ABV-Indian Institute of Information Technology and Management Gwalior

Exam: Mid-Term | Subject: Software Engineering | Batch: 2023 BMS

Time: 2 hours | Date: 25-02-2025 | M.M.: 35

Note: Attempt all questions **(Calculator is allowed)**

Q.1 Discuss the iterative enhancement model and spiral model for the software life cycle with schematic diagrams. Compare both models. (6)

Q.2. (a) What are the goals of the requirements analysis and specification phase? Discuss the software Requirements Gathering Activities.

(b) Draw a decision tree of the SRS document of library management software. (3+3)

Q.3 (a) Write down the equations of the basic constructive cost model (COCOMO) for (i) the effort applied in person-months with respect to K-lines of code and (ii) the development time in months. Also, write expressions of (iii) average staff size and (iv) productivity in terms of effort and development time.

(b) Given basic COCOMO coefficients in the following table:

Project modes	a	b	c	d
Organic	2	1.1	3	0.4
Semi-detached	2.5	1.2	3	0.35
Embedded	3	1.3	3	0.3

Suppose that the project was estimated to be 300 KLOC. Calculate the effort, development time, average staff size and productivity for the organic and embedded modes. (3+5)

Q.4. (a) Write down the expression for the system's mean time to failure (MTTF) and mean time to repair (MTTR) for continuous distributions.

(b) Write the expression for system reliability and hazard function in the Weibull Distribution. The failure time of a certain component has a Weibull distribution with $\beta = 4$, $\theta = 1000$, and $\gamma = 1200$. Find the reliability of the component and the hazard rate for an operating time of *1500* hours. (2+5)

Q.5. (a) Explain the basic steps in PERT/CPM techniques.

(b) Determine the early start and late start with respect to all node points and identify all critical path(s) for the following network: (3+5)