HS251TA

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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

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

COMMON TO AIML / CSE / ISE / ECE / EEE / EI / ET

PRINCIPLES OF MANAGEMENT AND ECONOMICS

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, and 9 and 10.

PART-A

			M	BT	CO
1	1.1	Which step in *POSDCORB* involves delegating tasks and giving structured instructions?	01	2	2
	1.2	_____ is the primary scientist associated with the foundation of Administrative Theory.	01	1	1
	1.3	Differentiate between macroeconomics and microeconomics.	02	2	4
	1.4	_____ quadrant of the BCG Matrix represents high market share and high market growth.	01	1	3
	1.5	Define inflation.	01	2	5
	1.6	Define formalization.	02	1	2
	1.7	_____ have provided the foundation for our current theories of motivation, leadership, group behaviour and development, and numerous other behavioural approaches.	01	1	1
	1.8	Adam Smith called price mechanism as _____.	01	1	1
	1.9	The market state that satisfy all the essential features of a perfect competitive market except identity of product is known as _____.	01	2	2
	1.10	According to Fayol's 14 principles of management, '*esprit de corps*' refers to _____ and _____.	02	1	3
	1.11	Mention the 4 different measures of *GDP*.	02	3	4
	1.12	Define economic planning.	02	2	4
	1.13	In $AS-AD$ model the AD curve represents the relationship between the _____ in the economy and the _____.	02	2	3
	1.14	_____ is father of Economics.	01	1	1

PART-B

2	a	Illustrate different management function in detail.	08	2	2
	b	Briefly describe Fayol's 14 principles of management in detail.	08	2	1
3	a	Define Planning. Illustrate the different types of plans in detail.	08	2	2
	b	Bring out the differences between Centralization and decentralization.	08	2	2
		OR			

4	a	Bring out the different types of Organizational strategies.	08	2	2
	b	Illustrate different quadrants of BCG Matrix.	08	3	3
5	a	Briefly describe $D.C.$ McClelland Achievement Motivation Theory.	08	2	3
	b	Illustrate Douglas McGregor theory x and theory y in detail.	08	2	3
		OR			
6	a	Illustrate Robert Blake and Jane Mouton developed Leadership Grid theory	08	3	3
	b	Differentiate between Transactional and Transformational Leadership.	08	3	3
7	a	Briefly describe circular flow model of economics with help of diagram.	08	2	
	b	Illustrate different types of elasticity demand in detail.	08	3	
		OR			
8	a	Differentiate between inductive and deductive reasoning.	08	2	
	b	Illustrate the features of Capitalistic Economy.	08	2	
9	a	Taking an example explain Price Elasticity of Demand and Price Elasticity of Supply.	08	3	
	b	Briefly describe why do Oligopolies exist in today's competitive world.	08	3	
		OR			
10	a	Illustrate key components of classical growth theory within the framework of macroeconomic models.	08	2	
	b	Briefly describe $IS-LM$ model along with equations.	08	2	

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RV COLLEGE OF ENGINEERING®

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V Semester B. E. Regular Examinations Feb / March – 2025

Common to CS / CD / CY/AIML

DATABASE MANAGEMENT SYSTEMS

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	The data in a database at a particular moment in time is called _____.	01	1	1
	1.2	Degree of relation is defined as: _____.	01	1	2
	1.3	A relation schema has more than one key, each one of it is called _____.	01	1	1
	1.4	Consider the set of Function Dependency $F = \{A \rightarrow BC, CD \rightarrow EF, C \rightarrow E\}$. Show that $AD \rightarrow F$ and holds in F.	01	2	3
	1.5	Write the difference between a relation and a relation schema.	02	2	2
	1.6	Distinguish between stored and derived attributes. Give an example.	02	2	3
	1.7	Consider a schema $R(A,B,C,D)$ and functional dependencies $A \rightarrow B$ and $C \rightarrow D$. Determine whether the decomposition of R into $R_1(A,B)$ and $R_2(C,D)$ has the dependency preservation property and lossless join property.	02	3	2
	1.8	Given the following relation instance of Relation $R(W,X,Y,Z)$:			

W	X	Y	
1	1	4	2
2	1	5	3
3	1	6	3
4	1	6	4

Which of the following functional dependencies are satisfied by the instance?

a) $WX \rightarrow Y$
b) $Y \rightarrow Z$
c) $XZ \rightarrow W$
d) $Z \rightarrow X$

	1.9	Differentiate between shared and exclusive locks.	02	3	3
	1.10	Does Elastic Search have a schema? Give reason.	02	2	3
	1.11	Give an example for serial schedule and non-serial schedule.	02	2	4
	1.12	List out the desirable properties of transactions.	02	2	4

PART-B

2	a	Discuss the characteristics of the database approach.	06	1	1
	b	Explain with example structural constraints of a relationship type.	06	2	2
	c	Differentiate between physical data independence and logical data independence. Give an example.	04	2	3

3	a	Suppose you are given the following requirements for a simple database for the National Hockey League (*NHL*). The *NHL* has many teams, each team has a name, a city, a coach, a captain, and a set of players. Each player belongs to only one team and each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records. A team captain is also a player, a game is played between two team (referred to as host_team and guest_team) and has a date (such as May 11th 1999) and a score (such as 4 to 2). Construct a clean and concise *ER* diagram for the *NHL* database. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.	08	3	2
	b	Explain how relational model constraints may be violated by insert, delete operations and describe the types of actions that may be taken if these operations cause a violation.	08	2	1
		OR			
4	a	Explain *DIVISION* operation of relational algebra with an example.	06	2	3
	b	For the following schema write the queries in relational algebra. $STUDENT(\underline{SNO}, SNAME, DEPT)$ $COURSE(\underline{CNO}, CNAME, DEPT)$ $ENROLL(\underline{CNO}, \underline{SNO}, GRADE)$ $PREREQ(\underline{CNO}, PNO)$ i) Find names of all the students enrolled in course name $(CNAME) = CSE562$ ii) Find names of all the students who took all the courses offered by CSE department. iii) For every course, list the course together with the average grade in that course. iv) List all the students who never got a grade above 3.0 v) Find names of all the courses in which more than 10 students have enrolled.	10	3	5
5	a	Consider the relation scheme $R = (A, B, C, D, E, F, G, H, I, J, K, L)$ with the set of functional dependencies $F = \{\{A, B\} \rightarrow \{C\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}, \{B\} \rightarrow \{K, L\}\}$ and keys $\{ABD\}, \{K\}$. Find the *FD's* which does not satisfy *2NF* test. Decompose R into 2NF relations.	06	3	3
	b	For the following schema write the *SQL* query: $Supplier(sid: int, sname: string, city: string)$ $Parts(pid: int, pname: string, color: string)$ $Catalog(sid: int, pid: int, cost: real)$ i) Find pid for parts supplied by supplier name 'Ramesh'. ii) Find the number of suppliers who supply red part. iii) Find the number of parts supplied by each supplier.	06	3	2
	c	Explain insert, delete anomalies with examples.	04	2	2
		OR			
6	a	With an example for each, explain second and third normal form based on primary keys.	06	2	
	b	Consider the following decompositions for the relation schema R. The Relation $R = (A, B, C, D, E, F, G, H, I, J)$ with the set of functional dependencies $F = \{\{AB\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}\}$. Determine whether the following decomposition D lossless join property, with respect to F. $D = \{R_1, R_2, R_3, R_4, R_5\}; R_1 = \{A, B, C\}, R_2 = \{A, D, E\}, R_3 = \{B, F\}, R_4 = \{F, G, H\}, R_5 = \{D, I, J\}$	06	3	

	c	How SQL implements referential integrity constraint of the relational data model? Explain with an example.	04	1	5
7	a	Explain the transaction states with the state diagram.	04	1	2
	b	Consider the three transactions T_1, T_2 and T_3 and Schedules S_1. Draw the serializability graph for S_1 and state schedule is serializable or not. $T_1: r_1(X); r_1(Z); w_1(X);$ $T_2: r_2(Z); r_2(Y); w_2(Z); w_2(Y);$ $T_3: r_3(X); r_3(Y); w_3(Y);$ $S_1: r_1(X); r_2(Z); r_1(Z); r_3(X); r_3(Y); w_1(X); w_3(Y); r_2(Y); w_2(Z); w_2(Y);$	06	3	3
	c	Explain with an example two phase locking protocol.	06	2	4
		OR			
8	a	Why Concurrency control in needed? Explain with an example.	08	2	3
	b	Define Serializability, Conflict Serializability. With an example explain the algorithm for Testing Conflict Serializability of a Schedule.	08	2	2
9	a	Discuss Tokenizer and index in Elastic Search?	06	2	2
	b	Explain Hadoop Distributed File System ($HDFS$) architecture with a neat sketch.	06	1	3
	c	List out the key features of MangoDB NoSQL database.	04	1	1
		OR			
10	a	Discuss MapReduce programming model.	08	2	3
	b	Explain the following types of data with an example: i) Structured ii) Semi structured iii) Unstructured	08	1	

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

Common to ISE/CSE/CD/CY

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Time: 03 Hours *Maximum Marks: 100*

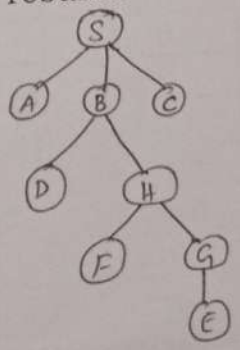
Instructions to candidates:

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 meant by an agent program?	01	1	1
	1.2	A _____ function assigns a numeric cost to each path.	01	1	1
	1.3	Distinguish between a rational agent and a non-rational agent.	02	2	1
	1.4	"Could an agent learn how to search better?" Discuss.	02	2	2
	1.5	An adversial search problems are often known as _____.	01	1	1
	1.6	List any two variants of hill climbing.	01	1	1
	1.7	In a two-player game, how does the minimax algorithm ensure that both players play optimally?	02	2	2
	1.8	List any four key characteristics of Nearest Neighbor classifiers.	02	1	1
	1.9	For a continuous random variable, the probability of taking a specific value of x is _____.	01	1	1
	1.10	Define logistic regression.	01	1	2
	1.11	Illustrate the main technique used to create diversity among the trees in a random forest.	01	2	1
	1.12	In a decision tree, the Gini index of a split is 0.5 and in another split, it is 0.3. Which split is considered better for classification? Give reason.	02	3	1
	1.13	"K" in k-means represent _____.	01	1	2
	1.14	Define cluster analysis.	01	1	1
	1.15	Identify the key challenges in evaluating clustering results.	01	2	1

PART-B

2	a	Describe *AI* problems and its components. Explain how a problem solving agent works? Summarize real-world *AI* problems with examples.	08	2	2
	b	Solve the graph shown in Fig 2b using Breadth-First Search and Depth- First Search algorithms. Explain every step with details. Also compare the results.  Fig 2b	08	3	

3	a	Compare and contrast A^* search with Greedy Best First search. Use suitable examples to illustrate their differences.	10	3	2
	b	Implement Alpha-Beta pruning for the graph shown in Fig 3b.			

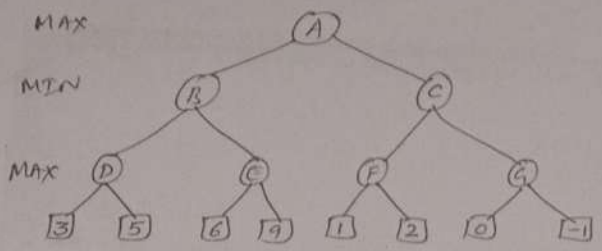
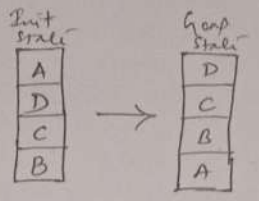


Fig 3b

			06	3	3

OR

4	a	Explain hill climbing algorithm by solving the following problem. Draw the complete search tree with the local and global heuristic values.			



	b	Define Informed Search. Explain A^* search algorithm in detail and apply for the graph shown in Fig 4b where A is the initial node is and J is the goal node.	08	2	3

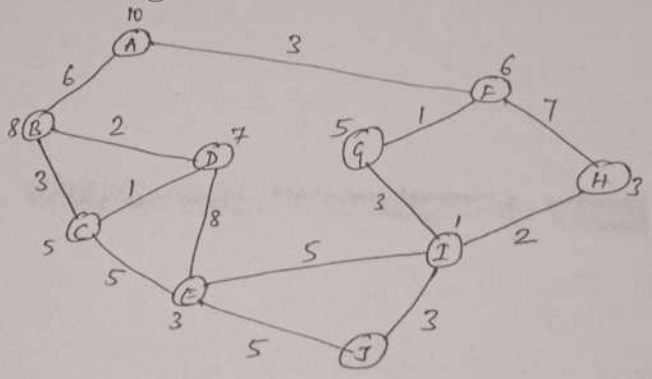


Fig 4b

			08	3	3
5	a	List and explain the common reasons for model overfitting.	06	2	2
	b	Construct a decision tree for the dataset given using ID3 algorithm.			

Outlook	*Temperature*	*Humidity*	*Wind*	*Play tennis*
Sunny	*Hot*	*High*	*Weak*	*No*
Sunny	*Hot*	*High*	*Strong*	*No*
Overcast	*Hot*	*High*	*Weak*	*Yes*
Rainy	*Mild*	*High*	*Weak*	*Yes*
Rainy	*Cool*	*Normal*	*Weak*	*Yes*
Rainy	*Cool*	*Normal*	*Strong*	*No*
Overcast	*Cool*	*Normal*	*Strong*	*Yes*
Sunny	*Mild*	*High*	*Weak*	*No*
Sunny	*Cool*	*Normal*	*Weak*	*Yes*
Rainy	*Mild*	*Normal*	*Weak*	*Yes*

			10	3	3

OR

6	a	Summarize the general framework for classification in Machine Learning.	08	2	1
	b	Explain the following in model selection: i) Incorporating model complexity ii) Estimating statistical bounds	08	2	1
7	a	Describe the following concepts with suitable examples. i) Random forests ii) Boosting iii) Bagging iv) Voting classifiers.	10	2	1
	b	Discuss the K-Nearest Neighbour algorithm with an example.	06	3	3
		OR			
8	a	Describe Naïve-Bayes classifier in detail.	08	2	3
	b	Compare and contrast logistic regression with decision trees and support vector machines in terms of interpretability, training time and performance on linearly separable data.	08	2	
9	a	Briefly describe the following clustering approaches with suitable examples: i) Hierarchical clustering ii) Partitioning clustering iii) Density-based clustering iv) Grid-based clustering.	10	3	
	b	Explain the following: i) Assessing the significance of cluster validity measures ii) Choosing a cluster validity measure.	06	2	
		OR			
10	a	Explain the strength and weakness of k-means clustering. Provide suggestion for improving the algorithm's robustness in real-world applications.	08		
	b	Illustrate the Unsupervised cluster evaluation mechanism using i) Cohesion and Separation ii) The Proximity matrix.	08		

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

Common to CSE/ISE/CD/CY

THEORY OF COMPUTATION

Time: 03 Hours *Maximum Marks: 100*

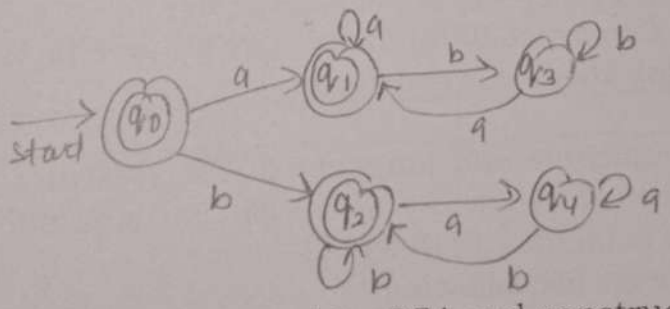
Instructions to candidates:

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	Design a DFA to accept language $L = \{w \mid w \bmod 3 < 2\}$.	02	3	3
	1.2	What are distinguishable and equivalent states?	02	1	1
	1.3	What is the language of the regular expression means $(0^*1 + 1^*0)^*0$?	02	2	1
	1.4	Define parse tree. Construct parse tree for the string $aaabaabba$ for the grammar with productions. $S \rightarrow SS \mid bTT \mid TbT \mid TTb \mid \in$ $T \rightarrow aS \mid SaS \mid Sa \mid a$	02	2	2
	1.5	If L is CFL & R is regular then prove that $L \cap R$ is CFL.	02	1	2
	1.6	Give the transition table for DPDA recognizing the following language $L = \{a^n b^{n+m} a^m \mid n, m \geq 1\}$	02	2	2
	1.7	What is the equivalent left linear grammar for the following given right linear grammar $S \rightarrow abA \mid bB \mid aba, A \rightarrow b \mid aB \mid bA, B \rightarrow aB \mid aA$	02	3	3
	1.8	Differentiate recursively enumerable language and recursive languages.	02	1	1
	1.9	Consider homomorphism h from alphabet {0,1,2} to $\{a, b\}$ defined by $G(0) = ab, h(1) = b$ and $G(2) = aa$. Find $h(0210)$ and $h^{-1}(ababb)$	02	2	2
	1.10	Construct a TM to double a binary integer.	02	4	3

PART-B

2	a	Convert the following DFA to regular expression. 	06	3	2
	b	Define DFA, language accepted by DFA and construct a minimal DFA which accepts set of all strings over {0,1} which when interpreted as a binary number is divisible by 4.	05	4	

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THEORY OF COMPUTATION

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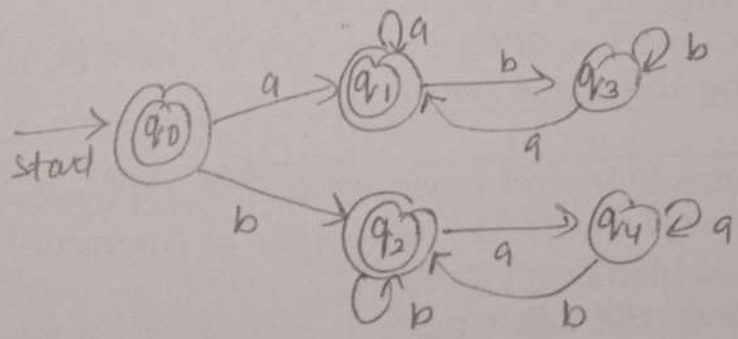
Instructions to candidates:

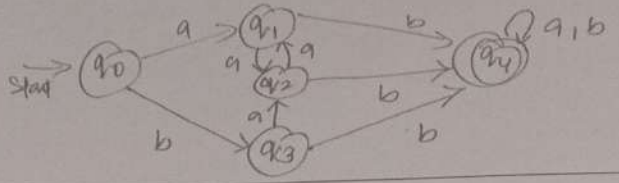
1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, 9 and 10.

PART-A

			M	BT	CO
1	1.1	Design a *DFA* to accept language $L = \{w \mid w \bmod 3 < 2\}$.	02	3	3
	1.2	What are distinguishable and equivalent states?	02	1	1
	1.3	What is the language of the regular expression means $(0^*1 + 1^*0)^*0$?	02	2	1
	1.4	Define parse tree. Construct parse tree for the string *aaabaabba* for the grammar with productions. $S \rightarrow SS \mid bTT \mid TbT \mid TTb \mid \in$ $T \rightarrow aS \mid SaS \mid Sa \mid a$	02	2	2
	1.5	If L is CFL & R is regular then prove that $L \cap R$ is CFL.	02	1	2
	1.6	Give the transition table for DPDA recognizing the following language $L = \{a^n b^{n+m} a^m \mid n, m \geq 1\}$	02	2	2
	1.7	What is the equivalent left linear grammar for the following given right linear grammar $S \rightarrow abA \mid bB \mid aba, A \rightarrow b \mid aB \mid bA, B \rightarrow aB \mid aA$	02	3	3
	1.8	Differentiate recursively enumerable language and recursive languages.	02	1	1
	1.9	Consider homomorphism h from alphabet {0,1,2} to $\{a, b\}$ defined by $G(0) = ab, h(1) = b$ and $G(2) = aa$. Find $h(0210)$ and $h^{-1}(ababb)$	02	2	2
	1.10	Construct a TM to double a binary integer.	02	4	3

PART-B

2	a	Convert the following *DFA* to regular expression. 		06	3
	b	Define *DFA*, language accepted by *DFA* and construct a minimal *DFA* which accepts set of all strings over {0,1} which when interpreted as a binary number is divisible by 4.		05	4

	c	Minimize the states of the following *DFA*.  	05	3	3
3	a	State and prove pumping lemma for regular language: show that the following language is not regular $L = \{0^n \mid n \text{ is prime}\}$.	06	2	2
	b	Define *CFG* and write a *CFG* for the language $L = \{a^i b^j c^k \mid j = i \text{ or } j = k\}$	05	3	4
	c	Convert the below grammar to *CNF* $S \rightarrow ASB \mid \epsilon, A \rightarrow aAS \mid a, B \rightarrow SbS \mid A \mid bb$	05	2	3
		OR			
4	a	Show that the regular languages are closed under union and complement operation.	06	2	2
	b	Define regular grammar and obtain right linear grammar for the language $L = \{a^n b^n \mid n \geq 2, m \geq 3\}$	05	2	3
	c	Define *GNF*. Convert the given grammar $S \rightarrow AB \mid BC, A \rightarrow aB \mid bA \mid a, B \rightarrow bB \mid cC \mid b\ C \rightarrow C$ into *GNF*.	05	2	2
5	a	Let L be $L(M_1)$ for some *PDA* with empty stack $M_1(Q_1, \Sigma, \Gamma, \delta, q_0, z_0, F)$, prove that there exist a final state PDA M_2 such that $L = L(M_2)$. Construct a *PDA* for $L = \{a^n b^n \mid n \geq 1\} \cup \{a^n b^{2n} \mid n \geq 1\}$	06	3	3
	b	State and prove pumping lemma for CFL.	05	2	2
	c	For the grammar $S \rightarrow 0\,S\,1 \mid A, A \rightarrow 1A0 \mid S \mid \epsilon$ obtain the corresponding *PDA*. Show that the string 0101 is accepted by the *PDA* and it is generated by the equivalent *CFG*.	05	2	2
		OR			
6	a	What are the steps to be steps to be followed while finding on equivalent *CFG* from the given *PDA* by empty stack? Obtain a *CFG* that generates the language accepted by *PDA* $M = (\{q_0, q_1\}, \{a, b\}, \{A, Z\}, \delta, q_0, Z, \{q_1\})$ with the transitions $\delta(q_0, a, z) = \{(q_0, AZ)\}$ $\delta(q_0, b, A) = \{(q_0, AA)\}$ $\delta(q_0, a, A) = \{(q_1, \in)\}$	06	2	3
	b	Let $L_1 = \{a^i b^j c^k \mid i < j\}$ & $L_2 = \{a^i b^j c^k \mid i < k\}$ show that L_1 and L_2 are context free but $L_3 = L_1 - L_2$ is not context free.	05	3	3
	c	Define *DPDA*. Construct *DPDA* for $L = \{WCW^R \mid w \in \{a, b\}*\}$. Show by *IDs* the string *abacaba* is accepted.	05	3	3
7	a	Define Turing machine and language of TM. Design a TM such that $(q0, BwB) \vdash* (qf, Bw\,Bw^r\,B)$ where $q0$ is the initial state, qf is final state, B is blank and $W \in \{0,1\}^*$.	08	4	
	b	Write short note on the following: i) Multi-stack machine ii) Counter machine.	08	1	
		OR			

a	Discuss Multi tape Turing Machine and multi track Turing machine in detail.	08	1	1
b	Let x & y are two positive integers represented using unary notation. Design a Turing machine that computes the function $f(x,y)$, where $x,y \in 1^+$. $f(x,y) = x - y \; if \; x > y$ $f(x,y) = y - x \; if \; y > x$ $f(x,y) = 0 \; if \; x = y$	08	4	
a	Define Post correspondence problem (PCP) and solve PCP given below:			

	List A	List B
	xi	yi
1	11	111
2	100	001
3	111	11

	List A	List B
	xi	yi
1	110	110110
2	0011	00
3	0110	110

b	Define Linear Bounded Automata. Design a linear bounded automate to accept the language $L = \{WCW^R \mid W \in (a,b)^*\}$. Give ID for the string $aabcbaa$.	08	3 4

OR

a	If L_1 and L_2 are recursively enumerable language over Σ, then prove that $L_1 \cap L_2$ and $L_1 \cup L_2$ are recursively enumerable.	06	2
b	Write a note on Chomsky hierarchy.	05	1
c	Define context sensitive grammar and write context sensitive grammar for $L = \{a^n b^m c^n d^m, m,n > 0\}$.	05	3

CY255TBD

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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution Affiliated to VTU)

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

Computer Science and Engineering (Cyber Security)

VULNERABILITY ASSESSMENT & PENETRATION TESTING (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	Debate on privacy versus security.	02	2	2
	1.2	What is Vulnerability Assessment?	01	2	2
	1.3	_____ is designed specifically for simulating social engineering attacks.	01	1	1
	1.4	What is meant by *SQL* Injection?	01	1	1
	1.5	Give any two examples of BitTorrent trackers.	01	2	2
	1.6	Differentiate between a black-box, white-box and grey-box penetration test.	02	3	3
	1.7	Why a physical penetration is important?	02	2	2
	1.8	Write the net command used from the command prompt to see what users are members of the local administrators group of an individual machine.	01	2	2
	1.9	Write any two well-known penetration testing methodologies and standards.	02	2	2
	1.10	_____ is the term reserved for machine code that will do the hacker's bidding.	01	2	2
	1.11	_____ command is used to find a list of recommended gadgets for a given module in windows.	01	3	3
	1.12	Distinguish between Static and Dynamic malware analysis.	02	2	4
	1.13	List any four common *SQL* special characters to build *SQL* statements.	01	2	2
	1.14	How to protect yourself from the client-side exploits?	02		

PART-B

2	a	Compare and contrast vulnerability assessment and penetration testing.	06	3	4
	b	Outline the **10** steps involved in the penetration testing process. Describe the significance of each step and how it contributes to identifying and mitigating security vulnerabilities.	10	2	2
3	a	Describe the following physical penetration scenarios in detail: i) The Smokers Door ii) Manned checkpoints iii) Locked Doors iv) The Biometric Door Locks	10	2	2
	b	How to defend against insider attacks? Explain.	06	2	2

		OR				
4	a	Describe Penetration testing with Metasploit's Meterpreter.	10	2	3	
	b	Explain the key steps involved in conducting a physical penetration test.	06	2	3	
5	a	How to write a Penetration Testing Agreement? Also explain the execution of a penetration test.	08	3	3	
	b	List and explain the steps involved in exploit development process in Linux.	08	2	2	
		OR				
6	a	Briefly explain the mechanisms for bypassing Windows Memory Protections.	10	2		
	b	With a neat diagram, explain the Three-phase penetration testing plan.	06	3		
7	a	Describe Cross-site Scripting vulnerabilities in detail.	10	2	2	
	b	Explain three tools used in Automated Binary Analysis for auditing potential vulnerabilities.	06	2	3	
		OR				
8	a	What is meant by Ethical Reverse Engineering? Why bother with Reverse Engineering? Write the Reverse engineering considerations in passive analysis.	08	3		
	b	Explain the following with suitable examples: i) Simple *SQL* Injection ii) Intermediate *SQL* Injection	08	2		
9	a	Describe the various key security concepts of Internet Explorer and their role in mitigating vulnerabilities.	08	2	2	
	b	Explain the latest trends in Honeynet Technology in Malware analysis.	08	1	1	
		OR				
10	a	Identify and describe various Static analysis and Live analysis tools for catching malware.	08	3		
	b	How to find new Browser-based vulnerabilities? Explain various tools to find how Browser-based vulnerabilities and their mitigating roles.	08	2		