Code: 23AMB01

II B.Tech I Semester Regular Examinations, December - 2024
Universal Human Values-Understanding Harmony and Ethical Human Conduct
(Common to ALL)
(For 2023 Admitted Batch Only)
*****

Time: 3 Hours

Max.Marks:70

PART-A

Answer all questions and all questions carry equal marks   10 x 2 = 20M

1. a) What is the purpose of value education?
   b) Define Natural Acceptance.
   c) Define Human Being is More than Just the Body
   d) Define Justice.
   e) Define Prosperity and Happiness.
   f) What is Harmony in nature?
   g) What is Eco-Friendly Production System?
   h) What is Harmony in family?
   i) What is meant by Ethical Human Conduct?
   j) Define Material Order

PART-B

Answer All questions and all questions carry equal marks   5 x 10 = 50M

2. a) What are the requirements to fulfill the basic human aspirations? Explain with an example.

   (OR)

   b) What is the meaning and purpose of self-exploration? How do you make out that the exploration has been accomplished?

3. a) Explain the key components of the right utilization of the body.

   (OR)

   b) Define affection. How does affection lead to harmony in the family? What is the role of physical facilities in the fulfilment of this feeling?

4. a) Explain the concept of harmony in society. How can individuals and communities work towards a harmonious society?

   (OR)

   b) What do you mean by mutual fulfilment in nature? Cite a few examples.

5. a) Explain the Holistic Perception of Harmony in Existence in detail.

   (OR)

   b) What do you mean by "Innateness"? Describe the innateness in the four orders of nature.

6. a) Discuss examples of holistic technologies and management models in detail.

   (OR)

   b) Outline strategies for transitioning towards a value-based life and profession. How can these Strategies be implemented effectively?

II B.Tech I Semester Regular Examinations, December - 2024

R23

Artificial Intelligence
(Common to CSE(AIML) & CSE(AI))
(For 2023 Admitted Batch Only)
*****

Time: 3 Hours

Max.Marks:70

PART-A

Answer all questions and all questions carry equal marks

$10 \times 2 = 20M$

1.a) List two types of agents in AI
 b) What is a sensor in the context of an intelligent agent?
 c) What is the role of a heuristic function in heuristic search algorithms?
 d) How does problem reduction simplify complex problems in AI?
 e) What is the purpose of knowledge representation in AI?
 f) What is logic programming, and how is it applied in AI?
 g) What is unification in first-order logic?
 h) How does first-order logic differ from propositional logic?
 i) What is the role of the inference engine in an expert system?
 j) What is the primary role of an expert system?

PART-B

Answer All questions and all questions carry equal marks

$5 \times 10 = 50M$

2 a) Explain the importance of the Turing Test and its limitations in evaluating AI

(OR)

 b) Define an intelligent agent and describe the components necessary for it to interact with its environment.

3 a) Compare Breadth-First Search (BFS) and Depth-First Search (DFS) in terms of their performance and applications.

(OR)

 b) What is the main drawback of uninformed search strategies, and how does heuristic search address it?

4 a) Explain how facts, rules, and queries are represented in Prolog.

(OR)

 b) Discuss how inheritance in semantic nets can lead to the "inheritance anomaly" and how it is resolved.

5 a) Explain the role of quantifiers in first-order logic with suitable examples.

(OR)

 b) Compare and contrast propositional inference with first-order inference, focusing on expressiveness and complexity.

6 a) Explain the architecture of an expert system, detailing the roles of its main components.

(OR)

 b) Explain the process of knowledge acquisition in expert systems. Why is it critical to system success?

II B.Tech I Semester Regular Examinations, December – 2024
Advanced Data Structures & Algorithms Analysis
(Common to CSE, CSE(AIML), CSE(DS),CSE(AI), CSE(CS), CSE(IOT), CSE(BS) & IT)
(For 2023 Admitted Batch Only)
*****

Time: 3 Hours

Max.Marks:70

PART-A

Answer all questions and all questions carry equal marks   10 x 2 = 20M

1.a) What is time complexity?
b) What are the characteristics of Algorithm?
c) Mention the Graph Traversals Methods.
d) Give the formulae for Strassen's matrix multiplication.
e) Mention two differences between Greedy method and Dynamic Programming.
f) What are spanning trees? Give example.
g) What is backtracking?
h) Define an Un-Directed Graph.
i) What is NP Completeness problem.?
j) Write the chromatic number of the below graph.
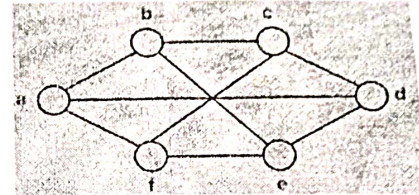
PART-B

Answer All questions and all questions carry equal marks   5 x 10 = 50M

2   a)   Explain in detail about the space and time complexities with an example.

(OR)

b)   Create an AVL tree by using the below set of number step by step: {14, 20, 25, 13, 12, 18, 15) Then, delete 12 and check whether the updated tree is an AVL tree, you need to make it an AVL Tree by completing necessary operations step by step.

3   a)   Write an algorithm to perform Quick Sort for the following elements 14, 17, 9, 11, 2, 98, 6.

(OR)

b)   Explain about Priority Queues and its operations with an example.

4   a)   Explain about the Bellman Ford Algorithm for the below graph
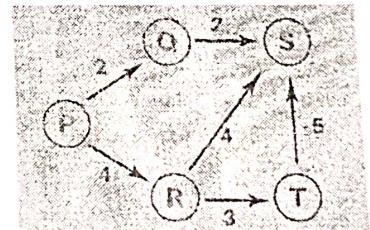
(OR)

b)   Describe in detail about Greedy method and Job sequencing with deadlines.

5   a)   Explain about Sum of Subsets Problems with an algorithm and example.

(OR)

b)   Solve the following instance of 0/1 Knapsack problem using Dynamic Programming n = 3; (W1, W2, W3) = (3, 5, 7); (P1, P2, P3) = (3, 7, 12); M = 4.

6   a)   Explain Cook's Theorem in detail.

(OR)

b)   Distinguish between NP Hard and NP Completeness Problem.

Code: 23ACS06

R23

II B.Tech I Semester Regular Examinations, December - 2024
Object Oriented Programming Through JAVA
(Common to CSE, CSE(AIML), CSE(DS), CSE(AI), CSE(CS), CSE(IOT), CSE(BS) & IT)
(For 2023 Admitted Batch Only)
*****

Time: 3 Hours

Max.Marks:70

PART-A

Answer all questions and all questions carry equal marks   10 x 2 = 20M

1.a) Define Class and Object.
 b) Identify different data types supported in Java and list them.
 c) Explain the purpose of this keyword in Java and demonstrate its usage.
 d) What is a nested class? Mention its types.
 e) What is Inheritance? What are the different types of inheritance?
 f) Differentiate Abstract classes and interface.
 g) Explain the Exception handling mechanism.
 h) List out any four file class methods.
 i) Identify and explain the various states of a thread in Java,
 j) Write a Java program to search a string.

PART-B

Answer All questions and all questions carry equal marks   5 x 10 = 50M

2   a)   State & explain the scope of a variable with an example.

(OR)

 b)   How would you explain Java's arithmetic, logical, and relational operators, and demonstrate their usage through an example program?

3   a)   Create a class in the name of the Student to have Name, RolNo, and Department as attributes and create a method to display the values of the students. Use an object to access the method.

(OR)

 b)   Explain the following terms with an example program:
      i) Method Overloading   ii) Recursive method

4   a)   Explain the "super" keyword and method overriding with an example program.

(OR)

 b)   How would you define an interface in Java, and illustrate its purpose and usage with an example?

5   a)   How would you explain the purpose of the try, catch, and finally statements in exception handling, and demonstrate their usage with an example?

(OR)

 b)   Write a Java program to read the data from a file and write the data to a file.

6   a)   Define Thread and Illustrate how to create threads using Runnable interface with an program.

(OR)

 b)   Write a JavaFX program to implement the event generated by the mouse.

II B.Tech I Semester Regular Examinations, December - 2024
Discrete Mathematics & Graph Theory
(Common to CSE, CSE(AIML), CSE(DS),CSE(AI), CSE(CS), CSE(IOT), CSE(BS) & IT)
(For 2023 Admitted Batch Only)

Time: 3 Hours

Max.Marks:70

PART-A

Answer all questions and all questions carry equal marks   10 x 2 = 20M

1.a) Define Tautology with an example.

b) State the Principle of Inclusion.

c) Find the number of permutations of the letters of the word SUCCESS?

d) Find the generating function of the sequence 1,2,3,4 ....

e) Explain minimal spanning true with an example.

f) Explain converse, contraction and inverse.

g) Explain a chromatic number with an example.

h) Find the solution of $a_{n+2} - a_{n+1} + a_n = 0$

i) Define a subgraph of a graph with an examples.

j) Find the generating function for Fibonacci series.

PART-B

Answer All questions and all questions carry equal marks   5 x 10 = 50M

2 a) Prove the following:
   (i) $[p \wedge (p \rightarrow q)] \Rightarrow q$ (ii)$[p \wedge (p \rightarrow q) \wedge r] \Rightarrow [(p \vee q) \rightarrow r]$
   (OR)

b) Show that $R \wedge (P \vee Q)$ is a valid conclusion from the premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\neg M$.

3 a) Find the disjunctive normal form of $p \wedge (p \rightarrow q)$
   (OR)

b) Determine the number of positive integers n such that $1 \leq n \leq 100$ and n is not divisible by 2, 3 or 5.

4 a) Find the number of nonnegative integer solutions of the equation $x_1 + x_2 + x_3 + x_4 = 18$ under the condition $x_i \leq 7$ for i=1, 2, 3, 4.
   (OR)

b) Let L be a bounded distributive lattice and a in L. If a has a complement in L, then prove that the complement i unique.

5 a) In how many ways can three different coins be placed in two different purses? Also find the number of proper divisors of 441000
   (OR)

b) Find the number of integer solutions of $x_1 + x_2 + x_3 + x_4 + x_5 = 30$ where $x_1 \geq 2$, $x_2 \geq 3$, $x_3 \geq 4$, $x_4 \geq 2$, $x_5 \geq 0$.

6 a) Explain Isomorphism, Non-isomorphism with examples.
   (OR)

b) Explain minimal spanning tree, weighted minimal spanning tree with examples each.