ABV-Indian Institute of Information Technology and Management Gwalior

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

Time: 3 hours | Date: 02-05-2025 | M.M.: 50

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

Q.1 (a) Discuss the different phases of software life cycle.
(b) Describe the rapid application development (RAD) model for software. Sketch a neat diagram of RAD model.
(c) Compare iterative enhancement model and RAD model. (3+3+3)

Q.2. Write down a short note on **Halstead's** Software science analytical technique to measure. In a sorting program the following operators and operands are given in table:

Operators	Occurrence	Operands	Occurrence
int	4	SORT	1
()	5	x	7
,	4	n	3
[]	7	i	8
if	2	j	7
<	2	save	3
;	11	im1	3
for	2	2	2
=	6	1	3
-	1	0	1
<=	2		
++	2		
return	2		
{ }	3		
Total η_1 =	N_1 =	η_2 =	N_2 =

Find (i) The program length (N) , (ii) Total vocabulary of the program (η), (iii) volume (V), (iv) If given potential volume (V^*)= $5\log_2(5)$, estimate program level, (v) Effort (E) (7)

Q.3. (a) Several quality factors are associated with a software product, list down at least five modern views of quality factors. Shortly explain each factor.
(b) Write a short note on quality assurance and total quality management in software engineering. (4+4)

P.T.O.

Q.4. Discuss the software requirements gathering activities you have done in lab project and draw a decision tree of the SRS document of the said software. (7)

Q.5 Given basic COCOMO coefficients in the following table:

Project modes	a	b	c	d
Organic	2.4	1.05	2.5	0.38
Semi-detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

A project size of 200 KLOC is to be developed. Software development team has average experience on similar projects. The project schedule is not very tight. Calculate the effort, development time, average staff size and productivity of the project. (7)

Q.6. (a) Derive the expression for system reliability and hazard function for the exponential distribution with $\theta = 1/\lambda > 0$ is an MTTF's parameter, where $\lambda > 0$ is a constant failure rate.

(b) A manufacturer performs an operational life test on ceramic capacitors and finds they exhibit constant failure rate with a value of 3×10^{-8} failure per hour. What is the reliability of a capacitor at 10^4 hours? (3+3)

Q.7. (a) Write a sort note on both black-box and white-box testing of software.
(b) What is the software debugging? Discuss any two types of debugging approach. (3+3)