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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

V Semester B. E. Regular Examinations Feb/Mar-2025

Artificial Intelligence and Machine Learning

ARTIFICIAL INTELLIGENCE INTEGRATED SOFTWARE ENGINEERING (ELECTIVE)

Time: 03 Hours *Maximum Marks: 100*

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, 9 and 10.

PART-A

			M	BT	CO
1	1.1	What is a product backlog?	01	1	1
	1.2	Give any two disadvantages of incremental development from the management perspective?	02	1	1
	1.3	Identify the two fundamental approaches to requirements elicitation.	02	1	1
	1.4	If performance is a critical requirement, how should the architecture of a system be designed?	02	1	1
	1.5	Suggest any four readers for system requirements of *SRS*.	02	1	2
	1.6	What are the two kinds of design model used in *UML* design?	01	1	1
	1.7	Categorize the four essential elements of design patterns.	02	1	1
	1.8	The methods where an automated unit test framework is used to write tests for a new piece of functionality before that functionality itself is implemented is called _____.	01	1	1
	1.9	Extracting code reviews and the code linked to these comments is a process which is organized into three parts. Which are they?	02	1	1
	1.10	Write a sample *JSON API* call to get the *IDs* of submitted and reviewed patches.	02	1	1
	1.11	What is the main goal of software fault prediction?	01	1	1
	1.12	What is an Oracle?	02	1	1

PART-B

2	a	With the help of neat diagrams, explain waterfall and incremental model.	08		1
	b	Explain the principles of agile methods. Write a sample Test case description for dose checking in the specific format.	08		2
3	a	Consider the case of an Event Management System for a company having branches in several cities. Identify and explain the functional and non-functional requirements in detail.	08		2
	b	Eliciting and understanding requirements from system stakeholders is a difficult process. Analyze and suggest four reasons. Also explain the requirements elicitation and analysis process.	08		2

OR

4	a	Draw a class diagram for a railway reservation system. Use standard notations to denote attributes, methods, visibility and different types of associations.	08		2
	b	Compare and contrast layered architecture pattern and Repository pattern emphasizing on the situations in which it is used, advantages and disadvantages.	08		2
5	a	Explain the different levels at which Software reuse is possible. What are the costs associated with reuse?	08		2
	b	With the help of a diagram, explain the elements of a Legacy system.	08		1
		OR			
6	a	What are the three stages of development testing? Explain.	08		4
	b	What are the variants of open-source licenses? Suggest some guidelines that companies managing projects that use open source should follow.	08		2
7	a	With the help of a diagram, explain Code analysis flow in training the classifier.	08		4
	b	Researchers have proposed two main methods for performing *MBSE* tasks. Explain.	08		4
		OR			
8	a	Explain the two algorithms that are used in feature extraction stage.	08	2	4
	b	What are the tasks that *MBSE* typically consists of ? Represent *CPS* as dynamic system using equation.	08	2	2
9	a	Use relevant examples to show how Machine Learning is used for test cases generation?	08	1	5
	b	Illustrate and explain Test Oracle Structure using Expected Output Behaviours, Human Oracles and Formal Model Specification.	08	1	5
		OR			
10	a	Explain the application of Machine Learning in Software Quality Prediction and Test Cost estimation.	08	2	5
	b	Give a detailed account on Test Oracles Based on Unsupervised Learning Techniques.	08	2	5