

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc
BRANCH: MATH & COMPUTING

SEMESTER : VII
SESSION : MO/2023

SUBJECT: CA505 SOFTWARE ENGINEERING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

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|--|-----|----|----|
| Q.1(a) Define the stages of classical waterfall model. | [2] | 1 | 1 |
| Q.1(b) Consider a basic COCOMO model for an embedded software system, where there are 60000 lines of code. What should be the approximate time and effort to develop it? | [3] | 2 | 3 |
| Q.1(c) Time – Estimates (in weeks) | [5] | 2 | 3 |

Activity	Preceding activity	Most optimistic time (a)	Most likely time (m)	Most Pessimistic time (b)
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

Compute the Slack.

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|---|-----|---|---|
| Q.2(a) What are the seven distinct tasks of requirement engineering | [2] | 1 | 1 |
| Q.2(b) Differentiate the problem of scope, the problem of understanding, and the problem of volatility. | [3] | 1 | 2 |
| Q.2(c) Create a scenario based requirement model for a web-based chatting software. Create a preliminary use case and refine it by appropriate questions. | [5] | 3 | 6 |
| Q.3(a) Differentiate analysis and design. | [2] | 1 | 1 |
| Q.3(b) Explain different types of cohesion and coupling. State which are preferred. | [4] | 1 | 2 |
| Q.3(c) With an example, differentiate between functional and object oriented design. | [4] | 3 | 4 |
| Q.4(a) Explain alpha and beta testing. | [2] | 1 | 1 |
| Q.4(b) Differentiate and explain different integration testing approaches. | [3] | 2 | 2 |
| Q.4(c) Write a C program to check if someone can vote (based on age 18). Compute the testing scenarios and Cyclomatic complexity. | [5] | 4 | 3 |
| Q.5(a) Provide a justification on why quality control in software industries is more complex than hardware industries. | [2] | 2 | 2 |
| q.5(b) Explain and draw the relationships between mean time to failure (MTTF), mean time to repair (MTTR), and mean time between failure (MTBF). | [3] | 2 | 2 |
| Q.5(c) Write a C program to compute the minimum of an array. Compute the volume, difficulty, and effort from Halstead's software metrics. | [5] | 4 | 3 |