Sri Indu
College of Engineering & Technology
UGC Autonomous Institution
Recognized under 2(f) & 12(B) of UGC Act 1956,
NAAC, Approved by AICTE &
Permanently Affiliated to JNTUH

Estd.2001

NAAC
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

HANDOUT

II Year II Semester

DEPARTMENT OF AI&DS

ACADEMIC YEAR 2025-2026

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA, NAAC)
Sheriguda Village, Ibrahimpatnam Mandal, Ranga Reddy Dist. – 501 510

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

HANDOUT- INDEX

S. No	Contents
1	Vision, Mission, PEOs, POs, PSOs & Cos
2	Institution Academic Calendar
3	Department Academic Calendar
4	Subject wise
i)	Syllabus Copy
ii)	Lesson Plan
iii)	Question Bank
iv)	End Examination Questions (Model Paper)
v)	Mid-1 & Mid-2 Questions (Model Paper)

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF AI&DS

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DEPARTMENT VISION

To develop competent engineers in the domain of Artificial Intelligence & Machine Learning for note worthy contributions to the society.

DEPARTMENT MISSION

DM1: To strengthen academic collaborations for better exposure.

DM2: Promote professional environment to imbibe ethical values and entrepreneurial skills

DM3: Encourage research & development by emphasizing on innovation

DM4: Facilitate Industry-Institute collaboration for mutual benefit

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Generate contributions towards advancements in Artificial Intelligence and Machine Learning

PEO2: Promote design, research and implementation of products through strong communication skills, leadership and entrepreneurial skills.

PEO3: Apply basic principles and practices of AIML to successfully complete Software related projects to meet customer business objectives and/or productively engage in research.

Program Outcomes(POs)

PO1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO3	**Design/Development of Solutions:** Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4	**Conduct Investigations of Complex Problems**: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5	**Engineering Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO6	**The Engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7	**Ethics**: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8	**Individual and Collaborative Team work:** Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9	**Communication**: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO10	**Project Management and Finance**: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11	**Life-Long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Program Specific Outcomes(PSO's)

PSO1	Register mathematical methodology to crack problems using suitable data structures.
PSO2	Competence to design and develop software for web based and mobiles androids under real world environment.
PSO3	Skill to design the algorithms for machine learning, data compression can be used in different applications.

COURSE OUTCOMES (CO's)

Academic Year: 2025-26

Class **:** II YEAR-II SEM**.**

Course Name : INTRODUCTION TO ARTIFICIAL INTELLIGENE

At the end of the course, the student will be able to

C223.1	Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
C223.2	Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
C223.3	Learn different knowledge representation techniques.
C223.4	Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities
C223.5	Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
C223.6	Analyze Supervised Learning Vs. Learning Decision Tree.

COURSE ARTICULATION MATRIX

Course Outcome	PO1	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PS O3
C223.1	3	2	-	-	-	-	-	-	-	-	-	2	3	3	-
C223.2	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
C223.3	2	2	3	3	-	-	-	-	-	-	-	2	3	2	-
C223.4	3	2	3	3	-	-	-	-	-	-	-	2	3	3	-
C223.5	2	-	2	2	3	-	-	-	-	-	-	2	2	3	-
C223.6	3	-	-	-	3	-	-	-	-	-	-	-	3	3	-
C223	**3**	**1.5**	**1.8**	**1.3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1.3**	**3**	**2.7**	**-**

INSTITUTION ACADEMIC CALENDAR

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
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Sheriguda (V), Ibrahimpatnam, R.R.Dist, Hyderabad - 501 510

D4

ANNEXURE -III

BR-22

Lr.No.SICET/AUTO/DAE/II B.Tech Academic Calendar/30/2025

B.TECH II-YEAR I-SEM & II-SEM ACADEMIC CALENDAR
(FOR ACADEMIC YEAR : 2025-26)

Academic Calendar for B.Tech – II[nd] Year Students (2024 - 25 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	**Commencement of class work.**	**01.08.2025 (Monday)**	
2.	1st Spell of Instructions for covering First Two and a half Units.	01.08.2025 –07.10.2025	9 Weeks
3.	I Mid Term Examinations.	08.10.2025 –10.10.2025	3 Days
4.	Submission of I Mid Term Examination Marks.	16.10.2025	
5.	2nd Spell of Instructions for Remaining Two and a half Units.	13.10.2025 – 13.12.2025	9 Weeks
6.	II Mid Term Examinations.	15.12.2025 – 17.12.2025	3 Days
7.	Preparation Holidays and Practical Examinations	18.12.2025 – 27.12.2025	1 Week
8.	Submission of II Mid Term Examination Marks.	23.12.2025	
9.	I Semester End Examinations.	29.12.2025 – 10.01.2026	2 Weeks
Commencement of Class-Work for II B.Tech - II Semester 19.01.2026			

Note: No of Working/instructional days : 92

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	**Commencement of class work.**	**19.01.2026 (Monday)**	
2.	1st Spell of Instructions for covering First Two and a half Units.	19.01.2026 – 14.03.2026	8 Weeks
3.	I Mid Term Examinations.	16.03.2026 – 18.03.2026	3 Days
4.	Submission of I Mid Term Examination Marks.	24.03.2026	
5.	2nd Spell of Instructions for Remaining Two and a half Units.	20.03.2026 – 09.05.2026	7 Weeks
6.	Continuation of remaining 2nd Spell of Instructions	25.05.2026 – 10.06.2026	2 Weeks
7.	II Mid Term Examinations.	11.06.2026 –13.06.2026	3 Days
8.	Preparation Holidays and Project Evaluation.	15.06.2026 – 20.06.2026	1 Week
9.	Submission of II Mid Term Examination Marks.	18.06.2026	
10.	II Semester End Examinations	22.06.2026 – 04.07.2026	2 Weeks

Note: No of Working/instructional days : 92

ACE CE DIRECTOR PRINCIPAL

Controller of Examination
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510

DIRECTOR
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510

PRINCIPAL
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Sign:
Dr. M.V.S.S. Giridhar
Prof. of CEA; JNTUH Nominee

Sign:
Dr. T. Venu Gopal
Prof. of CSE; JNTUH Nominee

Sign:
Dr. D. Ramesh
Prof. of CSE; JNTUH Nominee

(Copy to DAP&E and Copy to all the Dept. Heads)

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

SYLLABUS

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

L	T	P	C
3	0	0	3

(R22CSM2214) INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Course Objectives:
- To learn the distinction between optimal reasoning Vs. human like reasoning.
- To understand the concepts of state space representation, exhaustive search, heuristic
- search together with the time and space complexities.
- To learn different knowledge representation techniques.
- To understand the applications of AI, namely game playing, theorem proving, and machinelearning.

Course Outcomes:
- Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
- Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
- Learn different knowledge representation techniques.
- Understand the concepts of state space representation, exhaustive search, heuristic searchtogether with the time and space complexities.
- Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
- Analyze Supervised Learning Vs. Learning Decision Trees

UNIT - I

Introduction to AI - Intelligent Agents, Problem-Solving Agents,
Searching for Solutions - Breadth-first search, Depth-first search, Hill-climbing search, Simulated annealing search, Local Search in Continuous Spaces.

UNIT-II

Games - Optimal Decisions in Games, Alpha–Beta Pruning, Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents, Logic- Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses.

UNIT-III

First-Order Logic - Syntax and Semantics of First-Order Logic, Using First Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification, Forward Chaining, Backward Chaining, Resolution.
Knowledge Representation: Ontological Engineering, Categories and Objects, Events.

UNIT-IV

Planning - Definition of Classical Planning, Algorithms for Planning with State Space Search, Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches. Hierarchical Planning.

UNIT-V

Probabilistic Reasoning:
Acting under Uncertainty, Basic Probability Notation Bayes' Rule and Its Use, Probabilistic Reasoning, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient

BR22 – B.TECH. –ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Representation of Conditional Distributions, Approximate Inference in Bayesian Networks, Relational and First- Order Probability.

TEXT BOOK:

1. Artificial Intelligence: A Modern Approach, Third Edition, Stuart Russell and Peter Norvig, Pearson Education.

REFERENCE BOOKS:

1. Artificial Intelligence, 3rd Edn., E. Rich and K. Knight (TMH)
2. Artificial Intelligence, 3rd Edn., Patrick Henny Winston, Pearson Education.
3. Artificial Intelligence, Shivani Goel, Pearson Education.
4. Artificial Intelligence and Expert systems – Patterson, Pearson Education.

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **Department of AI&DS**	**Prepared on 2026**
	Sub. Code & Title	**R22CSM2214 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE**
	Academic Year: 2025-26	**Year/Sem./Section** **II/II**
	Faculty Name & Designation	**P.RAMYA , Assistant. Professor**

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-I							**8**	
1.1	**Introduction to AI**	T1	19	49	Black Board	01		CO1,RB1
1.2	Intelligent Agents	T1	54	65	Black Board	01		CO1,RB2
1.3	Problem-Solving Agents	T1	81	84	Black Board	01		CO1,RB2
1.4	**Searching for Solutions -** Breadth-first search	T1	89	92	Black Board	01		CO1,RB2
1.5	Depth-first search	T1	96	102	Black Board	01		CO1,RB2
1.6	Hill-climbing search	T1	129	132	Black Board	01		CO1,RB1
1.7	Simulated annealing search,	T1	132	133	Black Board	01		CO1,RB2
1.8	Local Search in Continuous Spaces	T1	133	133	Black Board	01		CO1,RB1
	Review	**Signature of the HOD/Coordinator**						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **Department of AI&DS**	**Prepared on 2026**
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	Faculty Name & Designation	**P.RAMYA , Assistant. Professor**

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
	UNIT-II							
2.1	**Games**	T1	101	104	Black Board	01		CO2,RB2
2.2	Optimal Decisions in Games	T1	105	110	Black Board	02		CO2,RB1
2.3	Alpha–Beta Pruning,	T1	110	115	Black Board	01		CO2,RB1
2.4	Defining Constraint Satisfaction Problems	T1	116		Black Board	01		CO2,RB1
2.5	Constraint Propagation	T1	104	105	Black Board	01		CO2,RB2
2.6	Backtracking Search for CSPs	T1	116	122	Black Board	02		CO2,RB2
2.7	Knowledge-Based Agents	T1	187	188	Black Board	01		CO2,RB2
2.8	Logic	T1	188	198	Black Board	04		CO2,RB5
2.9	Propositional Logic	T1	200	206	Black Board	01		CO2,RB3
2.10	Propositional Theorem Proving	T1	812	814	Black Board	02		CO2,RB3
2.11	: Inference and proofs	T1	283	284	Black Board	01		CO2,RB2
2.12	Proof by resolution,	T1	285	289	Black Board	01		CO2,RB1
2.13	Horn clauses and definite clauses.	T1	290	291	Black Board	01		CO2,RB4

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **Department of AI&DS**	**Prepared on 2026**
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	Academic Year: 2025-26 | **Year/Sem./Section** | **II/II**	
	Faculty Name & Designation | **P.RAMYA , Assistant. Professor**	

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-III						**15**		
3.1	Process Synchronization	T1	225	227	Black Board	01		CO3,RB1
3.2	The Critical section Problem	T1	227	229	Black Board	01		CO3,RB3
3.3	Synchronization Hardware	T1	231	234	Black Board	01		CO3,RB2
3.4	Semaphores	T1	234	239	Black Board	01		CO3,RB1
3.5	Classic Problems of Synchronization	T1	239	244	Black Board	02		CO3,RB4
3.6	Critical Region ,Monitors	T1	244	252	Black Board	01		CO3,RB1
3.7	IPC on single Computer	T1	122	127	Black Board	01		CO3,RB2
3.8	IPC Mechanisms using pipes,FIFO	T1	128	139	Black Board	01		CO3,RB3
	Review	**Signature of the HOD/Coordinator**						

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Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-IV						**10**		
4.1	Logical & physical Address Space	T1	318	320	Black Board	01		CO4,RB2
4.2	Swapping	T1	322	324	Black Board	01		CO4,RB1
4.3	Contiguous Allocation	T1	324	328	Black Board	01		CO4,RB2
4.4	Paging	T1	328	337	Black Board	02		CO4,RB2
4.5	Segmentation, Segmentation with Paging	T1	344	345	Black Board	01		CO4,RB4
4.6	Demand Paging	T1	361	366	Black Board	01		CO4,RB2
4.7	Page Replacement	T1	369	372	Black Board	01		CO4,RB5
4.8	Page Replacement Algorithms	T1	373	380	Black Board	02		CO4,RB3
	Review	**Signature of the HOD/Coordinator**						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **Department of AI&DS**	**Prepared On 2026**
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	Faculty Name & Designation	**P.RAMYA , Assistant. Professor**

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-V						**10**		
5.1	File System Interface and Operation	T1	430		Black Board	01		CO5,RB2
5.2	Access methods	T1	430	433	Black Board	01		CO6,RB1
5.3	Directory Structure	T1	432	444	Black Board	01		CO5,RB3
5.4	Protection	T1	451	456	Black Board	02		CO6,RB3
5.5	File System Structure	T1	461	463	Black Board	01		CO5,RB3
5.6	Allocation methods	T1	471	478	Black Board	01		CO5,RB4
5.7	Free-space Management	T1	479	482	Black Board	02		CO5,RB2
5.8	Usage of open,read,write,close,lseek, stat,ioctl system calls	T1	424	425	Black Board	01		CO1,RB3
	Review	**Signature of the HOD/Coordinator**						

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

REFERENCE BOOKS:

Web links

W1: http://www.cse.iitd.ac.in/os-lectures/lec%201.mp4 W2: https://nptel.ac.in/courses/106106144/30
W3: https://nptel.ac.in/courses/106106144/9
w4: http://www.cse.iitd.ac.in/os-lectures/lec%2032.mp4 W5: https://nptel.ac.in/courses/106106144/32

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY LESSON PLAN (Regulation :R22) Department of AI&DS		Prepared on 2026
	Sub. Code & Title	R22CSM2214 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE	
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QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)
(1. REMEMBERING 2. UNDERSTANDING 3. APPLYING 4. ANALYSING 5. EVALUATING 6. CREATING)

UNIT – I			
OBJECTIVE QUESTIONS			
SL.NO		BT Level	Course Outcome
1C - 1	What is Artificial intelligence? a) Putting your intelligence into Computer b) Programming with your own intelligence c) Making a Machine intelligent d) playing a Game	I	CO1
1C - 2	What is an 'agent'? a) Perceives its environment through sensors and acting upon that environment through actuators b) Takes input from the surroundings and uses its intelligence and performs the desired operations c) A embedded program controlling line following robot d) All of the mentioned	I	CO1
1C - 3	Agents behavior can be best described by _____ a) Perception sequence b) Agent function c) Sensors and Actuators d) Environment in which agent is performing	I	CO1
1C - 4	Rational agent is the one who always does the right thing. a) True b) False	I	CO1
1C - 5	What kind of observing environments are present in artificial intelligence? a) Partial b) Fully c) Learning d) Both Partial & Fully	I	CO1
1C - 6	What is state space? a) The whole problem b) Your Definition to a problem c) Problem you design d) Representing your problem with variable and parameter	I	CO1
1C - 7	A search algorithm takes _____as an input and returns _____as an output. a) Input, output	I	CO1

	b) Problem, solution c) Solution, problem d) Parameters, sequence of actions		
1C - 8	A problem solving approach works well for _____ a) 8-Puzzle problem b) 8-queen problem c) Finding a optimal path from a given source to a destination d) Mars Hover (Robot Navigation)	I	CO1
1C - 9	Which search method takes less memory? a) Depth-First Search b) Breadth-First search c) Linear Search d) Optimal search	I	CO1
1C - 10	Which is the best way to go for Game playing problem? a) Linear approach b) Heuristic approach (Some knowledge is stored) c) Random approach d) An Optimal approach	I	CO1
1C - 11	_____are mathematical problems defined as a set of objects whose state must satisfy a number of constraints or limitations. a) Constraints Satisfaction Problems b) Uninformed Search Problems c) Local Search Problems d) All of the mentioned	I	CO1
1C - 12	Which of the Following problems can be modeled as CSP? a) 8-Puzzle problem b) 8-Queen problem c) Map coloring problem d) All of the mentioned	I	CO1
1C - 13	Which of the following are the two key characteristics of the Genetic Algorithm? (A). Crossover techniques and Fitness function (B). Random mutation and Crossover techniques (C). Random mutation and Individuals among the population (D). Random mutation and Fitness function (E). None of these	I	CO1
1C - 14	A loop that constantly moves in the direction of growing value that is uphill, ……. is an algorithm. (A). Up-Hill Search (B). Hill-Climbing (C). Hill algorithm (D). Reverse-Down-Hill search (E). None of these	I	CO1
1C - 15	Hill climbing is commonly known as ……search because it grabs a suitable neighbor state without being thoughtful onward about where to go next. (A). Needy local search (B). Heuristic local search	I	CO1

	(C). Greedy local search (D). Optimal local search		
FILL IN THE BLANKS			
1F - 1	Father of Artificial Intelligence _____	**I**	**CO1**
1F - 2	Solving a constraint satisfaction problem on a finite domain is an/a problem with respect to the domain size.	**I**	**CO1**
1F - 3	Language/Languages used for programming Constraint Programming includes _____	**I**	**CO1**
1F - 4	Agents behavior can be best described by _____	**I**	**CO1**
1F - 5	The Task Environment of an agent consists of _____	**I**	**CO1**
1F - 6	An agent is composed of _____	**I**	**CO1**
1F - 7	The Set of actions for a problem in a state space is formulated by a	**I**	**CO1**
1F - 8	The process of removing detail from a given state representation is called	**I**	**CO1**
1F - 9	The _____is a touring problem in which each city must be visited exactly once. The aim is to find the shortest tour.	**I**	**CO1**
1F - 10	A production rule consists of _____	**I**	**CO1**
1F - 11	Strategies that know whether one non-goal state is "more promising" than another are called _____	**I**	**CO1**
1F - 12	Depth-first search always expands the _____node in the current fringe of the search tree.	**I**	**CO1**
1F - 13	Breadth-first search always expands the _____node in the current fringe of the search tree.	**I**	**CO1**
1F - 14	Optimality of BFS is _____	**I**	**CO1**
1F - 15	DFS is _____efficient and BFS is _____efficient.	**I**	**CO1**
MATCH THE FOLLOWING			
1M - 1	A)Man Made + Thinking Power a)DFS B)Informed Search b)Architecture +program C)Uninformed Search c)Artificial Intelligence D)Agent d)Hill Climbing	**I**	**CO1**
1M - 2	A)Simple Reflex Agent a)Partially Observable B)Model Based Reflex Agent b) Informed Search C) Heuristic search c) Fully observable D) Blind Search d) Uninformed Search	**I**	**CO1**
1M - 3	A)Critic a)Improving Performance B)Problem Generator b)Generate Feedback C)Learning Element c)External Actions D)Performance Element d)Suggesting Actions	**I**	**CO1**
1M - 4	A)Real World Problem a)open List B)Standardized Problem b)Closed List C)Frontier c)Traveling Sales man problem D)Explored d)Vacuum Cleaner problem	**I**	**CO1**
1M - 5	A)BFS a)No internal Structure B DFS b)Greedy Local Search C)Hill Climbing c)O(bd) D)Atomic d)O(bm)	**I**	**CO1**
5 – MARKS QUESTIONS			

1D -1	Define AI. What are the applications of AI?	I	CO1
1D - 2	What is intelligent Agent? Write about Learning agents.	I	CO1
1D - 3	Discuss the about DFS search technique with the help of an example. Also discuss the benefits and shortcoming.	IV	CO1
1D - 4	What is hill climbing search? Explain with an example.	I	CO1
1D - 5	Describe Travelling Sales Problem (TSP) and its state representation with an example.	II	CO1
1D - 6	Write about problem solving agents and its standard steps.	I	CO1
1D - 7	What is Artificial Intelligence and Artificial Intelligence technique? Briefly explain how AI Technique can be represented and list out some of the task domain of AI.	I	CO1
1D - 8	Explain in detail about simple reflex and Model-Based Reflex agents.	I	CO1
1D - 9	What are the problems in Hill Climbing Search Methods?	I	CO1
1D - 10	What is simulated annealing search?	I	CO1
1D - 11	Compare and Contrast of DFS and BFS.	V	CO1
1D - 12	Explain the following with neat diagram: a. Goal Based Agents b. Utility Based Agents	II	CO1
1D - 13	Explain in detail about 8 Queens Problem.	I	CO1
1D - 14	Explain the Local Search in Continuous Spaces.	I	CO1
1D - 15	Discuss the about BFS search `technique in AI with the help of an example. What are the advantages and Dis-advantages?	IV	CO1

UNIT – II

OBJECTIVE QUESTIONS

.NO		BT Level	Course Outcome
1	In artificial Intelligence, knowledge can be represented as_____. i. Predicate Logic ii. Propositional Logic iii. Compound Logic iv. Machine Logic	I	CO2
2	To overcome the need to backtrack in constraint satisfaction problem can be eliminated by i. Forward Searching ii. Constraint Propagation iii. Backtrack after a forward search iv. Omitting the constraints and focusing only on goals	I	CO2
3	What is the complexity of minimax algorithm? i. Same as of DFS ii. Space – bm and time – bm iii. Time – bm and space – bm iv. Same as BFS	I	CO2
4	The maximum depth to which the alpha-beta pruning can be applied. i. Eight states ii. Six states iii. Ten states iv. Any depth	I	CO2
5	General algorithm applied on game tree for making decision of win/lose is _____ i. DFS/BFS Search Algorithms ii. Heuristic Search Algorithms iii. Greedy Search Algorithms iv. MIN/MAX Algorithms	I	CO2
6	Which search is similar to minimax search? i. Hill-climbing search ii. Depth-first search	I	CO2

	iii. Breadth-first search iv. All of the mentioned		
7	Tic-tac-toe is a------- game i. 1-ply ii. 2-ply iii. n-ply iv. None of these	**I**	**CO2**
8	Constraint Propagation technique actually modifies the CSP problem. a) True b) False	**II**	**CO2**
9	Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" a) ∀a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a) c) All of the mentioned d) None of the mentioned	**I**	**CO2**
10	The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as_____. i. Depth-first search ii. Breadth-first search iii. Alpha-beta pruning iv. None of the above	**I**	**CO2**
11	The beta value represents the _____bound on the value of a_____node i. Upper ,Maximizing ii. Lower ,Maximizing iii. Upper ,Minimizing iv. Lower , Minimizing	**I**	**CO2**
12	A) Knowledge base (KB) is consists of set of statements. B) Inference is deriving a new sentence from the KB. Choose the correct option. i. A is true, B is false ii. A is false, B is true iii. A is true, B is true iv. A is false, B is false	**I**	**CO2**
13	Which of the Following problems can be modeled as CSP? a) 8-Puzzle problem b) 8-Queen problem c) Map coloring problem d) All of the mentioned	**I**	**CO2**
14	To overcome the need to backtrack in constraint satisfaction problem can be eliminated by a) Forward Searching b) Constraint Propagation c) Backtrack after a forward search d) Omitting the constraints and focusing only on goals	**I**	**CO2**
15	There exist only two types of quantifiers, Universal Quantification and Existential Quantification. a) True b) False	**I**	**CO2**
	FILL IN THE BLANKS		
1	Constraint satisfaction problems on finite domains are typically solved using a form of	**I**	**CO2**
2	The search algorithm which is similar to the min max search, but removes the branches that don't affect the final output is known as_____.	**I**	**CO2**
3	Consider the two propositions. P: The sun rises in the east. Q: I will go for a walk if and only if the sun rises in the east. P ∧ Q will be _____.	**I**	**CO2**
4	Trees can be used to infer in Horn clause systems.	**I**	**CO2**

5	Adversarial search problems uses _____	**I**	**CO2**
6	How many logical connectives are there in artificial intelligence? a) 2 b) 3 c) 4 d) 5	**I**	**CO2**
7	Inference algorithm is complete only if _____	**I**	**CO2**
8	A _____is used to demonstrate, on a purely syntactic basis, that one formula is a logical consequence of another formula.	**I**	**CO2**
9	Wumpus World is a classic problem, best example of _____	**I**	**CO2**
0	In artificial Intelligence, knowledge can be represented as_____.	**I**	**CO2**
1	'α |= β '(to mean that the sentence α entails the sentence β) if and only if, in every model in which α is _____β is also _____ a) True, true	**I**	**CO2**
2	A knowledge-based agent can be defined with _____levels.	**I**	**CO2**
3	An AI agent perceives and acts upon the environment using____.	**I**	**CO2**
4	A Horn clause is a clause with _____positive literal.	**I**	**CO2**
5	P: It will rain. Q: I will sleep. The correct logic for the statement: ''If it rains, I will sleep.'' will be :	**I**	**CO2**
	MATCH THE FOLLOWING		
1	*A) Constraint Satisfaction* — *a) Forward* *B) Backtracking search* — *b) Map Coloring* *C) Arc* — *c) DFS* *D) Inference* — *d) Constraint*	**I**	**CO2**
2	A) Perfect information — a)DFS B) Imperfect information — b)Maximum Value C) Min-Max Algorithm — c) tic-tac-toe D) Alpha — d) Chess	**I**	**CO2**
3	A) (α ∧ β) ≡ (β ∧ α) — a) DeMorgan B) ((α ∧ β) ∧) ≡ (α ∧(β ∧)) — b) Distributivity C) ¬ (α ∧ β) ≡ (¬ α ∨ ¬β) — c) Commutativity D) (α ∧ (β ∨)) ≡ (α ∧ β) ∨(α ∧) — d) Associativity	**I**	**CO2**
4	A) Wumpus World Problem — a) 3 Levels B) knowledge-based agent — b) Boolean Logic C) Utility function — c) Partial& Global Information D) Propositional Logic — d)Terminal	**I**	**CO2**
5	A) $\frac{\alpha => \beta,\ \alpha}{\beta}$ — a) double-negation elimination B) $\frac{\alpha \wedge \beta}{\alpha}$ — b) Contraposition C) $\neg(\neg\alpha) \equiv \alpha$ — c) Modus Ponens D) $(\alpha => \beta) \equiv (\neg\beta => \neg\alpha)$ — d) And-Elimination	**I**	**CO2**
	5 – MARKS QUESTIONS		
1	Explain the Min-Max algorithm in detail with an example.	**I**	**CO2**
2	Explain the adoption of Alpha-Beta pruning for a two player in detail	**I**	**CO2**
3	How a constraint satisfaction problem (CSP) may be solved. R O A D S + C R O S S D A N G E R	**III**	**CO2**
4	State representation of facts in predicate logic with an example.	**II**	**CO2**
5	What is meant by Knowledge base? With a neat diagram explain its level.	**I**	**CO2**
6	Explain about Wumpus world problem.	**I**	**CO2**
7	Describe a procedure to converting a given sentence $B_{1,1} \Leftrightarrow (P_{1,2} \vee P_{2,1})$ to CNF.	**V**	**CO2**
8	What is proportional logic? How knowledge is represented by propositional logic.	**I**	**CO2**
9	Explain backtrack searching for Constraint Satisfaction Problem with map coloring Example	**II**	**CO2**

	problem.		
10	Show that the following formulae are logically equivalent using equivalence laws 1.(P∧ Q) ∨ (P∧ ¬ Q) ≡ P 2. P → (Q ∨ R) ≡ ¬ P ∨ Q ∨ R.	**III**	**CO2**
11	Suppose we are to find a proof by resolution of proposition P with respect to a set of axioms: Mary will get her degree only if she registered as a student and pass her exam. She has registered herself as a student. She has passed her exam .Show that she will get a degree.	**III**	**CO2**
12	Write about propositional theorem with inference and proofs.	**I**	**CO2**
13	Explain in detail about proof by resolution and write a procedure for converting sentence to CNF.$\mathbf{B_{1,1} \Leftrightarrow (P_{1,2} \vee P_{2,1})}$ Into CNF.	**III**	**CO2**
14	Differentiate Forward and Backward Chaining in clauses.	**V**	**CO2**
15	Explain in detail about Horn Clause and definite Clauses.	**I**	**CO2**

UNIT – III			
OBJECTIVE QUESTIONS			
.NO		**BT Level**	**Course Outcome**
1	Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" a) ∀ a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a) c) All of the mentioned d) None of the mentioned	**I**	**CO3**
2	First Order Logic is also known as _____ a) First Order Predicate Calculus b) Quantification Theory c) Lower Order Calculus d) All of the mentioned	**I**	**CO3**
3	There exist only two types of quantifiers, Universal Quantification and Existential Quantification. a) True b) False	**I**	**CO3**
4	A common convention is: • is evaluated first • and are evaluated next • Quantifiers are evaluated next • is evaluated last. a) True b) False	**I**	**CO3**
5	The adjective "first-order" distinguishes first-order logic from _____in which there are predicates having predicates or functions as arguments, or in which one or both of predicate quantifiers or function quantifiers are permitted. a) Representational Verification b) Representational Adequacy c) Higher Order Logic d) Inferential Efficiency	**I**	**CO3**
6	First-Order Logic is also commonly known as? (A). First Order Predicate Calculus (B). Quantification Theory (C). Lower Order Calculus (D). All of these	**I**	**CO3**

	(E). None of these		
7	The adjective first-order differentiates first-order logic from which of the following in which there are predicates having functions or predicates as arguments, or in which one or both of predicate quantifiers or function quantifiers are allowed. (A). Representational Verification (B). Higher-Order Logic (C). Representational Adequacy (D). Inferential Efficiency (E). None of these	**I**	**CO3**
8	Translate the given statement into First-order logic. "For every a, if a is a poet, then a is a writer" (A). ∃ a poet ((A). writer ((A). (B). ∀ a poet ((A). writer ((A). (C). All of these (D). None of these	**II**	**CO3**
9	A common convention is given below; is evaluated first and are evaluated next Quantifiers are evaluated next is evaluated last. (A). True (B). False (C). Partially true	**I**	**CO4**
10	A Term is either an individual constant (a 0-ary function), or a variable, or an n-ary function applied to n terms: F(t1 t2 ..tn). a) True b) False	**I**	**CO4**
11	Which of the following system is helpful to demonstrate, on a purely syntactic basis, that one formula is a logical consequence of another formula? (A). Search-Based Systems (B). Inductive Systems (C). Reasoning with Knowledge-Based Systems (D). Deductive Systems (E). None of these	**I**	**CO4**
12	Two types of quantifiers are Existential Quantification and Universal Quantification. (A). True (B). False	**I**	**CO4**
13	Which of the following are the two elementary types of inferences? (A). Reduction to propositional logic, Manipulate rules directly (B). Reduction to propositional logic, Apply modus ponen (C). Apply modus ponen, Manipulate rules directly (D). Convert each rule to Horn Clause, Reduction to propositional logic (E). None of these	**I**	**CO4**
14	Translate the given statement into FOL. "For each a, if a is a student of masters, then a has a bachelor's degree" (A). ∀ a masters((A). -> bachelors ((A). (B). ∃ a masters((A). -> bachelors ((A). (C). A is true, B is true (D). A is false, B is false	**I**	**CO4**

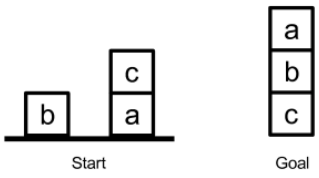
	(E). None of these		
15	Which of the following is not the style of inference? (A). Forward Chaining (B). Backward Chaining (C). Resolution Refutation (D). Modus Ponen (E). None of these	**I**	**CO4**
	FILL IN THE BLANKS		
1	A _____is used to demonstrate, on a purely syntactic basis, that one formula is a logical consequence of another formula.	**I**	**CO3**
2	The statement comprising the limitations of FOL is/are _____	**I**	**CO3**
3	The adjective “first-order” distinguishes first-order logic from _____in which there are predicates having predicates or functions as arguments, or in which one or both of predicate quantifiers or function quantifiers are permitted.	**I**	**CO3**
4	''Peter likes chocolates.'' Corresponding FOL is: _____	**I**	**CO3**
5	''All boys are cool.'' Corresponding FOL is: _____	**I**	**CO3**
6	Logic differ from the _____and _____while propositional logic commits only to the existence facts, first order logic commits to the existence of objects and relations.	**I**	**CO3**
7	Every student smiles Corresponding FOL is: _____	**I**	**CO3**
8	Every student who loves Mary is happy Corresponding FOL is: _____	**I**	**CO3**
	In Universal Instantiation the rule is written as _____	**I**	**CO4**
0	_____ used in backward chaining algorithm	**I**	**CO4**
1	_____ is a component of the system that applies logical rules to the knowledge base to deduce new information.	**I**	**CO4**
2	First order logic Statements contains_____.	**I**	**CO4**
3	_____ is based on categories and event calculus.	**I**	**CO4**
4	_____process makes two different Logical expressions look identical.	**I**	**CO4**
5	The variable is replaced by a new constant symbol is called _____	**I**	**CO4**
	MATCH THE FOLLOWING		
1	Following are basic elements of First order Logic syntax A) Predicates a) == B) Function b) ∧ ∨ ⇒ ⇔ C) Quantifier c) sqrt, LeftLegOf, D) Connectives d) Brother, Father, > … E) Equality e) ∀ ∃	**I**	**CO3**
2	Following Nested Quantifiers and Universal Quantifiers A) “All Kings are persons” a)∀x,y Brother(x, y) ⇒ Sibling(x, y) B) “Brothers are Siblings” b)∀x ∃y Loves(x,y) C) “Everybody Loves Somebody” c) ∀x King(x) ⇒ Person(x) D) “There is someone who is loved by everyone" d)∀y ∃x Loves(x,y)	**I**	**CO3**
3	A) Forward Chaining a) refutation proofs B) Backward Chaining b) Number of Arguments must be identical. C) Unification c) top-down approach. D) Resolution d) bottom to top approach.	**I**	**CO4**
4	A) Ontological Engineering a) Organizing subclass relations B) Taxonomy Hierarchy b) Organizing knowledge into category & sub category.	**I**	**CO4**

	C) Inheritance D) Probability mode	c) Attaches a number with each possibility d) representing concepts ,events ,time, physical concepts of different domains		
5	Universal instantiation Universal generalization Existential instantiation Existential generalization	a) P(c) for an arbitrary c b) ∀ xP(x) c) P(c) for some c d) ∃ xP(x)	**I**	**CO4**
	5 – MARKS QUESTIONS			
1	Write about Atomic sentences and Complex sentences with example.		**I**	**CO3**
2	Consider the following sentences *John likes all kinds of food *Apples are food *Chicken is food *Anything any one eats and isn't killed by is food *Bill eats peanuts and is still alive *Sue eats everything bill eats Translate these sentences into formulas in predicate logic Prove that john likes peanuts using backward chaining Convert the formulas of a part into clause form Prove that john likes peanuts using resolution.		**III**	**CO3**
3	Explain about Quantifiers a)Universal Quantifiers b) Existential Quantifiers.		**I**	**CO3**
4	What are the Nested Quantifiers? Explain with example.		**I**	**CO3**
5	What is knowledge-engineering? Explain the process.		**I**	**CO3**
6	Illustrate about first-order logic Vs propositional logic.		**IV**	**CO3**
7	What are Resolution Methods? Explain with examples.		**I**	**CO3**
8	Describe in detail about forward chaining with suitable example.		**II**	**CO4**
9	Explain in detail about categories and objects in knowledge representation.		**II**	**CO4**
10	Explain an algorithm for Unification algorithm. Discover the operation of the unification algorithm on each of the following pairs of literals: A. f(Marcus)and f(Caesar) B. f(x) and f(g(y)) C. f(Marcus(x,y))and f(x,g(Caesar, Marcus))		**V**	**CO4**
11	Explain in detail about Ontological Engineering.		**II**	**CO4**
12	*Describe about the approaches of Knowledge representation.*		**II**	**CO4**
13	With an example explain backward chaining.		**II**	**CO4**
14	What is the role of events in knowledge representation?		**I**	**CO4**
15	Differentiate forward chaining and Backward chaining.		**IV**	**CO4**

UNIT – IV			
OBJECTIVE QUESTIONS			
.NO		**BT Level**	**Course Outcome**
1	A plan that describe how to take actions in levels of increasing refinement and specificity is _____ a) Problem solving b) Planning c) Non-hierarchical plan d) Hierarchical plan	**I**	**CO5**
2	How many ways are available to solve the state-space search? a) 1 b) 2 c) 3 d) 4	**I**	**CO5**
3	In partial order plan.	**I**	**CO5**

	A. Relationships between the actions of the behavior are set prior to the actions B. Relationships between the actions of the behavior are not set until absolutely necessary Choose the correct option. a) A is true b) B is true c) Either A or B can be true depending upon situation d) Neither A nor B is true		
4	Following is/are the components of the partial order planning. a) Bindings b) Goal c) Causal Links d) All of the mentioned	**I**	**CO5**
5	The process by which the brain incrementally orders actions needed to complete a specific task is referred as _____ a) Planning problem b) Partial order planning c) Total order planning d) Both Planning problem & Partial order planning	**I**	**CO5**
6	Which data structure is used to give better heuristic estimates? a) Forwards state-space b) Backward state-space c) Planning graph algorithm d) None of the mentioned	**I**	**CO5**
7	Which is used to extract solution directly from the planning graph? a) Planning algorithm b) Graphplan c) Hill-climbing search d) All of the mentioned	**I**	**CO5**
8	What are present in the planning graph? a) Sequence of levels b) Literals c) Variables d) Heuristic estimates	**I**	**CO5**
9	What is the starting level of planning graph? a) Level 3 b) Level 2 c) Level 1 d) Level 0	**I**	**CO5**
10	What are present in each level of planning graph? a) Literals b) Actions c) Variables d) Both Literals & Actions	**I**	**CO5**
11	When will further expansion is unnecessary for planning graph? a) Identical b) Replicate c) Not identical d) None of the mentioned	**I**	**CO5**
12	To eliminate the inaccuracy problem in planning problem or partial order planning problem we can use _____data structure/s.	**I**	**CO5**

	a) Stacks b) Queue c) BST (Binary Search Tree) d) Planning Graphs		
13	Planning graphs consists of _____ a) a sequence of levels b) a sequence of levels which corresponds to time steps in the plan c) a sequence of actions which corresponds to the state of the system d) none of the mentioned	**I**	**CO5**
14	What is the other name of the backward state-space search? a) Regression planning b) Progression planning c) State planning d) Test planning	**I**	**CO5**
15	Conditional Plans allows the agent to sense the world during execution to decide what branch of plan to follow. a) True b) False	**I**	**CO5**
	FILL IN THE BLANKS		
1	What are not present in start actions_____	**I**	**CO5**
2	The other name for forward state-space search_____	**I**	**CO5**
3	_____ algorithms is used to extract the plan directly from the planning graph, rather than using graph to provide heuristic.	**I**	**CO5**
4	The STRIPS Representation is_____	**I**	**CO5**
5	How many possible plans are available in partial-order solution_____	**I**	**CO5**
6	Which algorithm places two actions into a plan without specifying which should come first_____	**I**	**CO5**
7	Incorrect information results in unsatisfied preconditions for actions and plans _____ detects violations of the preconditions for successful completion of the plan.	**I**	**CO5**
8	Standard planning algorithms assumes environment to be _____	**I**	**CO5**
	_____ planning allows the agent to take advice from the domain designer in the form of decomposition rules.	**I**	**CO5**
10	_____main advantage of backward state-space search	**I**	**CO5**
11	The famous spare tire problem or Scheduling classes for bunch of students or Air cargo transport are the best example of _____	**I**	**CO5**
12	To eliminate the inaccuracy problem in planning problem or partial order planning problem we can use _____data	**I**	**CO5**
13	Which of the following search belongs to totally ordered plan search_____	**I**	**CO5**
14	HTN Stands For_____	**I**	**CO5**
5	Hierarchical planning is a_____	**I**	**CO5**
	MATCH THE FOLLOWING		
1	Match the Following A)POP a)Forward state space search B)TOP b)Backward state space search C)BSSS c)Partial order Planning D)FSSS d)Total order Planning	**I**	**CO5**
2	Match the Following A)Schema a)A plan of action to achieve one's goals-is a critical part of AI B)Planning b) Planning Domain Definition Language C)PDDL c) a graphical representation that makes it easy to organize information D)STRIPS d) Stanford Research Institute Problem Solver.	**I**	**CO5**
3	Match the Following	**I**	**CO5**

	A)ADL a) Same action can carry next level without any changes B) Linearization b) Delaying a choice during search C)Mutex Relation c)Conflicts between Literals that cant occur together D)Persistent Action d) Action Description Language		
4	Match the Following A)Unachievable Literal Cost in planning graph a)Partial Order Planner B)Max-Level heuristic b)which level they all occur on without mutex links C)Set Level heuristic c)max level for any goal conjunct D)Nonlinear planner d) h(n)= ∞	**I**	**CO5**
5	Match the Following A) Inconsistent effects a)one of the preconditions of one action is mutually exclusive with a precondition of the other B) Interference b)one of the effects of one action is the negation of a precondition of other C) Competing needs c)one action negates an effect of another D) Hierarchical planning d) a planning approach that involves organizing tasks and actions into multiple levels of abstraction	**I**	**CO5**
	5 – MARKS QUESTIONS		
1	What is meant by classical planning with example?	**I**	**CO5**
2	Explain the basic representations for planning.	**II**	**CO5**
3	What is a planning agent explain types of planning.	**I**	**CO5**
4	What is planning and what the components of planning system.	**I**	**CO5**
5	With an graph plan algorithm explain its process.	**V**	**CO5**
6	Differentiate Forward state space search and Backward State space search. with example	**IV**	**CO5**
7	Write about Example :Spare Tire problem	**III**	**CO5**
8	What is State space search? Explain its properties.	**I**	**CO5**
9	Write down STRIPS-STYLE operators that correspond to following block world description. 	**III**	**CO5**
10	What is Hierarchical planning and Hierarchical Task Network?	**I**	**CO5**
11	What is POP (partial order planning).with example.	**I**	**CO5**
12	Write about A PDDL Description of an AIR CARGO Transportation planning problem	**III**	**CO5**
13	Explain the algorithms in state space search to evaluate a)FSSS b)BSSS	**IV**	**CO5**
14	Explain planning with hierarchical decompositions models.	**II**	**CO5**
15	Explain Analysis of planning Approches.	**II**	**CO5**
	UNIT – V		
	OBJECTIVE QUESTIONS		
.NO		**BT Level**	**Course Outcome**
1	Where does the bayes rule can be used? a. Solving queries b. Increasing complexity c. Decreasing complexity d. Answering probabilistic query	**I**	**CO6**
2	The Bayesian Network gives_____	**I**	**CO6**

	a. A complete description of the problem b. Partial Description of the domain c. A complete description of the domain d. None of the above		
3	What is used for probability theory sentences? a. Conditional logic b. Logic c. Extension of propositional logic d. None of the mentioned	**I**	**CO6**
4	Which of the given statement is true for Conditional Probability? a. Conditional Probability gives 100% accurate results. b. Conditional Probability can be applied to a single event. c. Conditional Probability has no effect or relevance on independent events. d. None of the above.	**I**	**CO6**
5	After applying conditional Probability to a given problem, we get_____ a. 100% accurate result b. Estimated Values c. Wrong Values d. None of the above	**III**	**CO6**
6	Where does the dependence of experience is reflected in prior probability sentences? a. Syntactic distinction b. Semantic distinction c. Both Syntactic & Semantic distinction d. None of the mentioned	**I**	**CO6**
7	A Hybrid Bayesian network contains _____ a. Both discrete and continuous variables b. Only Discrete variables c. Only Discontinuous variable d. Both Discrete and Discontinuous variable	**I**	**CO6**
8	If a hypothesis says it should be positive, but in fact it is negative, we call it _____ a. A consistent hypothesis b. A false negative hypothesis c. A false positive hypothesis d. A specialized hypothesis	**I**	**CO6**
9	Which is true for Decision theory? a. Decision Theory = Probability theory + utility theory b. Decision Theory = Inference theory + utility theory c. Decision Theory = Uncertainty + utility theory d. Decision Theory = Probability theory + preference	**I**	**CO6**
10	How the entries in the full joint probability distribution can be calculated? a. Using variables b. Using information c. Both Using variables & information d. None of the mentioned	**I**	**CO6**
11	How the bayesian network can be used to answer any query? a. Full distribution b. Joint distribution c. Partial distribution d. All of the mentioned	**I**	**CO6**
12	How the compactness of the bayesian network can be described? a. Locally structured b. Fully structured c. Partial structure	**I**	**CO6**

	d. All of the mentioned		
13	What is the consequence between a node and its predecessors while creating bayesian network? a. Functionally dependent b. Dependant c. Conditionally independent d. Both Conditionally dependant & Dependant	**I**	**CO6**
14	Which condition is used to influence a variable directly by all the others? a. Partially connected b. Fully connected c. Local connected d. None of the mentioned	**I**	**CO6**
15	How many terms are required for building a bayes model? a. 1 b. 2 c. 3 d. 4	**V**	**CO6**
	FILL IN THE BLANKS		
1	a representation of the set of all possible world states.	**I**	**CO6**
2	Bayes' Theorem States that_____	**III**	**CO6**
3	A joint probability distribution that covers the complete set of random variables is called as _____	**I**	**CO6**
4	Conditional Probability can be written in a different form called the _____	**I**	**CO6**
5	The table used to representing conditional distribution is_____	**I**	**CO6**
6	Decision theory = _____+ _____	**I**	**CO6**
7	of an event is probability computed before observing new information.	**I**	**CO6**
8	An extension of Bayesian networks called_____	**I**	**CO6**
	The probability that is calculated after all evidence or information has taken into account is called_____	**I**	**CO6**
0	Event B has already occurred, "the probability of A under the conditions of B", it can be written as_____	**III**	**CO6**
1	Bayesian Belief network is also known as_____	**I**	**CO6**
2	is called as **Bayes' rule.**	**III**	**CO6**
3	A network with both discrete and continuous variables is called_____	**I**	**CO6**
4	Agents may need to handle_____due to partial observability.	**I**	**CO6**
5	If the probability of A is given and we need to find the probability of B, then it will be given as_____	**I**	**CO6**
	MATCH THE FOLLOWING		
1	a)Belief — A) Prior b)Probability Theory — B) Posterior c)Unconditional — C)Keeping Track d)Conditional — D)Degrees of Belief	**I**	**CO6**
2	a) product Rule — A) 1-Probability(Failure) b) Probability (success) — B)P(H/E)=P(H and E)/P(E) c) Probability (Failure) — C)P(a^b)=p(a/b)P(b) d) Conditional Probability — D)1- Probability (success)	**I**	**CO6**
3	a) Decision Theory= — A)Probability Theory + Utility Theory b) Product Rule — B)P(a^b)=P(a/b)P(b) c) Inclusion-exclusion Principle — C)P(avb)=P(a)+P(b)-P(a^b) d) hybrid Bayesian network — D) A type of Bayesian network with continuous and discrete variables.	**I**	**CO6**
4	a) P(A|B) = (P(B|A) * P(A)) / P(B) — A) prior probability b) P(A|B) — B) marginal probability c) P(A) — C)posterior d) P(B) — D) Bayes' Rule	**I**	**CO6**

5	a)Bayesian networks b)probability theory c) Joint probability distribution d)Polytrees	A)Singly Connected B)Different combination C)prediction D) probabilistic graphical model	**I**	**CO6**
	5 – MARKS QUESTIONS			
1	With a formula explain Baye's theorem.		**V**	**CO6**
2	With diagram explain about Bayesian Belief Network.		**III**	**CO6**
3	Write about basic probability notations.		**II**	**CO6**
4	Define uncertainty and Rational Decision.		**IV**	**CO6**
5	List out Basic Probability notations and .Explain it.		**I**	**CO6**
6	Explain Hybrid Bayesian network.		**V**	**CO6**
7	Explain the Following a)Prior Probability b)Posterior Probability		**II**	**CO6**
8	Consider the choice of parents for M calls, M calls is certainly influenced by whether there is a burglary or an earthquake, but not directly influenced. Institutively, our knowledge of the domain tells us that these events influence M's calling behavior only through their effect on the alarm. Also given the state of the alarm, whether J calls has no influence on M's calling. Formally speaking, we believe that the following conditional independence statement holds: P(M Calls |J Calls, Alarm, Earthquake, Burglary) = P(M calls | Alarm).		**IV**	**CO6**
9	Explain in detail about Conditional Gaussian with an example.		**II**	**CO6**
10	Define uncertainty. How it is solved.		**I**	**CO6**
11	What are the efficient representations of conditional distributions?		**I**	**CO6**
12	Describe about Rejection Sampling in Bayesian networks.		**II**	**CO6**
13	Explain about Inference by Markov Chain simulation.		**II**	**CO6**
14	Explain in detail about relational and First-order probability.		**II**	**CO6**
15	Write about direct Sampling method with an example.		**I**	**CO6**

Subject Code No.: **R22CSM2214**

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)
Recognized under 2(f) and 12(B) of UGC Act 1956

INTRODUCTION TO ARTIFICIAL INTELLIGENE

Year: II Sem:II

Time: 3 Hours **Max Marks: 60**

Part – A **(10Q X 1M = 10 Marks)**

Answer *All* Questions			Marks	Course outcome.	BT Level
1	a	What is AI? Who is the Father of AI?	**(1)**	CO1	I
	b	How many types of Exhaustive searches?	**(1)**	CO1	I
	c	Explain MINIMAX Algorithm.	**(1)**	CO2	II
	d	How many types of Inference mechanisms .What are they?	**(1)**	CO2	III
	e	Which inference technique is NOT used in First-Order Logic?	**(1)**	CO3	I
	f	How does Backward Chaining differ from Forward Chaining?	**(1)**	CO4	III
	g	Define classical planning.?	**(1)**	CO4	I
	h	Explain hierarichical planning.?	**(1)**	CO5	II
	i	Define Dempster-Shafer Theory?	**(1)**	CO6	I
	J	Explain Bayes' theorem?	**(1)**	CO6	II

Part – B **(5Q X 10M = 50 Marks)**

Answer all questions choosing ***ONE*** from each unit.		Marks	Course outcome.	BT Level
2	**UNIT - I** (a) Enumerate classical "Water jug problem". Describe the state space for the problem and also give the solution (OR) (b) Discuss any two from the following heuristic search techniques.Explain the algorithm with the help of an example. i) Hill climbing ii) Best-first search iii) A* Algorithm	**(10)**	**V** II	**CO1**
3	**UNIT - II** (a) Explain how a constraint satisfaction problem (CSP) may be solved. (March -2021) R O A D S + C R O S S D A N G E R (OR) (b) Explain the adoption of Alpha-Beta pruning for a two player in detail.	**(10)**	V II	CO2
4	**UNIT - III** (a)Explain Knowledge Engineering in First-Order Logic.	**(10)**	II	CO3

	(OR) (b) Describe Reasoning Systems for Categories in knowledge representation		III	CO4
5	**UNIT - IV** (a) Compare contingent planning and online replanning. (OR) (b) Explain planning graphs with "have cake and eat cake too" problem?	**(10)**	IV II	CO5
6	**UNIT - V** (a)Disucss in detail about supervised learning? (OR) (b) Explain Inference using Full Joint Distributions in Uncertain Knowledge and Learning Uncertainty.	**(10)**	IV V	CO6 CO6