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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY-2023

Paper Code: AIDS/ AIML/IOT-201 **Subject: Data Structures**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q.No1 which is compulsory. Select one question from each unit. Scientific calculators are allowed.

Q1. Attempt the following questions: **(2.5x6 = 15)**

a) What is the condition to check overflow and underflow condition in a queue?
b) List the advantages of linked lists over arrays.
c) Evaluate the following postfix expression using stacks: 320, 10, *, 10, 60, 100, *, /
d) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?
e) Discuss the time complexity to find the *nth* node from a linked list.
f) Find the root of each of the following binary trees:
   a. Tree with post order traversal: ACBDF
   b. Tree with preorder traversal: PBCDFEQ

Unit-I

Q2.

a) Convert the given expression into prefix and postfix expression using stack:
(P+Q*R)-(S+T)/U. **(7)**
b) Given an array of 8 elements [2,4,5,6,7,8,3,9]. Write the program to insert element '1' at the beginning of the array. **(8)**

OR

Q3.

a) Write a program to delete an element from Circular Queue. **(5)**
b) Consider the following operation performed on a stack of size 5. **(5)**

```
Push(1);
Pop();
Push(2);
Push(3);
Pop();
Push(4);
Pop();
Pop();
Push(5);
```

After the completion of all operation, find the number of elements present

c) Differentiate between stacks and queues with suitable examples. **(5)**

Unit-II

Q4.

a) Write an algorithm to implement binary search on given data: 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99 for the item 40. Discuss the complexity of binary search. **(7)**

b) Show step by step procedure of quick sort on A= {9,-3,5,2,6,8,-6,1,3}. **(8)**

OR

Q5.

a) Demonstrate the step by step process of insertion sort of the given array:{12, 11,13, 5, 6} **(7)**

b) Define a circular linked list. Write an algorithm to delete a node from the beginning of the circular linked list. **(8)**

Unit-III

Q6.

a) Construct the AVL tree if following elements are inserted in order: 5, 20, 30, 40, 50, 60, 70, 80, 90, 100, 160, 120, 15. **(7)**

b) A binary tree has eight nodes. The post order and in order traversals of the tree are given below. Draw the tree. **(8)**
Post order: UTRWVSQP
In order: URTPQWSV

OR

Q7.

a) Explain the insertion and deletion process of a node in Binary Search Tree with appropriate examples. **(5)**

b) Explain the different traversal methods of a binary tree with appropriate examples. **(5)**

c) The task is to find sum of all elements smaller than and equal to Kth smallest element. Demonstrate the program to solve the above given task. **(5)**

Unit-IV

Q8.

a) What do you mean by hashing? Discuss any two collision resolution techniques. **(7)**

b) Create the adjacency list and adjacency matrix for the following directed graph: **(8)**

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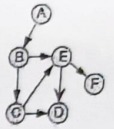
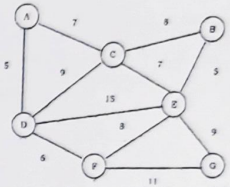


OR

Q9.

a) Create a minimum spanning tree for the following graph using Kruskal's algorithm: **(7)**



b) Differentiate between dense and sparse index with help of an example. **(8)**

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY 2023

Paper Code: AIDS/ AIML/ IOT203 **Subject: Foundations of Data Science**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.No. 1 which is compulsory. Select one question from each unit.

Q1 Attempt **all** question **(3x5=15)**

a) What is data science? What is Seaborn and why is it a popular library for data visualization in Python?

b) What is the purpose of clustering in data science and what are some common algorithms used for clustering?

c) What is data exploration and why is it important in data science? What is the purpose of data normalization in data science?

d) What is data cleaning and why is it necessary in the data science process? What is data visualization and what are its benefits in data science?

e) What is data aggregation and how is it used in data science? What is data modeling and how is it different from data analysis?

UNIT-I

Q2 a) What makes Python a popular language for data science and machine learning? Describe. **(5)**

b) How can you create a synthetic dataset in Microsoft Excel? **(5)**

c) What are the most important traits of a successful data scientist? **(5)**

Q3 a) What are some common techniques for processing unstructured data in data science? **(5)**

b) What are the challenges in processing unstructured data in data science? **(5)**

c) What are the primary responsibilities of a data scientist? What skills does a data scientist need? **(5)**

UNIT-II

Q4 a) How can you load and explore a dataset in Python using Pandas? **(5)**

b) What are some common techniques for handling missing data in a dataset? **(5)**

c) How do you handle exceptions in Python? **(5)**

Q5 a) What is feature scaling and why is it important? How can we visualize the distribution of a numerical feature in a dataset in Python? **(5)**

b) Can you explain the process of data analysis in Python using libraries such as pandas and numpy? **(5)**

c) What are the different data types in Python and how do you declare a variable? **(5)**

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UNIT-III

Q6 a) What are some popular libraries in Python for data science and machine learning and what are they used for? How can you install and manage packages in Python for data science? **(7.5)**

b) How can you perform data cleaning and pre-processing in Python using Pandas and Numpy? **(7.5)**

Q7 a) How can you perform statistical analysis in Python using Scipy and Statsmodels? **(7.5)**

b) What are some common data visualization techniques in Python using Matplotlib and Seaborn? What are salient features of Matplotlib and Seaborn? **(7.5)**

UNIT-IV

Q8 a) What is machine learning and how can you perform supervised and unsupervised learning in Python using scikit-learn? **(7.5)**

b) How can you evaluate the performance of a machine learning model in Python using metrics such as accuracy, precision, recall and F1-score? **(7.5)**

Q9 a) What is trend analysis and how can it be performed in Python using Pandas and Matplotlib? **(5)**

b) What is predictive mining and how can it be performed in Python using scikit-learn and other machine learning libraries? **(5)**

c) What are the different types of recommendation algorithms used in recommender systems? **(5)**

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH.] JANUARY-FEBRUARY 2023

Paper Code: AIDS/AIML/IOT-205 ***Subject: Digital Logic Design***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 (a) Convert the followings:- **(3)**

(i) (225.225)10 to (...)2 (ii) (2AC5.D)16 to (...)10

(iii)(CAFÉ)16 to (...)8

(b) Minimize the following Boolean expressions:- **(3)**

(i) $\overline{AB + A\overline{C} + A\overline{B}C(AB + C)}$

(ii) $\overline{AB + AB\overline{C} + A(B + AB)}$

(iii) $\overline{AB + \overline{C} + (\overline{A + B} + C)}$

(c) Explain the implicants, Prime implicants and Essential Prime implicants with suitable examples. **(3)**

(d) Illustrate the design procedure used to design the combinational circuits. **(3)**

(e) Compare between combinational and Sequential circuits. **(3)**

UNIT-I

Q2 (a) Discuss the common features between the different number systems and also perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. **(7.5)**

(i) 101011 – 111000 (ii) 1110 – 110010 (iii) 11010 - 1101

(b) State and prove Absorption and Consensus Laws in Boolean algebra. **(7.5)**

OR

Q3 (a) Explain the error detection and error correction codes. A 7-bit Hamming code is received as 0101101. Find the correct code? **(7.5)**

(b) Express the function $Y = A + \overline{B}C$ in **(7.5)**

(i) Canonical SOP form (ii) Canonical POS form

UNIT-II

Q4 (a) Solve the logical expression $Y = ABCD + A\overline{B}\overline{C}\overline{D} + A\overline{B}C + AB$ on a 4-variable K-map and obtain the simplified expression from the map. **(7.5)**

(b) Using K- map method, simplify the following Boolean function and obtain (i) minimal SOP and (ii) minimal POS expressions : **(7.5)**

$Y = \Sigma m(0,2,3,6,7) + \Sigma d(8,10,11,15)$

OR

Q5 (a) Realize (a) $Y = A + BC\overline{D}$ using NAND gates. **(7.5)**

(b) $Y = (A + C)(A + \overline{D})(A + B + \overline{C})$ using NOR gates.

(b) Obtain the minimal sum of products expression for the following function and implement the same using universal gates. **(7.5)**

$F(A, B, C, D) = \Sigma(0,2,3,5,7,8,13) + \Sigma d(1,6,12)$

P.T.O.

UNIT-III

Q6 (a) Design the following using logic gates and truth tables:- **(7.5)**
(i) 3 to 8 decoder (ii) Octal to binary encoder.
(b) Discuss the 2-bit magnitude comparator with suitable logical expression and digital circuit. **(7.5)**

OR

Q7 (a) Implement the following Boolean function F(A,B,C,D) = Σ m(2,5,8,9,10,14,15) by using:- **(7.5)**
(i) 8x1 Mux (ii) 4x1 Mux
(b) List the differences among ROM, PROM, EPROM and EEPROM. **(7.5)**

UNIT-IV

Q8 (a) Describe the race-around problem in J-K FF. With the help of suitable logic diagram explain how it is eliminated in Master-Slave J-K FF. **(7.5)**
(b) What is a shift register? Explain the working of a serial in- serial out register with logic diagram and waveforms. **(7.5)**

OR

Q9 (a) Draw the circuit diagram of 4-bit ring counter using D flip flops and explain its operation with the help of waveforms. **(7.5)**
(b) Discuss the following:- **(7.5)**
(i) Programmable Logic Array (PLA)
(ii) Programmable Array Logic (PAL)

****

(ii) Given the battery is bad, fuel tank is empty and gauge not empty, compute the probability that vehicle will not start.

b) Differentiate the terms: Supervised Learning, Unsupervised Learning and Reinforcement learning by citing the real world examples. **(8)**

UNIT-IV

Q8 (a) We come across a number of AI based applications in our day to day lives. Pick up any application of your choice and explain where the following AI concepts are used in the application: **(8)**

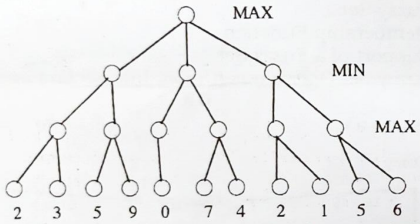
(i) Natural Language Processing
(ii) Knowledge Representation Techniques
(iii) Searching Techniques
(iv) Reasoning Techniques

(b) Briefly describe the current state of art with respect to the usage of AI in Gaming. **(7)**

OR

Q9 (a) Explain the significance of usage of Alpha-Beta Pruning Algorithm. Also write down the Alpha-Beta Pruning Algorithm. **(7)**

(b) For the partial search tree given below for a two player game: **(8)**



(i) Find the best move for the MAX player using the min-max procedure.

(ii) Using alpha-beta pruning shown which parts of the tree need not be searched. Indicate where the cut offs occur.

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY 2023

Paper Code: AIDS/ AIML/ IOT207 ***Subject: Principles of Artificial Intelligence***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data.

Q1 Compulsory to be attempted

a) Briefly describe AI techniques which evolved with the Turing Test. **(3)**

b) Explain how skolemization can be used to remove existential quantifiers? **(3)**

c) Differentiate between monotonic and non-monotonic reasoning. Also explain which one of these is suitable for theorem proving? **(3)**

d) Given blocks' world problem with four identical sized blocks (A, B, C and D) placed on table top as per the given initial state. There is a robotic arm which can move one block at a time to attain the required goal state. Explain how STRIPS operators can be used to perform the following operations for reaching from the given initial state to the desired goal state: **(3)**
STACK(C,D) and PUTDOWN(B)

Initial State: ON(B,A) AND ONTABLE(A) AND ONTABLE (C) AND ONTABLE(D) AND ARMEMPTY

Goal State: ON(C,D) AND ONTABLE(A) AND ONTABLE (B) AND ONTABLE(D)

e) Given a scenario where two players are playing TIC-TAC-TOE game, which AI gaming algorithm can define the moves of both the players. Also write down the steps for the suggested algorithm. **(3)**

UNIT-I

Q2 a) With reference to the Water Jug Problem or N Queen's Problem, explain the following terms: **(8)**
i) State Space
ii) State Space Search
iii) Initial State and Goal State
iv) Production Rules and Control Strategy

P.T.O

b) Explain Best First Search algorithm. Also show the working of algorithm using Open Queue (Priority Queue) and Closed Queue by using suitable tree/graph structure. (7)

OR

Q3 a) Solve the following using crypt-arithmetic algorithm: (7)

```
  CROSS
+ ROADS
---------
 DANGER
```

b) State Monkey Banana Problem. Explain how the goal state of Monkey Banana Problem can be attained by using Means-End Analysis. (4+4)

c) Write the prolog code for Monkey Banana Problem.

UNIT-II

Q4 a) Differentiate between explicit and implicit form of knowledge. (3+4)

b) Explain with the help of suitable examples, following four inference rules used in predicate logic:
Universal Generalization
Universal Instantiation
Existential Introduction
Existential Instantiation

c) For the set of statements given below, prove by resolution that (8)
MARCUS HATED CAESAR.
1) Marcus was a man.
2) Marcus was Poempeian.
3) All Pompeians were Romans
4) Caesar was a ruler.
5) All Pompeians were either loyal to Caesar or hated him.
6) Every one is loyal to someone.
7) People only try to assassinate rulers they are not loyal to.
8) Marcus tried to assassinate Caesar.

OR

Q5 a) There are two medical practitioners. (3+3+1)
Medical practitioner 1 first confirms the symptoms, declares the diseases and then prescribes the medicines.
Medical practitioner 2 reviews medical history, guesses disease, tries to identify the relevant symptoms and in case disease and symptoms are aligned then prescribes the medicine.
i) Based on the given information, identify which of the reasoning (whether forward or backward) is being used by both the medical practitioners.
ii) Compare forward reasoning and backward reasoning.
iii) Also specify whether prolog uses forward reasoning or backward reasoning.

P.T.O.

b) Explain the following four inference rules for prepositional logic with the help of suitable examples: (4+4)
i. Modus Ponens
ii. Modus Tollens
iii. Hypothetical Syllogism
iv. Disjunctive Syllogism

c) Define the terms tautology and contradiction. Also provide the suitable examples.

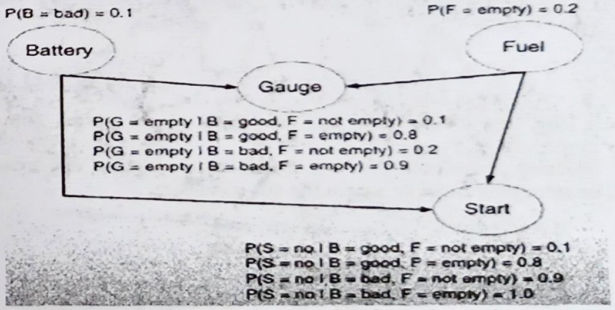
UNIT-III

Q6 a) Consider the mutually exclusive hypothesis represented by a set U={viral, measles, mumps, cough, conjunctivitis} in diagnostic system. (7)
Suppose, we have measure of belief function 'm1' and 'm2' based on the evidence of fever and headache respectively.
m1({viral, measles, mumps}) = 0.85
m2({viral, conjunctivitis}) = 0.6
Combine the given belief functions to generate m3 function using Dempster's Shafer Theory.

b) Explain how fuzzy logic differs from boolean logic? Also explain the following with respect to fuzzy logic by taking a suitable example: (8)
i. Fuzzy Set
ii. Membership Function
iii. Support of a Fuzzy Set
iv. Fuzzy Set Operations (Union, Intersection and Compliment)

OR

Q7 (7)



a) For the Bayesian Network of vehicle/car given above, compute the probabilities as asked.
In the given Bayesian Network, B represents battery status as good or bad, F represents status of Fuel Tank as empty or not empty, G represents status of Gauge as empty or not empty and S represents status of car as start or not start,
(i) Given the battery is good, fuel tank is empty and gauge is empty, compute the probability that the vehicle will start.

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY 2023

Paper Code: AIDS209, AIML209, IOT209 **Subject: Probability, Statistics & Linear Algebra**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data.

Q1 a) The probabilities that students A, B, C and D solve a problem are 1/3, 2/5, 1/5 and 1/4, respectively. If all of them try to solve the problem, what is the probability that the problem will be solved? **(2.5)**

b) Write a short note on skewness of a distribution. **(2.5)**

c) Determine the binomial distribution for which mean is 4 and variance is 3. **(2.5)**

d) Explain the types of random variables. **(2.5)**

e) If A is a Hermitian matrix, then show that iA is a skew-Hermitian matrix. **(2.5)**

f) Define Type I and Type II errors. **(2.5)**

UNIT-I

Q2 a) An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probability of an accident involving a scooter driver, car driver and truck driver is 0.01, 0.03 and 0.15 respectively. One of the insured person meets with an accident. What is the probability that he is a truck driver? **(7.5+7.5)**

b) A random variable X takes the values -1, 1, 3 with equal probabilities and 5 with probability 1/2. Then find probability distribution of X and P(|X-3|>1)

Q3 a) A random variable X has mean 12 and variance 9. Using Chebyshev's theorem, estimate (i) $P(6 < X < 18)$ and (ii) $P(3 < X < 21)$ **(7.5+7.5)**

b) A continuous random variable X has probability density function $f(x) = \begin{cases} \frac{k}{1+x^2}, & -\infty < x < \infty \\ 0, & otherwise \end{cases}$

Determine the value of k and evaluate $P(X \geq 0)$.

P.T.O.

UNIT-II

Q4 a) If a random variable X has the M.G.F $M_X(t) = \frac{3}{3-t}$, obtain the standard deviation of X. **(7.5+7.5)**

b) Out of 800 families with 5 children each, how many would you expect to have (a) 3 boys (b) 5 girls (c) either 2 or 3 boys? Assume equal probabilities for boys and girls.

Q5 a) Find the mean and standard deviation of a normal distribution in which 7% of the items are under 35 and 89% are under 63. **(7.5+7.5)**

Given that $P(Z \leq -1.48) = 0.07$ and $P(Z \leq 1.23) = 0.89$

b) Compute the Spearman's rank correlation coefficient for the following data set.

Cost	80	78	75	75	68	67	60	59
Sale Price	12	13	14	14	14	16	15	17

UNIT-III

Q6 a) Fit a least squares quadratic fit to the following data set. Also, estimate Y(2.4) **(7.5+7.5)**

X	1	2	3	4
Y	1.7	1.8	2.3	3.2

b) Random samples of 400 male workers and 600 female workers were asked about their opinion of a project proposal on quality improvement. 200 male workers and 325 female workers were in favor of the proposal. Test the hypothesis that the proportions of men and women in favor of the proposal are the same at a $\alpha = 5\%$ level of significance. (Use $z_\alpha = z_{0.025} = 1.96$)

Q7 a) Fit an exponential curve of the form $Y = Ae^{BX}$ for the following data. **(7.5+7.5)**

X	1	2	3	4
Y	7	11	17	27

b) A study of TV viewers was conducted to find the opinion about the mega serial 'Ramayana'. If 56% of a sample of 300 viewers from south and 48% of 200 viewers from north preferred the serial, test the claim at $\alpha = 5\%$ level of significance that 'Ramayana' is preferred in the south. (Use $z_\alpha = z_{0.05} = 1.645$)

P.T.O.

UNIT-IV

Q8 a) Use the Gram–Schmidt process to produce an orthogonal basis for the set of vectors {(3, 0, -1), (8, 5, -6)} **(7.5+7.5**

b) Solve the system of equations $\begin{aligned} 3x + y + 2z &= 3 \\ 2x - 3y - z &= -3 \\ x + 2y + z &= 4 \end{aligned}$ using Cramer's rule.

Q9 a) Find a singular value decomposition of $A = \begin{bmatrix} 1 & -1 \\ -2 & 2 \\ 2 & -2 \end{bmatrix}$ **(10+5)**

b) Find an LU factorization of the matrix $A = \begin{bmatrix} 2 & -4 & 2 \\ 1 & 5 & -4 \\ -6 & -2 & 4 \end{bmatrix}$

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY 2023

Paper Code: AIDS/ AIML/ IOT211 **Subject: Universal Human Values-II**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data.

Q1 Attempt all questions: **[2.5x6=15]**

a) What exactly is implied by the term-'nature'? Explain.
b) Suggest any two programs that you can undertake to improve the health of your body?
c) What do the abbreviations given as SVDD and SSDD signify?
d) Explain the feelings of 'care' and 'guidance'.
e) What are the consequences of confusing between Sukh and Suvidha?.
j) What are basic guidelines for value education?

UNIT-I

Q2 a) Explain the process of self-Exploration with the help of Diagram. **[6]**
b) What do you understand by the terms Svatva, Swatantrata and Swarajya? **[6]**
c) What is difference between 'belief' and 'understanding'? **[3]**

Q3 a) 'To be in a state of harmony is happiness' Examine this statement and illustrate with two examples from your day-to-day life. **[8]**
b) Physical facilities are necessary and complete for animals, while they are necessary but not complete for humans' comment **[4]**
c) What are pre-conditionings? **[3]**

UNIT-II

Q4 a) 'Human being is more than just the Body' Explain. **[7]**
b) What is the qualitative difference between the activities of the self and those of the body? Illustrate with one example. **[8]**

Q5 a) What is our present attitude towards the body? What are its consequences? **[6]**
b) How does the feeling of Sanyama facilitate the correct appraisal of our physical needs? **[5]**
c) What are the programs to take care of the body? Explain. **[4]**

UNIT-III

Q6 a) Define 'love'. How can you say that love is the complete value? **[5]**
b) How is trust the foundation value of relationships? **[5]**
c) Differentiate between intention and competence. How do we come to confuse between the two? **[5]**

P.T.O.

AIDS/AIML/IOT-211
P1/2

Q7 a) Explain "Harmony from family order to world family order". [7]
b) What is the meaning of education and Sanskara? How does Sanskara follow education? [8]

UNIT-IV

Q8 a) What are the four orders in nature? Briefly explain them. [7]
b) Write short note on recyclability and self-regulation in nature. [8]

Q9 a) What is Ethical human conduct? Explain it in terms of values, policies and character. [8]
b) How does right understanding provide the basis for humanistic constitution? Suggest some aspects of such a constitution to promote holistic living. [7]

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(b) List five important areas on which an effective problem solver focusses on **[5]**

(c) How does lateral thinking techniques facilitate the generation of ideas? How do they overcome / by-pass the existing mind-patterns? Explain using an example. **[5]**

OR

Q7. (a) Write at least four essential rules to be followed during a "brainstorming session" for generation of ideas. **[5]**

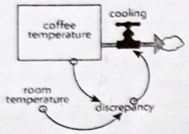
(b) Which one of the following can be used as "Sources of Data" during a problem-solving process? Select the option(s) which are correct. There can be multiple correct options. **[5]**

(i) Observations
(ii) Fish-bone analysis
(iii) Interviews
(iv) Published Materials

(c) Apply 5 Why technique to find out the root cause of why you ate popcorns while watching a movie last night. **[5]**

UNIT-IV

Q8. (a) (i) Explain the working of a feedback loop in a system. Draw the appropriate diagram(s). Explain the nature of the following feedback loop. **[7]**



(ii) What kind of loop the following system demonstrates

When we were kids, the more my brother pushed me, the more I pushed him back, so the more he pushed me back, so the more I pushed him back.

(b) What are systems? What are the characteristics of the systems? Explain briefly the following systems. **[8]**

(i) Solar Systems
(ii) Transport Systems
(iii) Social Systems

OR

Q9. (a) Write a short note on cognition and perception in Indian knowledge systems. **[7]**

(b) Is systems thinking different from design thinking. Explain with the help of an example. **[8]**

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AIDS/AIML/IOT-213

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END TERM EXAMINATION

THIRD SEMESTER [B.TECH] FEBRUARY 2023

Paper Code: AIDS/AIML/IOT-213	***Subject:-: Critical Reasoning and Systems Thinking***
Time: 3 Hours	***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1. Answer the following questions:- **(Any Six)**

(a) List at least four different types of obstacles to Critical Thinking. Describe each obstacle in at least two lines. **[2.5]**

(b) Explain what is an argument with the help of an example. **[2.5]**

(c) Write an example of a well-defined problem statement. Why do you believe that the example given is a well-defined problem statement? **[2.5]**

(d) List any two different techniques for idea generation using Lateral Thinking. Explain each of them in 3-5 sentences. **[2.5]**

(e) Explain the concept of Abilene Paradox. **[2.5]**

(f) "For a surprisingly large number of clinical trials, scientists cannot reproduce the original result when a study is repeated. This suggests that something may be seriously wrong with the system of peer review and publication around clinical trials."Identify the conclusion in the above argument. **[2.5]**

(g) A _____ is a closed chain of causal connections from a stock, through a set of decisions or rules or physical laws or actions that are dependent on the level of the stock, and back again through a flow to change the stock. Fill in the blank and explain your answer.

(i) Interconnections
(ii) Feedback loop
(iii) Flows
(iv) Mental model **[2.5]**

(h) "If a child gets a new toy, he or she will want to play with it; So, if a nation gets new weapons, it will want to use them." The above is an example of which fallacy?

(i) Faulty analogy
(ii) Slippery Slope
(iii) Hasty Generalization
(iv) Straw man **[2.5]**

UNIT-I

Q2. (a) Analyze critically the following passage and answer the following questions: **(7)**

There is a Thai saying, "False happiness makes people become haughty and arrogant. Real happiness makes people joyful and fills them with wisdom and compassion." Is one happy just because one is wealthy? All too many people have allowed money to ruin their lives. We have to understand the importance of absolute happiness over relative happiness. Absolute happiness is not how one stands compared with others, nor is it a transitory, illusory happiness (relative happiness) that fades with the passing of time. Infact it is a state where we strive to attain a state of life where, no matter what circumstances we may encounter, we can feel that life itself is a joy. When we attain that state of life, our lives overflow with unsurpassed joy, wisdom, and compassion—just as the Thai proverb says: "Real happiness makes people joyful and fills them with wisdom and compassion." All kinds of things happen in life. There is sadness, there is happiness. Every day, there are things we may find unpleasant or annoying. Good friends may sometimes quarrel. A family may have a sick child, or one of the family members may suffer unemployment. We face all kinds of sufferings and problems. How formidable are the challenges of living!

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We have to bring out enough strength from within that enables us to persevere in life to the very end. The strength which we are able to manifest through our own efforts serves as the propulsive force for us to pierce through the clouds of suffering like a rocket and powerfully ascending higher and higher, without limit, to fly serenely through the skies of happiness. And we can develop the ability to change all that is negative in our lives into something positive. We can transform all problems into happiness, sufferings into joy, anxiety into hope, and worry into peace of mind. We will always be able to find a way forward. It is our inherent immense power that gives vitality to and breathes fresh life into all things, including individuals, organizations, societies, and nations.

(i) What is the definition of human happiness?
(ii) Author differentiates between absolute happiness and relative happiness. Do you feel this is the key conclusion or there are other conclusions also?
(iii) What are the reasons provided by the writer to support the above conclusions?
(iv) Are there any biases in this passage? If yes, elaborate.
(v) 'We can transform all problems into happiness'. Do you agree with statement, if yes how can we do this?
(vi) Do you agree with the key conclusions of the writer? Give reasons.
(vii) Give some other suggestions how can one live mostly in a state of happiness.

(b) Which of the following statement(s) are correct with respect to "Critical Thinking." Explain your answer. **(8)**
(i) If you have never properly examined your beliefs, they are not truly yours.
(ii) It applies only to your individual beliefs
(iii) It is not about what you think, but how you think.
(iv) It focuses not on what causes a belief, but on whether it is worth believing.

OR

Q3. (a) What are biases? Classify which of the following sentences showcase Personal Bias, Confirmation Bias, Gender Bias, Anchoring bias, Survivorship Bias, Normalcy Bias, Unconscious Bias, Conscious Bias or none of the above. **(7)**
(i) Sally is in support of gun control. She seeks out news stories and opinion pieces that reaffirm the need for limitations on gun ownership. When she hears stories about shootings in the media, she interprets them in a way that supports her existing beliefs.
(ii) I feel whatever are my circumstances, whatever is my past, the forces that determine my future are nowhere but within my own heart and mind. It is here that the star of my destiny shines.
(iii) I tell Ram that the exclusive pursuit of one's own interests cannot bring true happiness. It is in striving for the sake of others that the great path to genuine happiness is opened.
(iv) My mother told me that from a healed, peaceful heart, humility is born; from humility, a willingness to listen to others is born; from a willingness to listen to others, mutual understanding is born; and from mutual understanding, a peaceful society will be born.
(v) Education is a process of stimulating and awakening people from the very core of their being, enabling them to unlock and develop the power within them to create happiness. My teacher's belief in this is very strong.
(vi) Victory in any endeavor is decided by how effectively we use our time without wasting a moment, and how hard we work even when our efforts go unnoticed.
(vii) While it is important to win, it's even more important to remain undefeated no matter what happens. This is particularly valid for boys.

P.T.O.

(b) What is a deductive argument? What is an inductive argument? Give an example of each. **[8]**

UNIT-II

Q4. (a) In the following argument, what is the implicit premise that will make the argument either valid or strong? **(7)**
"Sunita failed her driving test three times. She's probably not paying attention."

(i) Identify the conclusion in the argument given below:
"You should definitely let me look after your dog while you're on holiday. I love dogs. And dogs love me. I have many of dogs at home and know how to look after them. I have six dogs, and I talk to them all the time. I'm a real dog expert."

(b) Correct the following sentences using Inductive Reasoning, where words we use are important. **(8)**
(i) You never go to library and read!
(ii) Men don't survive severe Heart Attack.
(iii) Ram always end up quarreling.
(iv) Laptops will continue to enhance their features every year.

OR

Q5. (a) Which of the following are valid arguments. Justify your answer. **(7)**
(i) Because banning assault rifles violates a constitutional right, the U.S. government should not ban assault rifles.
(ii) The Wall Street Journal says that people should invest heavily in stocks. Therefore, investing in stocks is a smart move.
(iii) When Judy drives her car, she's always late. Since she's driving her car now, she will be late.
(iv) Any movie with clowns in it cannot be a good movie. Last night's movie had at least a dozen clowns in it. Consequently, it was awful.
(v) Without a military intervention in nation X, terrorists cannot be defeated. They will always be able to find safe haven and support in the X regime. [Premise] Even if terrorists are scattered around the world, support from nation X will increase their chances of surviving and launching new attacks. The war on terrorism must include a massive military strike on nation X.
(vi) No one should buy a beer brewed in Canada. Old Guzzler beer is brewed in Canada. So, no one should buy it.
(vii) I have been alive every day for the last 10,000 days; thus, I will always be alive.

(b) Give an example of each. Use one sentence for each of the following **[8]**
(i) Description
(ii) Clarification
(iii) Summary
(iv) Opinion

UNIT-III

Q6. (a) Which of the following statement(s) are true in respect of the way the mind works? **(5)**
(i) The mind is a pattern-making system.
(ii) The arrangement of information is always less than the best possible arrangement.
(iii) The patterns tend to become established ever more rigidly since they control attention.
(iv) Information that is arranged as part of one pattern can easily be used as part of a completely different pattern.
(v) Left and right part of the brain function differently.

P.T.O