒ (A) Waterfall model
- ☐ (B) Incremental model
- ☐ (C) Evolutionary model
- ☐ (D) Spiral model

(ix) Which is not a size measure for software?

- ☐ (A) LOC
- ☐ (B) Function count
- ☒ (C) Cyclomatic complexity *part of white box testing*
- ☐ (D) Halstead's program length

7001

2

(x) The cyclomatic complexity of the following program fragment is:

```
int gcd (int x, int y) {
    while (x != y) {
        if ( x > y ) then
            x = x - y;
        else y = y - x;
    }
    return x;
}
```

Answer seems 3

- (A) 2 (B) 3 (C) 4 (D) 5

GROUP B
(Short Answer Type Questions)

Answer any *three* questions.

3×5 = 15

2. What are Cohesion and Coupling? Mention different kinds of cohesion. 2+3
3. What is Use Case diagram? Draw the Use Case diagram of Hospital Management System. 1+4
4. (a) Define software quality. 2+3
 (b) It is estimated that there will be 70 errors in a software. During testing 25 errors have been experienced. Calculate the failure intensity with a given value of $\phi = 0.03$ using Jelenski Moranda model. What will be the failure intensity after experiencing 50 errors?

5. What are different levels of Testing and their goals? 5
6. The size of an organic type software product has been estimated to be 1,00,000 lines of source code. The average salary of software developers is Rs.10,000/- per month. Determine the effort required to develop software product, the nominal development time and the cost to develop the product. 5

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.

3×15 = 45

7. (a) What is meant by a Stub? What is a Driver? 1+1
- (b) With some suitable examples, explain statement coverage, branch coverage, and path coverage criteria. 2+2+2
- (c) Design a white box test suite for the following piece of C code: 7

```
int binary_search (int num)
{
    int min, max;
    min = 0;
    max = 100;
    while (min != max) {
        if (arr[(min + max)/2] > num)
            max = (min + max)/2;
        else if (arr[(min + max)/2] < num)
            min = (min + max)/2;
        else return ((min + max)/2);
    }
    return (-1);
}
```

The suite should include Control Flow Graph, Independent Path, and Cyclomatic Complexity (using two different techniques).