

Name:  
Reg. No. :

**Rajagiri College of Social Sciences (Autonomous)**  
**Second semester MCA Degree Examination**  
**April, 2022**  
**(Regular/Supplementary – 2020 admission onwards)**

**Code: 4120**

**Sub: (MCA205) Artificial Intelligence**

**Max. Weightage: 30**

**Duration: 3 Hrs.**

**SECTION A**

*Answer any **TEN** questions.  
(Each question carries a weightage of 1)*

[ $10 \times 1 = 10$ ]

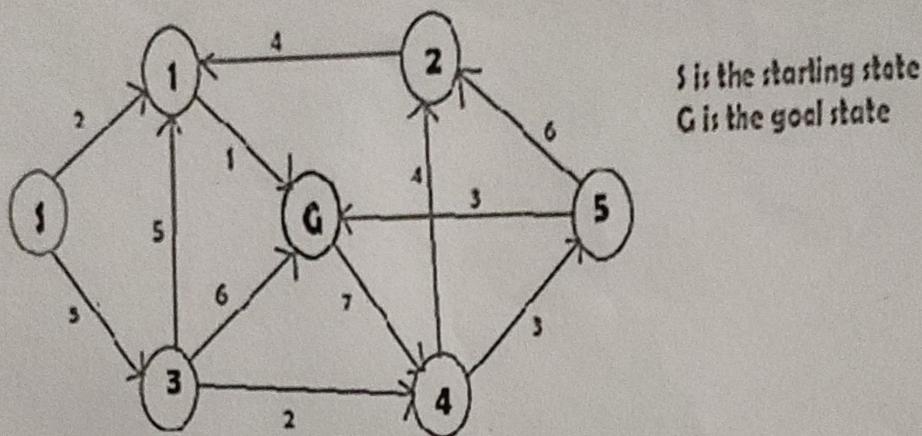
- 1 Construct a truth-table and show that the rule of inference in Propositional logic?
- 2 Write notes on generalized Modus Ponens.
- 3 Create a structure of blackboard architecture.
- 4 Define a Model based expert system?
- 5 Explain supervised learning with an example?
- 6 Explain different types of agents?
- 7 Prove "I am a descendent of Thomas Jefferson" Which strategy of state space search will be suitable for the statement?
- 8 What is conceptual dependency and describe the basic combination Action primitives?
- 9 What are the sources of Uncertainty in AI?
- 10 Define Reinforcement Learning.
- 11 Write short notes on propositional logic.
- 12 Discuss the properties needed for an Intelligent Agent.

**SECTION B**

*Answer **ALL** questions.  
(Each question carries a weightage of 4)*

[ $5 \times 4 = 20$ ]

- 13 (a) Explain knowledge representation in detail.  
**[OR]**  
(b) Illustrate a summarized table for Logic Connectives in Propositional calculus?
- 14 (a) Explain A\* algorithm with suitable examples?  
**[OR]**  
(b) Which solution would UCS find to move from node S to node G if run on the graph below? Also write suitable algorithm and complexities of the following graph.



~~15~~ (a) Write briefly about conceptual graph with suitable examples showing the difference of individual and generic marker?

[OR]

(b) Write the syntax rules of conceptual dependency.

~~16~~ (a) Explain the ADT set and priority queue in detail?

[OR]

(b) Explain Fuzzy Logic system? Give suitable examples.

~~17~~ (a) Perform a comparison between Supervised and Reinforcement learning.

[OR]

(b) Discuss genetic algorithm with suitable example?

Name: Sweaka V. S

Roll No: 59



## Rajagiri College of Social Sciences (Autonomous)

### Continuous Assessment Examination - 1

January 2023

II MCA

Code: MCA205

Total Time

: 90 minutes

Sub: Artificial Intelligence

Total Marks

: 40

Level	Blooms Taxonomy Levels of Learning
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Evaluating
L6	Creating

### SECTION A

Each Question has 10 marks

Sl.no	Question	CO Mapped	Bloom's Taxonomy level
1	What is the process of Unification? Attempt to unify the following pairs of expressions and justify the result a) $p(X,X)$ and $p(a,b)$ b) $\text{ancestor}(X, \text{father}(X))$ and $\text{ancestor}(\text{david}, \text{george})$ - Embedded Question	MCA205.1	L1
2	List and explain any five applications of AI in the real-world scenario.		

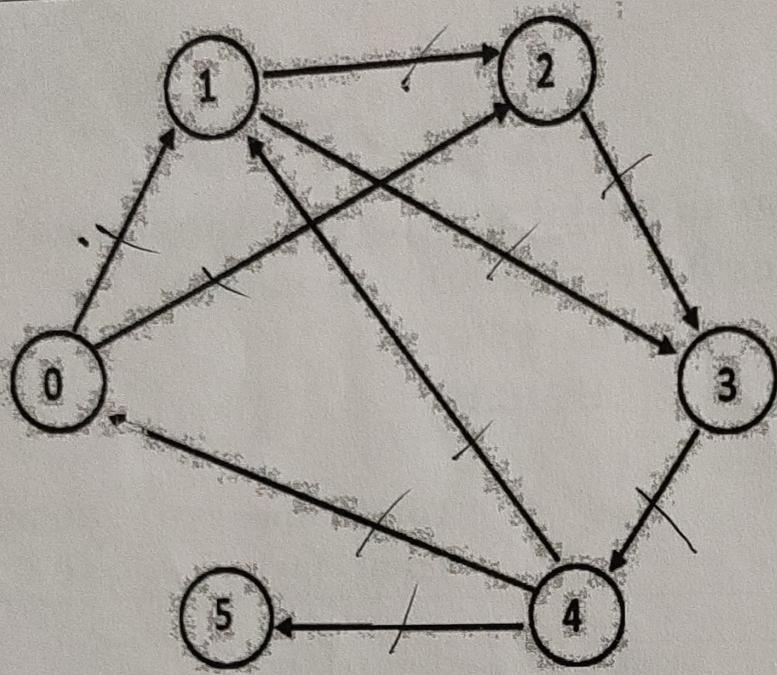
OR

3	Prove hypothetical syllogism and disjunctive syllogism using truth tables.
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### SECTION B

Each Question has 10 marks

4	Explain the BFS algorithm. Illustrate BFS in the following problem with 0 as start state and 5 being goal state using relevant data structures.	MCA205.2	L2
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- Embedded Question

- 5 Compare and contrast uninformed and informed search strategies. Explain any one informed search strategy with suitable example.

**OR**

- 6 Compare and contrast backward and forward chaining. Illustrate with suitable examples.

**Rajagiri College of Social Sciences (Autonomous)**  
**Continuous Assessment Examination - 1**  
**January 2022**  
**II MCA**

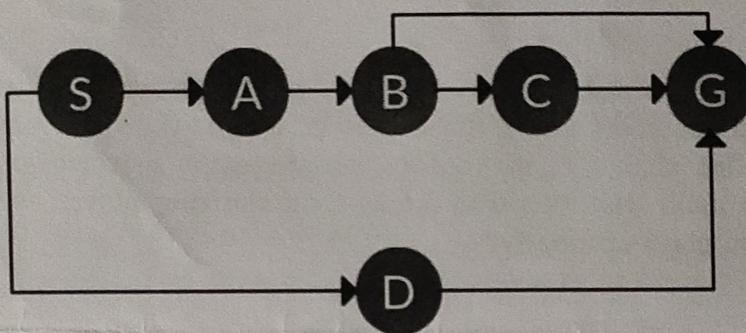
**Code: MCA205**  
**Sub: Artificial intelligence**

**Total Time : 1 hr**  
**Total Weightage : 16**

**SECTION A**

*Each question has a weightage of 4*

1. Which solution would DFS find to move from node S to node G if run on the graph below? – (Embedded Question – Compulsory)



2. Construct a truth-table and show that the rule of inference in Propositional logic?

**OR**

3. Explain the techniques of Knowledge representation? Which one of the following is the most appropriate logical formula to represent the statement? "**Gold and silver ornaments are precious**". The following notations are used:

$G(x)$ :  $x$  is a gold ornament

$S(x)$ :  $x$  is a silver ornament

$P(x)$ :  $x$  is precious

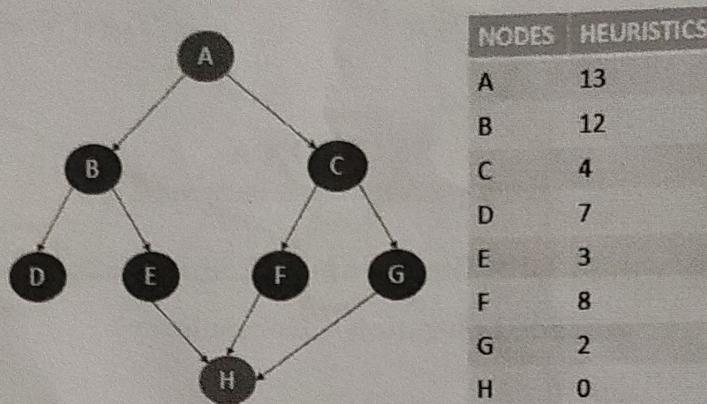
- (A)  $\forall x(P(x) \rightarrow (G(x) \wedge S(x)))$
- (B)  $\forall x((G(x) \wedge S(x)) \rightarrow P(x))$
- (C)  $\exists x((G(x) \wedge S(x)) \rightarrow P(x))$
- (D)  $\forall x((G(x) \vee S(x)) \rightarrow P(x))$

**P.T.O**

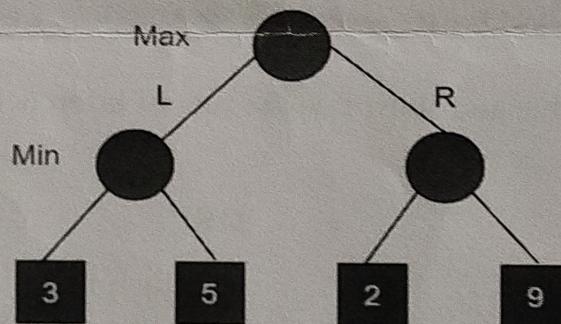
## SECTION B

*Each question has a weightage of 4*

4. Explain the different categories of Heuristic Search Technique? Find the path from A to H using greedy search. (The heuristic values  $h$  of each node is given.) – (Embedded Question – Compulsory)

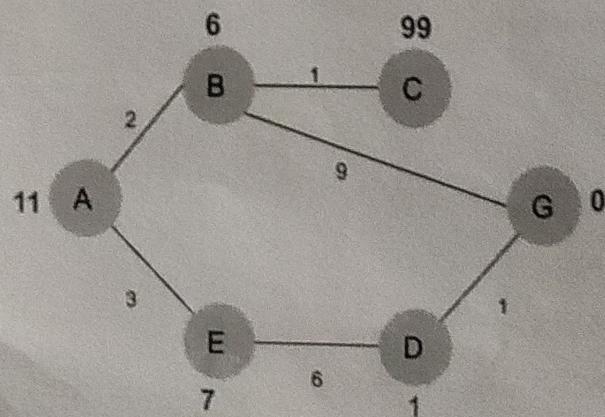


5. Consider a game which has 4 final states and paths to reach final state are from root to 4 leaves of a perfect binary tree as shown below. Assume you are the maximizing player and you get the first chance to move, i.e., you are at the root and your opponent at next level. **Which move you would make as a maximizing player considering that your opponent also plays optimally?**



**OR**

6. Find the path to reach from A to G using A\* search. (The heuristic values  $h$  of each node are marked as red)



**Rajagiri College of Social Sciences (Autonomous)**  
**Continuous Assessment Examination - 1**  
**January 2022**  
**II MSc-CS(DA204)**

**Code: MSCSDA204**  
**Sub: Artificial intelligence**

**Total Time : 1 hr**  
**Total Weightage : 16**

**SECTION A**  
*Each question has a weightage of 4*

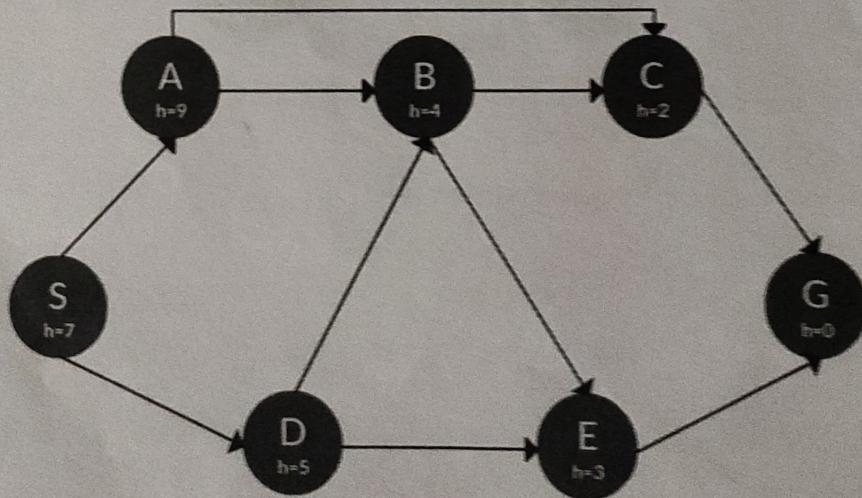
1. With the help of truth table and suitable example, deliberate on inference rule in predicate calculus – (Embedded Question – Compulsory)
2. What is Knowledge representation? Explain the techniques of knowledge representation scheme?

**OR**

3. Explain Quantifiers and its types? Express the Following in Predicate Calculus: -
  - a) Some language is spoken by everyone in this class.
  - b) Everybody loves somebody sometime
  - c) Roses are red

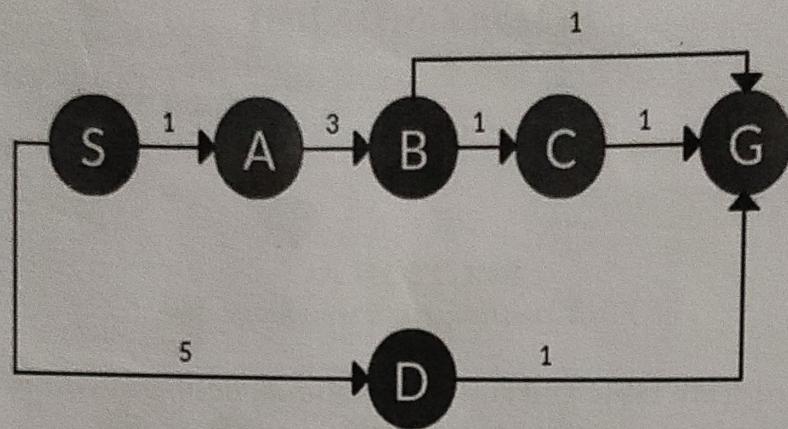
**SECTION B**  
*Each question has a weightage of 4*

4. What is Heuristic Search Technique? Find the path from S to G using greedy search. (The heuristic values h of each node below the name of the node.) – (Embedded Question – Compulsory)



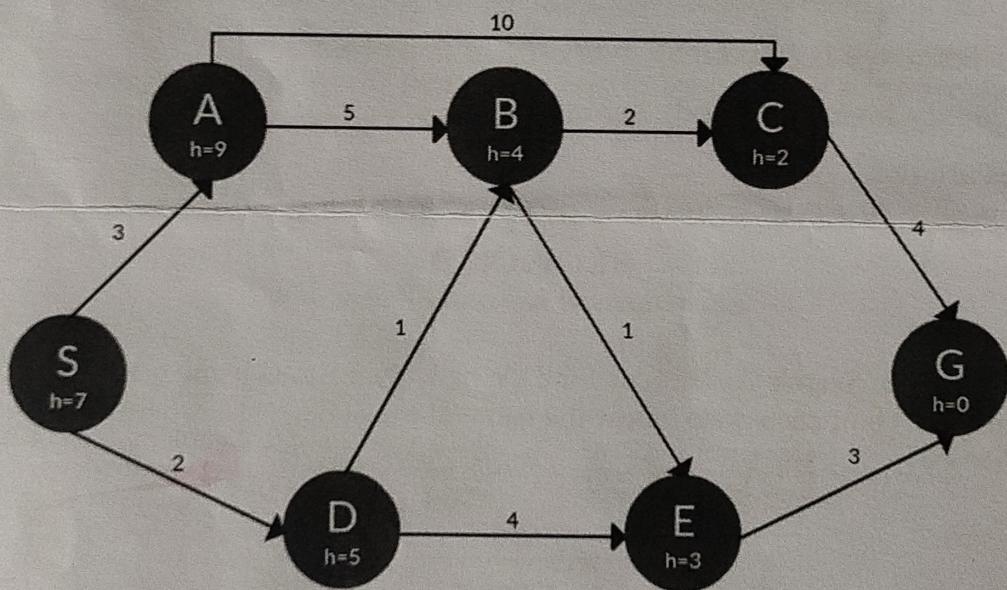
**P.T.O**

5. Which solution would UCS find to move from node S to node G if run on the graph below?



OR

6. Find the path to reach from S to G using A\* search.



Name: Sreeaba  
Reg. No.:

Rajagiri College of Social Sciences (Autonomous)

Second semester MCA Degree Examination

April, 2023

(Regular – 2022 admissions)

Code: 4545

Sub: (MCA205) Artificial Intelligence

Max. Marks: 75

Duration: 3 Hrs.

**SECTION A**

Answer any **TEN** questions.  
(Each question carries 3 marks)

[10 X 3 = 30]

- 1 Define Quantifier and it's type.
- 2 Write notes on heuristic search.
- 3 Demonstrate a structure for semantic network with suitable example.
- 4 What are the sources of uncertainty in AI?
- 5 What is Machine Learning?
- 6 Construct a truth table showing  $\neg A \vee B$  and  $A \rightarrow B$  are logically equivalent.
- 7 Explain A\* algorithm.
- 8 Write an algorithm for Unification.
- 9 Describe an Expert System.
- 10 Explain Perceptron learning.
- 11 What is declarative knowledge?
- 12 What are the properties needed for an Intelligent Agent?

**SECTION B**

Answer **ALL** questions.  
(Each question carries 9 marks)

[5 X 9 = 45]

- 13 (a) Explain in detail about some real-world applications of AI.

**[OR]**

- (b) Discuss and elaborate a logical based financial advisor using Predicate calculus?

- 14 (a) Discuss state space search graph with example? Explain Best First Search algorithm.

**[OR]**

- (b) Explain alpha beta pruning. Give suitable example.

- 15 (a) Explain the issues in Knowledge Representation.

**[OR]**

- (b) Write briefly about conceptual graph with suitable examples showing the difference of individual and generic marker.

P.T.O

'  
16

(a) Discuss the following.

- i) Planning in AI.
- ii) Abstract Data types in Prolog.

[OR]

'  
16 (b) Explain in detail about case based reasoning and model based reasoning.

'  
17

(a) Explain ID3 Decision Tree Induction algorithm?

[OR]

'  
17 (b) Discuss the following: -

'  
17 i) Genetic Algorithm.

'  
17 ii) Back propagation algorithm.

**Rajagiri College of Social Sciences (Autonomous)  
Continuous Assessment Examination - II**

**April 2022  
II MCA 205**

**Code: MCA205**

**Sub: Artificial intelligence**

**Total Time : 1 hr.**

**Total Weightage : 16**

**SECTION A**

*Each question has a weightage of 4*

1. Construct a Copycat problem solving architecture in AI? – (Embedded Question – Compulsory)
2. Mention the conceptual dependencies syntax rules? Write the Conceptual dependency representation of the sentence “Yesterday John hit his little dog”?

**OR**

3. Explain in detail about the roles and components of an expert system?

**SECTION B**

*Each question has a weightage of 4*

4. Explain ADT Stack in detail with a suitable example? – (Embedded Question – Compulsory)
5. Describe Recursion in PROLOG?

**OR**

6. Explain in detail about blackboard architecture?

**Rajagiri College of Social Sciences (Autonomous)**  
**Continuous Assessment Examination - II**  
**March 2023**  
**II MCA**

**Code: MCA205**

**Total Time : 90 minutes**

**Sub: Artificial Intelligence**

**Total Marks : 40**

Level	Blooms Taxonomy Levels of Learning
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Evaluating
L6	Creating

**SECTION A**

*Each Question has 10 marks*

Sl.no	Question	CO Mapped	Bloom's Taxonomy level
✓1	<p>What is semantic network? Illustrate the semantic network representation of the following information.</p> <ul style="list-style-type: none"> <li>• Tom is an instance of dog.</li> <li>• Tom caught a cat</li> <li>• Tom is owned by roshan.</li> <li>• Tom is brown in colour.</li> <li>• Dogs like bones.</li> <li>• The dog sat on the mat.</li> <li>• A dog is a mammal.</li> <li>• A cat is an instance animal</li> <li>• All mammals are animals.</li> <li>• Mammals have fur.</li> </ul> <p style="text-align: right;">- Embedded Question</p>	MCA205.3	L2
2	Write short note on conflict resolution.		

**OR**

✗ 3 Detail any five advantages of a production system for AI

**SECTION B**  
*Each Question has 10 marks*

<i>✓</i> 4	Illustrate the working of a Rule based Expert system with a suitable example. - Embedded Question	MCA205.4	L4
<i>✓</i> 5	With a neat diagram explain the architecture of Expert system.		
<b>OR</b>			
6	Compare monotonic and non-monotonic reasoning.		