

(Please write your Enrolment No. immediately)

Enrolment No. \_\_\_\_\_

## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April, 2024

Paper Code: AI-302T

Subject: Artificial Intelligence

Time: 1½ Hrs.

Max. Marks: 30\*

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Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

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Q. No.	Question	Max. Marks
1. a.	What is heuristic function? Explain its component?	2
b.	How production system useful for solving AI problems?	2
c.	What is AI? How do you compare human intelligence with artificial intelligence?	2
d.	How is unification used in resolution? Explain with an example?	2
e.	Why is learning considered as important component of intelligence? Give example to support your answer.	2
2. a.	What is an intelligent agent? Explain its different types?	5
b.	What do you mean by Hill climb Search technique? What are the various problems encountered in it?	5
3. a.	Compare forward chaining and backward chaining.	5
b.	Represent following facts as predicate <ul style="list-style-type: none"><li>• Marcus was man.</li><li>• Marcus was a Pompeian.</li><li>• All Pompeians were Romans .</li><li>• Caesar was Ruler.</li><li>• All Romans were either loyal to Caesar or hated him.</li><li>• Everyone is loyal to someone.</li><li>• People only try to assassinate Caesar.</li></ul>	5
4 a.	Explain different type of informed search algorithm. Write the algorithm for the best first search.	5
b.	Differentiate between declarative and procedural knowledge with an example?	5

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## Midterm Examination

6<sup>th</sup> Semester [B.TECH]

April-2024

Time: 1: 30 hrs

Max Marks: 30

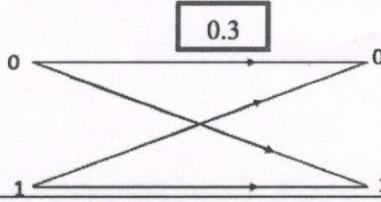
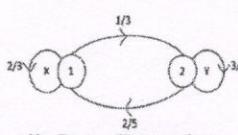
Paper Code: - AI-316T

Subject: -Artificial Intelligence & Machine Learning

Note: Attempt any three questions including Q.No. 1 which is compulsory.

- |               |   |   |     |
|---------------|---|---|-----|
| <b>Q1 (a)</b> | AI is interdisciplinary in nature and its foundations are in various fields." Justify the statement.                          | 2 | CO1 |
| <b>(b)</b>    | What are the problems associated with propositional logic?  | 2 | CO2 |
| <b>(c)</b>    | Explain the characteristics and limitations of uninformed search algorithms.  | 2 | CO1 |
| <b>(d)</b>    | Is heuristic search always better than blind search? Justify your answer.   | 2 | CO1 |
| <b>(e)</b>    | Differentiate between forward and backward chaining.  | 2 | CO2 |
| <b>Q2 (a)</b> | What do you mean by Artificial Intelligence? How you define problem as a state space search? Explain using water jug problem? | 5 | CO1 |
| <b>(b)</b>    | Explain how heuristic function helps in the process of searching? Discuss in detail Best First Search algorithm with example. | 5 | CO1 |
| <b>Q3.(a)</b> | Explain constraint satisfaction problem with the help of an example.  | 5 | CO1 |
| <b>(b)</b>    | How is unification used in resolution? Explain with example.  | 5 | CO2 |
| <b>Q4.(a)</b> | Differentiate between breadth first search and depth first search with the help of example.                                   | 5 | CO1 |
| <b>(b)</b>    | What do you mean by intelligent agents? Explain various types of agents.  | 5 | CO1 |

**MID TERM EXAMINATION****B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)**6<sup>th</sup> Semester, April, 2024**Paper Code: CS-310T****Subject: ITC****Time: 1½ Hrs.****Max. Marks: 30****Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.**

<b>Q. No.</b>	<b>Question</b>	<b>Max. Marks</b>	<b>CO(s)</b>
<b>1 (a)</b>	Define the term: Amount of information. Find out the information conveyed by one of the two equally probable messages.	2	CO1
<b>(b)</b>	What is joint probability. State its properties	2	CO1
<b>(c)</b>	Define different types of channels wrt channel matrix	2	CO2
<b>(d)</b>	Define channel capacity. Also, mention the channel capacity of binary symmetric channel	2	CO2
<b>(e)</b>	For the given binary symmetric channel, write the channel matrix  	2	CO2
<b>2 (a)</b>	State and establish Kraft- McMillian inequality	4	CO2
<b>2 (b)</b>	For the following messages with their probabilities given as $\begin{matrix} X_1 & X_2 & X_3 & X_4 & X_5 & X_6 & X_7 \\ 0.05 & 0.15 & 0.2 & 0.05 & 0.15 & 0.3 & 0.1 \end{matrix}$ Construct the Huffman tree and hence determine the Huffman Code for each of the possible symbols. Also determine the code efficiency.	6	CO3
<b>3 (a)</b>	Define mutual information. Show that $H(X, Y) = H(X/Y) + H(Y)$	4	CO1
<b>3 (b)</b>	For the JPM matrix given below, find $H(X), H(Y), H(X, Y)$ and $H(Y/X)$ $P(Y/X) = \begin{bmatrix} 0.6 & 0.2 & 0.2 \\ 0.2 & 0.6 & 0.2 \\ 0.2 & 0.2 & 0.6 \end{bmatrix}$ Also, the input probabilities of the channel are: $P(X) = [1/3, 1/3, 1/3]$	6	CO1
<b>4 (a)</b>	Derive the expression of channel capacity for channels of infinite bandwidth	4	CO2
<b>4 (b)</b>	For a markov source shown in figure below, find  i. State Probabilities      ii. State Entropies      iii. Source Entropy	6	CO1

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## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April, 2024

Paper Code: CS – 312 T

Subject: Network Security & Cryptography

Time: 1½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	Max. Marks	CO(s)
1	Attempt any two of the following: (5 x 2)  a) Briefly explain Diffie Hellman Key Exchange with example b) Explain in details Hash Functions c) Distinguish between Monoalphabetic and Polyalphabetic Cipher with example.	10	CO1 CO1 CO1
2	a) Perform encryption and decryption using the RSA algorithm for $p=11, q=13, e=1, M=7$  b) Explain Elliptic Curve Cryptography  c) Differentiate between Linear and Differential Cryptanalysis	5 3 2	CO2 CO2 CO2
3	a) Differentiate Triple DES with two and three keys.  b) Find the results of the following operations: 1. $-11 \bmod 7$ 2. $\gcd(1970, 1066)$  c) Explain Caesar Cipher and encrypt the message “HELLO” with a shift of 3	5 2 3	CO2 CO1 CO1
4	a) Explain AES in Detail. Is AES Public Key Cryptography or Private Key Cryptography?  b) Differentiate between Symmetric and Asymmetric key cryptography.  c) Using the Key “monarchy” encrypt plaintext “instruments”. Use Playfair Cipher	5 2 3	CO1 CO1 CO1

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## MID TERM EXAMINATION

B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April, 2024

Paper Code: DA-304T

Subject: Statistics, Statistical Modelling and Data Analytics(SSMD)

Time: 1 1/2 Hrs.

Max.Marks: 30

Note: Attempt Q.No. 1 which is compulsory and any two more questions from remaining.

Q.No.	Question	Max.Marks	CO(s)																		
1	a) Three students A, B, and C are running in a race. A and B have the same probability of winning and each is twice as likely to win as C. Find the probability that B or C wins b) Define Properties of the Normal Distribution and also Define any two hypothesis tests c) Obtain the line of regression of y on x for the data given below: <table border="1"><tr><td>X</td><td>1.53</td><td>1.78</td><td>2.60</td><td>2.95</td><td>3.42</td></tr><tr><td>Y</td><td>33.50</td><td>36.30</td><td>40.00</td><td>45.80</td><td>53.50</td></tr></table>	X	1.53	1.78	2.60	2.95	3.42	Y	33.50	36.30	40.00	45.80	53.50	3M	CO1						
X	1.53	1.78	2.60	2.95	3.42																
Y	33.50	36.30	40.00	45.80	53.50																
	d) Define Data Visualization and Least square method with a real life application	2M	CO1																		
2	a) Find the mean and variance of uniform probability distribution $f(x) = \frac{1}{n}$ for $x=1,2,\dots,n$ b) For discrete probability distribution <table border="1"><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>f</td><td>0</td><td>k</td><td>2k</td><td>2k</td><td>3k</td><td><math>k^2</math></td><td><math>2k^2</math></td><td><math>7k^2+k</math></td></tr></table> Determine: (i) k (ii) Mean, (iii) Variance (iv) smallest value of x such that $P(X \leq x) > \frac{1}{2}$	x	0	1	2	3	4	5	6	7	f	0	k	2k	2k	3k	$k^2$	$2k^2$	$7k^2+k$	3.5M	CO2
x	0	1	2	3	4	5	6	7													
f	0	k	2k	2k	3k	$k^2$	$2k^2$	$7k^2+k$													
3	a) State and prove Gauss Markov theorem b) Let V be a vector space in $\mathbb{R}^3$ . Examine whether the following are the subspaces or not? (i) $W = \{(a,b,c)   a^2 + b^2 + c^2 \leq 1\}$ and (ii) $W = \{(a,b,c)   a = b = c\}$	5M	CO1																		
4	a) Fit a straight line to the following data considering y as the dependent variable: <table border="1"><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>5</td><td>7</td><td>9</td><td>10</td><td>11</td></tr></table> b) In a sample of 1000 people, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice eater and wheat eater are equally popular at 1% level of significance	x	1	2	3	4	5	y	5	7	9	10	11	8M	CO2						
x	1	2	3	4	5																
y	5	7	9	10	11																
		2M	CO1																		

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## MID TERM EVALUATION

SIXTH SEMESTER [B.TECH.] APRIL 2024

Paper Code: EEE 320T

Subject: UEE

Time: 1.5 Hours

Maximum Marks: 30

Note: Attempt THREE questions including Q. no. 1 which is compulsory.

1A) What do you understand by the term "photometry"? (2.5)

B) Explain "Diffused Reflection." (2.5)

C) Why is low voltage and high current supply preferred in arc furnaces and welding? (2.5)

D) What is the difference between welding flux and slag? (2.5)

2A) State and prove the inverse square law of illumination . (5)

B) Describe the operation of a sodium vapour lamp. (5)

3A) Six resistances, each of 100 ohms, are used in a resistance heating furnace. Two elements are connected in parallel in each phase. How much power is drawn when a 400 V three phase star connected supply is applied to the combination? (5)

B) Using a neat diagram, explain the construction and operation of a submerged arc furnace. (5)

4A) Explain the atomic hydrogen arc welding process. (5)

B) Two lamp posts are 6 m apart. Each has been fitted with a lamp of intensity 128 candela. Their vertical height above the ground is 8 m. Calculate the illumination on the ground directly under the lamp at the LEFT end. (5)

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## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

VI Semester, April, 2024

Paper Code: EEE-324T

Subject: Introduction to Data Communication and Networking

Time: 1½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	Max. Marks	CO(s)
1 (a)	Define networking. What are the different components of computer network?	2	CO1
(b)	What are the differences with star and ring topology?	2	CO1
(c)	Differentiate between twisted pair cable and coaxial cable.	2	CO1
(d)	Differentiate between a bridge, hub and a switch.	2	CO2
(e)	What is HDLC?	2	CO2
2 (a)	Draw the OSI network architecture and explain the functionalities of every layer in detail.	5	CO1
(b)	Briefly explain the different types of network topologies. Write each of its advantages and disadvantages.	5	CO1
3 (a)	Explain the Shielded twisted pair (STP) and Unshielded twisted pair (UTP).	5	CO1
(b)	Explain the major component of a packet switch and their functions.	5	CO1
4 (a)	Explain the physical properties of Ethernet 802.3 with necessary diagram of Ethernet transceiver and adaptor.	5	CO2
(b)	Examine the various issues in the Data link layer.	5	CO2

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FIRST-TERM EXAMINATION EIGHT SEMESTER [B.TECH.]

APRIL 2024

PAPER CODE: ETEE-426

SUBJECT: POWER PLANT INSTRUMENTATION

TIME: 1 ½ HRS.

MAX MARKS: 30

NOTE: Attempt Q. no. 1 and any two more questions.

Q. no.	Question Statement	Marks	CO
1 (a)	Explain cooling towers	2	1
1 (b)	Explain the working of the boiler	2	1
1 (c)	Explain the working of the Turbine	2	1
1 (d)	What is the working of the Coal handling plant	2	1
1 (e)	Write a short note on the Power share of electricity feed by thermal power plant.	2	1
2	Explain different types of boilers in detail	10	2
3	Explain in detail about control and optimization of combustion required in boiler instrumentation	10	2
4	Write a detailed comparison of thermal power plants, nuclear power plants and hydroelectric power plants.	10	1

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## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

VI Semester, April, 2024

Paper Code: OCSE-310T

Subject: Data Structures and Algorithms

Time: 1½ Hrs.

Max. Marks: 30

**Note:** Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	Max. Marks	CO(s)
1 (a)	What are linear and non-linear data structure, explain with examples.?	3	CO1 & CO2
(b)	Differentiate between arrays and linked lists.	2	CO1
(c)	Explain Binary search tree.	3	CO2
(d)	Explain the Row Major and Column Major Order method of array representation.	2	CO1
2 (a)	A 2-dimensional array X[4] [4] is stored row-wise in the memory. The 1st element of the array is stored at location 80. Find the memory location of X[3] [1] if each element of array required 4 byte memory.	5	CO1
(b)	Explain Priority Queues and list their applications.	5	CO2
3(a)	Consider the following infix expression and convert into postfix expression using stack. A+B*C-D^(E^F)	4	CO1
(b)	Give the algorithm/program for insertion and deletion of a node in binary search tree.	6	CO2
4(a)	What do you understand by the term Algorithm, explain the importance of space-time tradeoff ?	5	CO1 & CO2
(b)	Explain Preorder, Postorder, and Inorder Tree traversal.	5	CO2

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Mid Term Examination

B. Tech Programmes (Under the Aegis of USICT)

6<sup>th</sup> Semester, April-2024

Paper Code: -OCSE-306T

Subject: -C++ Programming

Time: 1½ Hrs.

Max Marks: 30

Note: Attempt Q.No. 1 which is compulsory and any two more Questions from remaining.

Q.1 (a) What is the data type? Why do we require data type? (2) CO1

(b) Distinguish between the following: (4) CO3

i) overloading and overriding.

ii) member functions and constructors.

(c) What is meant by abstract class? Why is it required? (2) CO1

(d) Give two examples for objects from the hall in which you are writing the examination.

Name the corresponding class or classes. (2) CO1

Q.2 (a) Write a C++ program to swap the numbers by using call by value and call by reference. (5) CO1

(b) Give the concept of array of objects and pointer to objects with an example (5) CO2

Q.3 (a) Explain copy constructor and default constructor with an example. (5) CO3

(b) Explain the striking features of object-oriented programming. (5) CO3

Q.4 (a) Write the various forms of inheritance supported by C++. (5) CO3

(b) What is the difference between static and const functions. (5) CO3

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## MID TERM EXAMINATION

### B.TECH PROGRAMME (UNDER THE AEGIS OF USICT)

VI<sup>th</sup> Semester, April, 2024

Paper Code: CIE-306T

Subject: Advanced Java Programming

Time: 1½ Hrs.

Max. Marks: 30

**Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.**

Q. No.	Questions	Max. Marks	CO(s)
Q1 a)	What is the difference between join() and yield() methods in Java?	2	CO1
b)	What is a socket and what does it consists of?	2	CO1
c)	How do you ensure that a Java class complies with the JavaBeans conventions?	2	CO3
d)	What is the difference between HTTP GET and HTTP POST requests.	2	CO2
e)	Explain the "diamond problem" in the context of multiple inheritance. How does Java's approach to inheritance address this issue?	2	CO1
Q2 a)	Why we use Java Bean? How to access the Java Bean class. Write a simple program to demonstrate the Java Bean class.	5	CO3
b)	How to create TCP Connection Between Client-Server in Java using socket? Write a Java program to demonstrate this connection.	5	CO1
Q3 a)	Explain the life cycle of servlet.	5	CO2
b)	Explain Stateful Session and Stateless Session Bean in Java.	5	CO3
Q4 a)	Define Cookies. How Cookie works? Write a simple Java servlet program to create a cookie.	5	CO2
b)	Differentiate between checked and unchecked exceptions. Write a Java Program to demonstrate the concept of user defined exceptions.	5	CO1

# MID TERM EXAMINATION

SIX SEMESTER [B. TECH.] JAN 2024

Paper Code: CIE-332T

Subject: Programming in Python

Time: 1Hour 30 Min.

Maximum Marks: 30

**Note:** Attempt three questions in all including Q. No. 1 which is compulsory.

- Q1. (a)** What is the difference between logic error and syntax error? [2] CO1  
**(b)** What are the features of Python Programming language? [2] CO1  
**(c)** Write a Python program to replace last value of tuples in a list. [2] CO3

Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]

Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]

- (d)** Create a 5x 2 integer array from a range between 100 to 200 such that the difference between each element is 10. [2] CO2  
**(e)** What is lamda function? Explain with example. [2] CO2

- Q2. (a)** Write a program to calculate GCD of two numbers. [5] CO2  
**(b)** What are the different types of decision control statements? Explain with examples. [5] CO1

- Q3. (a)** Write a Python program to calculate the number of minutes in a week. [5] CO2  
Make variables for DaysPerWeek, HoursPerDay, and MinutesPerHour.

- (b)** What will be the output of the following Python code snippet? [2] CO2  
for i in "join(reversed(list('abcd'))):  
 print (i)

- (c)** What is the difference between List, Tuples and Dictionary? Explain in detail. [3] CO3

- Q4. (a)** Write a program to demonstrate the concept of exception handling in python. [5] CO4

- (b)** Justify the statement: “Strings are immutable”. Explain string manipulation in python programming with the help of code. [5] CO3

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## Midterm Examination

6<sup>th</sup> Semester [B.TECH]

April-2024

Time: 1: 30 hrs

Max Marks: 30

Paper Code: - CIE-356

Subject: -WEB TECHNOLOGY

Note: Attempt any three questions including Q.No. 1 which is compulsory.

- |                |  |   |     |
|----------------|--|---|-----|
| <b>Q.1 (a)</b> | Define Anchor tag and image tag with an example  | 2 | CO1 |
| <b>(b)</b>     | What is JavaScript? Write the advantages of JavaScript                                       | 2 | CO2 |
| <b>(c)</b>     | Define Event. How events are handled in JavaScript.  | 2 | CO1 |
| <b>(d)</b>     | List the types of Style sheets with Example.   | 2 | CO1 |
| <b>(e)</b>     | What is the difference between GET and POST methods in JavaScript                            | 2 | CO2 |
|                |  |   |     |
| <b>Q2 (a)</b>  | Explain the structure of the HTML webpage with an example.                                   | 5 | CO1 |
| <b>(b)</b>     | Define Form tag. Design a Registration page by using all Form controls.                      | 5 | CO1 |
| <b>Q3.(a)</b>  | Explain various operators and data types available in java script with examples.             | 5 | CO2 |
| <b>(b)</b>     | Define List Tag with an example.   | 5 | CO1 |
|                |  |   |     |
| <b>Q4.(a)</b>  | What is the need of scripting languages in web Technologies.                                 | 5 | CO2 |
| <b>(b)</b>     | Build a JavaScript program to convert temperature from Celsius to Fahrenheit and vice versa. | 5 | CO2 |

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## MID TERM EXAMINATION

### B. TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April 2024

**Paper Code: ICE-314T**

**Subject: Advanced Control Systems for Instrumentation**

**Time: 1½ Hrs.**

**Max. Marks: 30**

**Note: Attempt Q.No.1 which is compulsory and any two more questions from remaining.**

Q.No.	Questions	Max. Marks	CO(s)
1(a)	Explain the term state and state variables.	2.5	CO1
1(b)	Find Eigen values for given matrix $A = \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix}$	2.5	CO2
1(c)	Determine the controllability of the following system $A = \begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix}; b = \begin{bmatrix} 1 \\ 0 \end{bmatrix}; c = [1 \ 1]$	2.5	CO2
1(d)	Explain the observability condition of control system.	2.5	CO1
2(a)	Find Eigen values and Eigen Vectors for given matrix $A = \begin{bmatrix} 0 & 1 & 0 \\ 3 & 0 & 2 \\ -12 & -7 & -6 \end{bmatrix}$	5	CO2
2(b)	Construct state model for given differential equation $\frac{d^3y}{dt^3} + \frac{d^2y}{dt^2} + 6\frac{dy}{dt} + 7y = 2u(t)$	5	CO1
3(a)	Derive the transfer function corresponding to the following state model. $\dot{X} = \begin{bmatrix} -1 & 0 \\ 1 & -2 \end{bmatrix}X + \begin{bmatrix} 1 \\ 0 \end{bmatrix}u$ $Y = [1 \ 1]X$	5	CO1
3(b)	Obtain controllable canonical form of given system $\frac{s+3}{s^3 + 9s^2 + 24s + 20}$	5	CO2
4(a)	For the transfer function models and input given below, find response $y(k)$ as a function of $k$ . $G(z) = \frac{Y(z)}{R(z)} = \frac{2z - 3}{(z - 0.5)(z + 0.3)}$ $r(k) = \begin{cases} 1; & k \text{ even} \\ 0; & k \text{ odd} \end{cases}$	5	CO2
4(b)	Determine the pulse transfer function for given system 	5	CO2

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## MID TERM EXAMINATION

### B. TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April 2024

Paper Code: ICE-322

Subject: Neural Networks and Fuzzy logic

Time: 1½ Hrs.

Max. Marks: 30

**Note:** Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Questions	Max. Marks	CO(s)
1(a)	Explain how the biological neural network is differentiated from Artificial Neural Network.	2	CO1
1(b)	What do you understand by feedback network.	2	CO1
1(c)	What are the different characteristics of Neural Network.	2	CO1
1(d)	What is difference between supervised and unsupervised learning.	2	CO2
1(e)	Explain how reinforcement learning is helpful for Neural Network	2	CO1
2(a)	Explain various types of learning methods used to train neural network	5	CO2
2(b)	Describe all activation functions and their related mathematical expressions.	5	CO2
3(a)	Describe Hebb's learning algorithm for the implementation of XOR logic Gate	5	CO2
3(b)	Explain Delta learning algorithm for the implementation of OR gate	5	CO2
4(a)	Explain single layer perceptron model with its algorithm.	5	CO2
4(b)	Explain back propagation algorithm with example.	5	CO2

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## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

VI Semester, April, 2024

Paper Code: ICE-328T

Subject: Introduction to Internet of Things

Time: 1½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	Max. Marks	CO(s)
1.(a)	Define the concept of IoT.	2	CO1
(b)	Differentiate between a sensor and an actuator.	2	CO2
(c)	Explain the meaning of "Things" in IoT.	2	CO1
(d)	Mention two types of actuators used in IoT based control applications.	2	CO2
(e)	What is M2M in context of IoT systems?	2	CO1
2.(a)	What are the Major Components of IoT System? Discuss in detail.	5	CO1
(b)	Explain one application of IoT based system with block diagram and explain its sequence of operation.	5	CO1
3.(a)	Explain the issues related to standardization of IoT.	5	CO2
(b)	Discuss the challenges and threats associated with application of IoT.	5	CO1
4.(a)	Explain the concept and need of Arduino based development platform.	5	CO2
(b)	Discuss the types of sensors along with examples for use in IoT based applications.	5	CO2

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Enrolment No. ....

**MID TERM EXAMINATION**  
**B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)**  
**SIXTH SEMESTER, April, 2024**

Paper code: ECE-306T

Subject: VHDL Programming

Time: 1 1/2 Hrs.

Max. Marks: 30

**Note: Attempt Q. No.1 which is compulsory and any two questions from remaining.**

Q. No.	Question	Max. Marks	CO(s)
1(a)	Explain the difference between 'std_logic' and 'std_logic_vector'.	2	CO1
1(b)	Explain with example the need/significance of resolution function.	2	CO1
1(c)	Discuss different attributes of VHDL with example.	2	CO2
1(d)	Explain the concept of delta delay in VHDL.	2	CO1
1(e)	Explain how generics can be used in VHDL with a simple example involving an AND gate.	2	CO2
2(a)	Describe four different classes of data objects with examples. Define enumeration data type.	5	CO1
2(b)	Write the VHDL code for barrel shifter.	5	CO2
3(a)	Explain effect of inertial delay on signal drivers with the help of example.	5	CO1
3(b)	Design and write the VHDL code for 3-to-8 decoder using behavioral modeling.	5	CO2
4(a)	Explain the differences between concurrent and sequential statements in VHDL. Provide examples to illustrate their usage in digital circuit design.	5	CO1
4(b)	Implement a full adder circuit in VHDL and exhibit its functionality using a test bench.	5	CO2

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Mid Term Examination

(Regular)

6<sup>th</sup> semester [B.Tech]

April 2024

Paper code: ECE-342T

Sub: Wireless Sensor Network

Time: 1.30hrs

Max.Marks:30

**Attempt Q.1 which is Compulsory and any two more Questions from remaining.**

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**Q.1 (a) Write the application and advantages of sensor networks**

[2] (CO1)

**(b) Write about contention-based MAC protocols.**

[2] (CO3)

**(c) How does adhoc network differ from wireless networks? Define.**

[2] (CO1)

**(d) Discuss the energy consumption of Sensor Nodes?**

[2] (CO3)

**(e) What are the Constraints and Challenges, Advantage of Sensor Networks?**

[2] (CO1)

**Q.2 (a) Explain in detail main sensor node hardware components with neat diagram.**

[5] (CO2)

**(b) Explain the need for Gateways and write about Wireless Sensor Network tunneling.** [5] (CO3)

**Q3. (a) Discuss the design considerations of physical layer and transceiver.**

[5] (CO1)

**(b) Explain hidden node and exposed node problem. How this problem can be solved?** [5] (CO3)

**Q.4. (a). Explain the types of wireless sensor Network Architecture in detail.**

[5] (CO2)

**(b) Discuss the Contention Based Reservation MAC Protocols with Scheduling Mechanisms.**

[5] (CO3)

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Enrolment No. \_\_\_\_\_

## MID TERM EXAMINATION

### B. TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April, 2024

Paper Code: HS-304

Subject: Universal Human Values

Time: 1½Hrs.

Max. Marks: 30

Note: Attempt Q.No.1, which is compulsory, and any two more questions from remaining.

S.No.	Questions	Max. Marks	CO(s)
1.(a)	What is Value Education and its roles in life?	2	[CO1]
(b)	Write the harmony at the various level of human being.	2	[CO1]
(c)	What is the difference between belief and right understanding?	2	[CO2]
(d)	What is the self-explorations?	2	[CO1]
(e)	Explain basic for harmony and contradiction in the self.	2	[CO3]
2.(a)	What do you mean by values? Explain in details and provide the solution of problems in the light of Resolution for human being.	5	[CO1]
(b)	What are the basic requirements for fulfilment of Human Aspirations?	5	[CO1]
3.(a)	Explain how the self and body are differ from each other.	5	[CO3]
(b)	Explain the activities and potentialities of the self.	5	[CO3]
4.	Explain the three important factors, which help in the holistic development as the transformation of consciousness to human consciousness.	10	[CO3]

ALL THE BEST!!!

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Exam Roll No. ....

## MID TERM EXAMINATION

VI SEMESTER [B. TECH.] APRIL 2024

Paper Code: PS-322T

Subject: EHV AC & HVDC Transmission

Time: 1Hour 30 Min.

Maximum Marks: 30

**Note: Attempt any Three questions including Q. No. 1 which is compulsory.**

Q1. (A) There has been a gradual increase in the level of transmission line voltage for long (2X5) Distance Transmission from 66kV to 765kV. What are the 3 major reasons behind this shift? (CO1)

(B) What is the impact of increase in transmission voltage on power transmission capacity and percentage power Loss.(CO1)

(C) How does the Reactive power flow in a transmission lines has a direct relation with the Voltage.(CO2)

(D) How can we generate High voltage AC and DC Voltages in labs for testing purpose?(CO1)

(E) Problem of Ferro resonance is predominant in EHV AC lines. Justify.(CO1)

Q2. (A) A three phase 440kV, 50Hz line consists of 3.5cm radius conductors spaced 5m apart. If the temperature is 20 degrees centigrade and the atmospheric pressure is 75cm, the irregularity factor is 0.8,determine the Corona Loss per km of the line.(CO1) (5)

(B) What is the impact of introducing FACTS controller in the grid? Justify. (CO1) (5)

Q3. (A) Derive equations to determine the performance of long transmission line. Also draw the Nominal pi Equivalent circuit of the line. (CO1) (5)

(B) Show the role of Series-Shunt type of FACTS controller in power system.(CO2) (5)

Q4. (A) Measurement of Extra High Voltages is possible using two important methods? Based on the voltage level discuss the two methods in detail. (CO1) (5)

(B) Discuss the difference between Series and Shunt Compensation based on their application in power system.(CO2) (5)

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MID TERM EXAMINATION

B. TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

6<sup>th</sup> Semester, April, 2024

Paper Code: ETEC 326T

Subject: Optical Communication Systems and Networks (OCSN)

Time: 1½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	M	CO(s)
1 (a)	What are the three optical windows (transparent windows) and what is its significance.	2	CO1
(b)	Define critical incident angle and critical propagation angle in an optical fiber.	2	CO1
(c)	Enlist any four functions of the fiber optic cables.	2	CO1
(d)	Define chromatic dispersion in an optical fiber.	2	CO2
(e)	Give differences between micro bending and macro bending losses in an optic fiber.	2	CO2
2 (a)	Elaborate with suitable diagrams any one Vapor Phase Deposition Technique used to produce high quality optical fibers.	5	CO1
2 (b)	Draw and explain Optical Communication systems and discuss few advantages of it.	5	CO1
3 (a)	Elaborate the Cable Loss Factor or attenuation coefficient in an optical fiber. Derive an expression for total attenuation per unit fiber length.	4	CO2
3 (b)	The mean optical power received at fiber output is $2\mu\text{W}$ for a 6 km fiber with launched power of $60\mu\text{w}$ . i) Calculate overall attenuation loss in decibels assuming no connector losses. ii) Calculate signal attenuation per km of fiber. iii) Calculate over all attenuation for 8km fiber with splices at 1km intervals, each giving an attenuation of 1dB.	6	CO2
4 (a)	Draw i/p pulse, refractive index profile, mode propagation, o/p pulse showing difference between dispersion in Step Index multimode fiber, Graded Index Multimode Fiber and Step Index Single Mode Fiber.	4	CO2
4 (b)	A silica optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47. i) Determine the critical angle at core-cladding interface ii) The Numerical aperture and iii) Acceptance Angle in air for the fiber.	3	CO2
4 (c)	A multimode Step Index fiber with core diameter of $60\mu\text{m}$ and a relative index difference ( $\Delta$ ) of 1.5% is operating on wavelength of $0.85\mu\text{m}$ . If the core refractive index is 1.48 then estimate normalized frequency of the fiber (V) and number of guided modes. (Hint: For Step Index Fiber: $V^2/2$ )	3	CO2

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**MID TERM EXAMINATION**

**SIXTH SEMESTER (B.TECH), April 2024**

Paper code: VLSI-330T

Subject: VLSI

Time : 1 Hour 30 Minutes

Maximum Marks : 30

Note: Attempt three questions only.

1. Question No.1 is compulsory.
2. Attempt any two questions from the remaining three questions.

Q. No	Questions	Marks	CO mapping
Q 1 (a)	What is channel length modulation?	3	CO1
(b)	Explain full custom and semi-custom integration.	2	CO1
(c)	Draw the diagram of 3T DRAM	3	CO2
(d)	What is short circuit current in low power circuit design.	2	CO2
Q 2 (a)	Draw the circuit diagram for XOR and XNOR gates using CMOS logic.	5	CO1
(b)	Explain ASIC design flow.	5	CO1
Q 3 (a)	Explain 8-T SRAM design with read/write operation.	7	CO2
(b)	Differentiate pipelining and parallel processing in VLSI.	3	CO2
Q 4	Write short note ( <b>any two</b> )	10	
(a)	Fault models		CO1
(b)	ASIC methodologies		CO1
(c)	FPGA		CO2
(d)	High level synthesis as Y-chart		CO2

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## MID TERM EXAMINATION

### B. TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

VI Semester, April, 2024

Paper Code: MS 302

Subject: Principles of Management for Engineers

Time: 1½Hrs.

Max. Marks: 30

Note: Attempt Q.No.1 which is compulsory and any two more questions from remaining.

Q. No.	Attempt any four from Q1	Max. Marks	CO(s)
1	Elaborate on the following: a) Different Levels of Management b) Managerial Grid c) Importance of Organizational Culture d) Types of Plans e) Differentiate between Policies and Strategies.	10	CO1 CO1 CO1 CO2 CO2
2	a) In the dynamic landscape of management study, different environments play a crucial role in shaping organizational strategies and decision-making. Reflect on the impact of external environments on management practices.  b) Potential challenges are being faced by organisations while maintaining their commitment towards social responsibility. Illustrate with the help of example.	5 5	CO1 CO1
3	a) How leaders are different from managers? b) Compare transformational and transactional leaders along with an example.	5 5	CO2 CO2
4	a) Planning is an all pervasive and continuous function of management" Discuss the features of planning in the light of above statement.  b) Compare and analyse the Symbolic and Omnipotent views of management.	5 5	CO2 CO1

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## MID TERM EXAMINATION

### B.TECH PROGRAMMES (UNDER THE AEGIS OF USICT)

VI Semester, April, 2024

Paper Code: EEE 340T

Subject: Electric Drives

Time: 1½ Hrs.

Max. Marks: 30

Note: Attempt Q. No. 1 which is compulsory and any two more questions from remaining.

Q. No.	Question	Max. Marks	CO(s)
1 (a)	What is meant by load equalization, how it can be achieved?	3	CO1
(b)	Explain the concept of steady state stability.	2	CO1
(c)	Explain the concept of regenerative braking of DC motor.	2	CO2
(d)	Explain the selection of power rating for drive motors with regard to thermal loading.	3	CO1
2 (a)	Explain ward Leonard speed control method of DC motor.	5	CO2
(b)	A 230V dc series motor runs at 1000rpm while taking a current of 100 A. The armature and field winding resistance are 0.1 ohm each. The motor is operated under dynamic braking at twice the rated torque and 800 rpm speed. Find the value of braking current and braking resistor.	5	CO2
3(a)	Explain four quadrant operation of Electric Drive with the help of hoist load working.	5	CO3
(b)	A 220V, 1500 rpm separately excited dc motor has rated armature current of 10A, the armature resistance is 3 ohms. It is fed through fully controlled converter from 230 V, 50 Hz supply. Find firing angle of converter for half the rated torque at 600 rpm. (assume torque is proportional to armature current).	5	CO2
4(a)	Explain the concept of phase locked loop control of electric drives.	5	CO1
(b)	Explain the function of various component used in Electrical Drive. Give the classification of Electrical Drives.	5	CO1