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Odd Semester Examination-2024: BCA 3rd Year (5th Semester)

Paper Name: Fundamentals of Software Engineering Paper Code: BCA 501
 Time: 2.5 Hours Maximum Marks: 60

Note: Please follow proper numbering while answering the questions

SECTION A

All questions of Section A are compulsory. Each question is of 1 mark

S.No	Questions	CO	BL
1.	Function point analysis (FPA) method decomposes the system into functional units. The total number of functional units are (a) 2 (b) 5 (c) 4 (d) 1	CO 3	L1
2.	A COCOMO model is (a) Common Cost estimation model (b) Constructive cost Estimation model (c) Complete cost estimation model (d) Comprehensive Cost estimation model	CO 4	L1
3.	Which one is not a risk management activity? (a) Risk assessment (b) Risk control (c) Risk generation (d) None of the above	CO 4	L1
4.	The extent to which different modules are dependent upon each other is called (a) Coupling (b) Cohesion (c) Modularity (d) Stability	CO 3	L1
5.	Software reliability is (a) the probability of failure free operation for a specified time in a specified environment (b) the probability of failure of a program for a specified time in a specified environment (c) the probability of success of a program for a specified time in any environment (d) None of the above	CO 4	L1
6.	Which one is not a category of software metrics? (a) Product metrics (b) Process metrics (c) Project metrics (d) People metrics	CO 2	L1
7.	CMM stands for (a) Capacity maturity model (b) Capability maturity model (c) Cost management model (d) Comprehensive maintenance model	CO 4	L1
8.	Software testing is: (a) the process of demonstrating that errors are not present (b) the process of establishing confidence that a	CO 5	L1

	program does what it is supposed to do (c) the process of executing a program to show it is working as per specifications (d) the process of executing a program with the intent of finding errors		
9.	Which one is not a category of maintenance? (a) Corrective maintenance (b) Effective maintenance (c) Adaptive maintenance (d) Perfective maintenance	CO 5	L1
10.	If requirements are easily understandable and defined, which model is best suited? (a) Waterfall model (b) Prototyping model (c) Spiral model (d) None of the above	CO 1	L1
11.	If requirements are frequently changing, which model is to be selected? (a) Waterfall model (b) Prototyping model (c) RAD model (d) Iterative enhancement model	CO 1	L1
12.	If user participation is available, which model is to be chosen? (a) Waterfall model (b) Iterative enhancement model (c) Spiral model (d) RAD model	CO 1	L1
13.	If limited user participation is available, which model is to be selected? (a) Waterfall model (b) Iterative enhancement model (c) Spiral model (d) any of the above	CO 1	L1
14.	If project is the enhancement of existing system, which model is best suited? (a) Waterfall model (b) Prototyping model (c) Iterative enhancement model (d) Spiral model	CO 1	L1
15.	Requirements elicitation means (a) Gathering of requirements (b) Capturing of requirements (c) Understanding of requirements (d) All of the above	CO 2	L1
16.	Which is not a characteristic of a good SRS? (a) Correct (b) Complete (c) Consistent (d) Brief	CO 2	L1
17.	Outcome of requirements specification phase is (a) Design Document (b) Software requirements specification (c) Test Document (d) None of the above	CO 2	L1
18.	Which one is a quality attribute? (a) Reliability (b) Availability (c) Security (d) All of the above	CO 4	L1
19.	The most desirable form of coupling is (a) Control Coupling (b) Data Coupling (c) Common Coupling (d) Content Coupling	CO 3	L1

20.	The most desirable form of cohesion is (a) Logical cohesion (b)Procedural cohesion (c) Functional cohesion(d)Temporal cohesion	CO 3	L1
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SECTION B

Answer any 4 questions.Each question is of 5 marks

S.No	Questions	CO	BL
1.	What are software life cycle models? Discuss main stages of SDLC phases in detail and with diagram.	CO1	L2
2.	An application has the following: 10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external inquiries, and a value of complexity adjustment factor of 1.10. What are the unadjusted and adjusted function point counts? (Refer Table 1)	CO3	L5
3.	Define: a. Verification b. Validation	CO5	L2
4.	Explain Testing and its various categories and sub categories.	CO5	L2
5.	What is Software Maintenance? Also explain its different types.	CO5	L2
6.	A project size of 200 KLOC is to be developed. Determine the mode of the project and calculate the effort, development time, average staff size and productivity of the project. (Refer Table 2)	CO3	L5

SECTION C

Answer any 2 questions. Each question is of 10 marks

S.No	Questions	CO	BL
1.	Explain Capability Maturity Model with diagram. Differentiate between ISO 9000 & CMM.	CO4	L4
2.	Explain Software Quality and its attributes. Draw diagram of McCall Software Quality Model.	CO4	L3
3.	A new project with estimated 400 KLOC embedded system has to be developed. Project manager has a choice of hiring from two pools of developers: Very highly capable with very little experience in the programming language being used or Developers of low quality but a lot of experience with the programming language. What is the impact of hiring all developers from one or the other pool? (Refer the table at the end for coefficients) (Refer Tables 3 & 4)	CO3	L5
4.	Explain Cohesion and Coupling, write briefly about different types of both.	CO3	L2

Functional Units	Weighting factors		
	Low	Average	High
External Inputs (EI)	3	4	6
External Output (EO)	4	5	7
External Inquiries (EQ)	3	4	6
External logical files (ILF)	7	10	15
External Interface files (EIF)	5	7	10

Table 1: Weighting Factors of FPA

Software Project	a _b	b _b	c _b	d _b	Project	a _i	b _i	c _i	d _i
Organic	2.4	1.05	2.5	0.38	Organic	3.2	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35	Semidetached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32	Embedded	2.8	1.20	2.5	0.32

Table 2: Coefficients for basic COCOMO Table 3: Coefficients for intermediate COCOMO

Cost Drivers	RATINGS					
	Very low	Low	Nominal	High	Very high	Extra high
Personnel Attributes						
ACAP	1.46	1.19	1.00	0.86	0.71	--
AEXP	1.29	1.13	1.00	0.91	0.82	--
PCAP	1.42	1.17	1.00	0.86	0.70	--
VEXP	1.21	1.10	1.00	0.90	--	--
LEXP	1.14	1.07	1.00	0.95	--	--
Project Attributes						
MODP	1.24	1.10	1.00	0.91	0.82	--
TOOL	1.24	1.10	1.00	0.91	0.83	--
SCED	1.23	1.08	1.00	1.04	1.10	--

Cost Drivers	RATINGS					
	Very low	Low	Nominal	High	Very high	Extra high
Product Attributes						
RELY	0.75	0.88	1.00	1.15	1.40	--
DATA	--	0.94	1.00	1.08	1.16	--
CPLX	0.70	0.85	1.00	1.15	1.30	1.65
Computer Attributes						
TIME	--	--	1.00	1.11	1.30	1.66
STOR	--	--	1.00	1.06	1.21	1.56
VIRT	--	0.87	1.00	1.15	1.30	--
TURN	--	0.87	1.00	1.07	1.15	--

Table 4: Weights of different cost drivers