RV College of Engineering
Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi
Approved by AICTE New Delhi

Academic Year 2022-2023 (ODD Semester)

USN: 1RV21AI045

Department of Artificial Intelligence and Machine Learning

Course Code: 21AI34
Sem: III Semester
Duration: 90 Minutes

Date:
Maximum Marks: 50

Foundation of Cyber-Physical Systems

Improvement Test

SL. No		Questions	M	BT	CO
1	a)	Discuss Traditional Centralized Sensor Network.	5	2	1
	b)	Illustrate the working of Dynamic Transducer.	5	3	1
2	a)	Consider Smart City as a CPS application and discuss how Cognitive Radios (CR) Sensing Networks are useful in Smart Cities.	5	3	2
	b)	With a neat sketch discuss the working principle of Light Emitting Diode (LED)	5	2	2
3	a)	Explain Smart Sensor Network Architecture.	5	2	2
	b)	Discuss the working principle of Solenoids.	5	2	2
4	a)	Summarize the piezoelectric actuators.	5	3	2
	b)	Illustrate the working principle of Relays with a real-world example.	5	2	1
5	a)	Discuss the Standard IoT protocols Stack.	5	2	1
	b)	Illustrate Typical Underwater Sensor System Architecture.	5	3	1

Improvement Quiz

SL. No	Question	M	BT	CO
1	Define Distributed Sensor Networks.	1	1	1
2	What is the role of Control Environment in Traditional Centralized Sensor Network?	1	3	2
3	List the characteristics of Compressive Wireless Sensing Network.	2	1	2
4	Write the IEEE 802.15.4 Standard Packet Frame Format.	2	1	1
5	Identify the applications of Cognitive Radios (CR) Sensing Networks.	1	3	2
6	What is Ubiquitous Sensor Network?	1	1	1
7	What is the need of IETF 6LoWPAN adaptation layer?	1	1	1
8	How we can fit Internet of Things into CPS.	1	3	1

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USN:_____

Department of Artificial Intelligence and Machine Learning

Course Code: 21AI33
Sem:III

Date: 21-Mar-2023
Duration: 90 Minutes

IMPROVEMENT TEST

Data Structures and Data Analysis (DSDA)

Answer all the Questions

SL. No		Questions	M	BT	CO
1		Write a program that performs the following: a. Creates a singly linked list of integers b. Display the list c. Delete all the nodes which have the key and display the list after deletion, or display the key not found in the list	10	03	01
2	a)	Consider an array of 06 integers used to implement a circular queue. Write the status of the circular queue, along with front and rear pointer values, after the following operations; a. insert 3 b. insert 4,5 c. delete 3 d. insert 6,7,8,9 e. insert 10	04	02	01
	b)	By using a stack of type characters, write a C program to check the given string has a matching number of curly brackets; EXAMPLE: {{AAABBBBCCC}} Output: It is Balanced	06	03	01
3	a)	Discuss the concept of FIFO of data by considering any real-world application.	04	03	02
	b)	Discuss the following; 1. Static versus Dynamic Memory allocation 2. Merits of a doubly-linked list over a singly-linked list	06	02	01
4	a)	You are asked to categorize the customers of a Bank to increase the credit limit. Propose a sound approach to do the above. Assume some relevant attributes for the same.	05	03	02
	b)	Write a cognitive map of at least **ten** attributes to recommend a video to a viewer on any video-sharing platform.	05	03	02
5	a)	Write a brief note on various dimensions of data quality.	05	02	02
	b)	Define and give examples for the following types of attributes a. Nominal b. Ordinal c Numeric	05	02	03

Course Outcome	
CO1	Apply the knowledge of data structures in providing solutions to some software development requirements.
CO2	Perform data analysis of some real-world scientific/business use cases and present the analysis results.
CO3	Investigate appropriate data structures and understand requirements in solving some problems of industry and society.
CO4	Use data analysis tools to illustrate the principles of data interpretation, statistical analysis, and graphical visualizations of the datasets.
CO5	Appraise data structures and analysis knowledge to build a successful career as an AIML engineer, work in teams, and communicate their ideas effectively.

USN:_____

Department of Artificial Intelligence and Machine Learning

M-Marks, BT-Blooms Taxonomy Levels, CO-Course Outcomes

	Particulars	CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4	L5
Marks Distribution	**Max Marks**	26	24	--	--	--	--	20	30	--	--

Course Code: 21AI33
Sem: III

Date: 21-Mar-2023
Duration: 20 Minutes

IMPROVEMENT QUIZ

Data Structures and Data Analysis (DSDA)

Answer all the Questions.

SL. No	Questions	M	BT	CO
1	Why are stacks used in implementing recursion?	02	02	01
2	Give a real-world application of a doubly-linked list.	02	01	03
3	Write a cognitive map for the shopping domain.	02	02	01
4	Define the Explanation finding.	02	02	01
5	Give example for association analysis.	02	02	02

	Particulars	CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4	L5
Marks Distribution	**Max Marks**	06	02	02	--	--	02	08	--	--	--

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1BV21AI045

Academic year 2022-2023 (Odd Sem)

DEPARTMENT OF

BIO TECHNOLOGY

Date	20th March 2023	Maximum Marks	10+25
Course Code	21BT32A	Duration	20 Min (Q) + 60Min (T)
Sem	3rd Sem	CIE II & Quiz II	
ENVIRONMENTAL TECHNOLOGY			

Instructions: Part A should be answered in first two pages of answer scripts.
All questions are compulsory.

PART A

Q. No	Question	Marks	CO	BTL
1	On standard silica scale, the turbidity in drinking water should be limited to	1	3	1
2	The process of lagooning is primarily a means of	1	3	1
3	Human being can hear range of sound frequency between	1	2	1
4	The term Environmental Risk Vigilance is associated to which state of India?	1	4	2
5	In general the per capita water amount available worldwide is ----------	1	3	2

PART B

Q. No	Question	Marks	CO	BTL
1	What are the minor and major sources of biomedical wastes and mention the mitigation measures for the same?	5	3	2
2	Waste disposal is a menace in developing and under developed countries. How does it can be made pleasantry?	5	3	2
3	Elucidate on the E waste and its management.	5	4	2
4	How does environmental design help in sustainable development goals?	5	4	2
5	Explicate on the LEED concept in India.	5	2	2

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max Marks	-	6	13	11	5	20	10	-	-	-

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Academic year 2022-2023 (Odd Semester)

DEPARTMENT OF

CSE/ISE/AIML

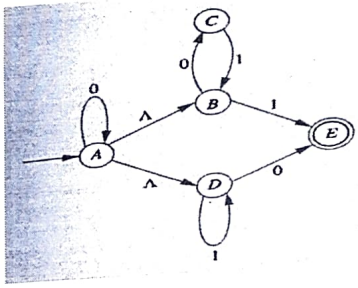
Date	23rd March 2023	Maximum Marks	60
Course Code	21CS36	Duration	110 Mins
Sem	III	CIE - III	
DISCRETE MATHEMATICLA STRUCTURES			

Part - A				
Sl. No.	**Questions**	**M**	**BT**	**CO**
1	Let A={1,2,3,4,5,6,7}, How many symmetric relations are there on A? How many antisymmetric relations are there on A?	2	L2	CO1
2	Let A={1,2,3,4} and R be the relation on A defined as R={(1,1), (1,2), (2,3), (3,3), (3,4)}. Draw the directed graph for R^4.	1	L3	CO2
3	Let A={1,2,3,4} and R be the relation on A defined as R={(1,2), (1,4), (3,3), (4,1)}. Find the smallest relation containing R that is symmetric and transitive.	1	L1	CO1
4	Find the upper bounds of {3,5} and lower bounds of {15, 45} in the POSET ({3, 5, 9, 15, 24, 45}, |).	2	L2	CO1
5	Let A and B are sets with |A|=m and |B|=n where m≥n. If kϵZ^+ with 1≤k≤n. How many functions f:A→B are there such that |f(A)|=k?	1	L3	CO2
6	Let A={1,2,3,4,5} and B={6,7,8,9,10,11,12}. How many functions f:A→B are there such that $f^{-1}(\{6,7,8\})=\{1,2\}$?	1	L3	CO2
7	Let f: R→R defined by $f(x)=\begin{cases} x+7 & x\leq 0 \\ -2x+5 & 0<x<3 \\ x-1 & 3\leq x \end{cases}$ What is $f^{-1}(6)$?	1	L2	CO2
8	Let f and g are functions R→R, where $g(x)=1-x+x^2$ and f(x)=ax+b. If $(gof)(x)=9x^2-9x+3$. Find a and b.	1	L2	CO3

P.T.O

Academic year 2022-2023 (Odd Semester)

PART B

QNo.	Questions	M	BT	CO
1. a	Let A={1,2,3,4,5,6}X{1,2,3,4,5,6}. Define R on A by (a, b) R (c, d), if ab=cd. i. Verify that R is an equivalence relation on A. ii. Determine the equivalence classes [(1, 1)], [(2, 2)], [(3, 2)] and [(4, 3)].	07	L2	CO3
1. b	Draw the Hasse diagram for the inclusion on the set P(S) where S={a, b, c, d}.	03	L3	CO1
2. a	If f:A→B, g:B→C and h:C→D, then (hog)of=ho(gof). Prove this.	05	L2	CO2
2. b	Prove that a function f:A→B is invertible if and only if it is one to one and onto.	05	L2	CO2
3.	Show that there exists an equivalent DFA for the given NFA-ε. Draw the equivalent DFA for the NFA-ε whose transition diagram as shown below. Interpret the symbol ^ as ε.  	10	L3	CO4
4.a	If (G, *) is a group, then prove the following. i. (G, *) contains only one identity element. ii. In (G, *) every element has only one inverse. iii. In (G, *), $(a*b)^{-1}=b^{-1}*a^{-1}$ for all a,b ε G.	06	L4	CO3
4. b	Let G be the set of all nonzero real numbers and let a*b=(ab)/2. Show that (G, *) is an Abelian group.	04	L2	CO1
5. a	Let E:W→C be an encoding function with the set of messages W Z_2^m and the set of code words E(W)=C Z_2^n, where m<n and kεZ+. Prove that we can construct a decoding function D: Z_2^n→W that corrects all transmission errors of weight ≤ k if and only if the minimum distance between the code words is at least 2k+1.	04	L3	CO2
5. b	Define the encoding function E: Z_2^3→Z_2^6 by means of the parity check matrix $H=\begin{pmatrix}1&0&1&1&0&0\\1&1&0&0&1&0\\1&0&1&0&0&1\end{pmatrix}$ i. Determine all the code words. ii. Does this code correct all single errors in transmission?	06	L4	CO3

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max	12	18	20	10	1	27	20	12	-	-