



ID NO.	
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PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 40 %

Max Marks: 80

Max Time: 2 hrs.

07 May 2018, Monday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18 Course: **CSE 222 Artificial Intelligence**

VI Sem. CSE

Instructions:

- (i) *Read the question properly and answer accordingly.*
 - (ii) *Question paper consists of 3 parts.*
 - (iii) *Scientific and Non-programmable calculators are permitted*
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Part A

(4 Q x 6 M = 24 Marks)

1. Convert the following in to Propositional Logic:

i) If 7 is a prime number, then 7 does not divide 35.

ii) The contract is satisfied if and only if the building is completed by November 30.

2. Convert the following in to Predicate Logic:

i) Some people who trust others are rewarded.

ii) If anyone is good then John is good.

3. Express the following concepts as an associative network structure with interconnected nodes and arcs.

State university system is an institute of higher learning. State university system follows budget of state policies. University of Austin and University of El Paso belongs to state university system. University of El Paso contains college of engineering and college of science. College of engineering has Electrical and Computer Science departments. Computer Science department is in engineering building. Amit is a professor in Computer Science department. He married to Akshata. He owns house. He drives Buick.

4. Construct "AND" gate using Artificial Neural Network.

Part B

(4 Q x 9 M = 36 Marks)

5. Answer the query, using technique of resolution by refutation:

Anyone passing his history exams and winning the lottery is happy. But anyone who studies or is lucky can pass all his exams. John did not study but he is lucky. Anyone who is lucky wins the lottery. Is John happy?

6. Answer the query, using the Backward Rule Deduction system by drawing full AND/OR graph:

Facts:

1. John Jones is the manager of the purchasing department.
2. Joe Smith works in the purchasing department.
3. Sally Jones works in the purchasing department.
4. Pete Swanson works in the purchasing department.
5. Harry Turner is the manager of the sales department.
6. Mary Jones works in sales department.
7. Bill White works in sales department.
8. John Jones married to Mary Jones.

Rules:

1. If person y is a manager of the department x, implies person y works in department x.
2. If person y works in department x and z is the manager of department x then z is the boss of y.
3. Company policy does not allow married couple to work in the same department.
4. Marriage is symmetrical.
5. All married employees of the purchasing department are insured by the Eagle Corporation.

Query: Name someone insured by the Eagle Corporation.

7. Describe supervised and unsupervised learning.
8. The full joint probabilities for rain and wind are given in the following table.

	No wind	Little wind	Strong wind	Storm
No rain	0.1	0.05	0.2	0.01
Light rain	0.05	0.1	0.15	0.04
Heavy rain	0.05	0.1	0.1	0.05

What is the marginal probability of i) no rain ii) Light rain iii) Heavy rain and iv) No wind ?

Part C

(2 Q x 10 M = 20 Marks)

9. Derive a parse tree for the sentence “Bill loves the frog” where the following rewrite rules are used.

$S \rightarrow NP VP$

$NP \rightarrow N$

$NP \rightarrow DET N$

$VP \rightarrow V NP$

$DET \rightarrow the$

$V \rightarrow loves$

$N \rightarrow bill | frog$

Draw an ATN to implement the above grammar.

10. Draw the decision tree for given data-set. Show calculations for Entropy and Gain in each level of the decision tree.

Outlook	Humidity	Wind	Play Cricket
Sunny	High	Weak	No
Sunny	High	Strong	No
Overcast	High	Weak	Yes
Rain	High	Weak	Yes
Rain	Normal	Weak	Yes
Rain	Normal	Strong	No
Overcast	Normal	Strong	Yes
Sunny	High	Weak	No
Sunny	Normal	Weak	Yes
Rain	Normal	Weak	Yes
Sunny	Normal	Strong	Yes
Overcast	High	Strong	Yes
Overcast	Normal	Weak	Yes
Rain	High	Strong	No



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Max Time: 1 hr.

29 March Thursday 2018

TEST – 2

SET B

Even Semester 2017-18 Course: **CSE 222 Artificial Intelligence**

VI Sem. CSE

Instruction:

- (i) Read the question properly and answer accordingly.
 - (ii) Scientific and Non-programmable calculators are permitted
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Part A

(5 Q x 4 M = 20 Marks)

1. Express the following concepts as an associative network structure with interconnected nodes and labeled arcs.

Company INFOTECH is a software development company. Three departments within the company are Sales, Administration and Programming. John is the manager of Programming. Suresh and Shruthi are programmers. Shruthi is married to Sameer. Sameer is an editor for Prentice Hall. They have 3 children, and they live on Church Street. Shruthi wears glasses and is six feet three inches tall.

2. Draw conceptual graph for the below statement

“John is travelling by bike on NH4 highway.”

3. Join conceptual graphs for the below statements.

“Her name is Mary. She calls herself as Lil. But everyone knew her as Nancy.”

4. Give the frame structure for the Person with below details.

Ramesh is the professor. His age is 45. His wife is Reena. His children’s name are sue and joe. He stays in Church Street, Bengaluru, Karnataka, 560001.

5. Answer using resolution by refutation:

Mary had a little lamb.

Little lamb goes wherever Mary goes.

Mary is at church.

Where is little lamb?

Part B

(1 Q x 8 M = 8 Marks)

6. What is TMS? Describe any two types of Truth Maintenance System.

Part C

(1Q x 12 M = 12 Marks)

7. Answer the query, using the Backward Rule Deduction system by drawing full AND/OR graph:

Facts:

F1: Fido is a dog.

F2: Fido doesn't barks.

F3: Fido wags tail.

F4: Myrtle meows.

Rules:

R1: If x wags tail and x is a dog then x is friendly.

R2: If y is friendly and y doesn't bark then z is afraid of y.

R3: If w is dog then w is animal.

R4: If p is cat then p is animal.

R5: If q meows then q is cat.

Query: Is there a cat and a dog such that the cat is unafraid of the dog?



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24 Feb Saturday 2018

TEST – 1

Even Semester 2017-18 Course: **CSE 222 Artificial Intelligence**

VI Sem. CSE

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Scientific and Non-programmable calculators are permitted

Part A

(6 Q x 4 M = 24 Marks)

1. Define Knowledge, hypothesis and belief.
2. How one able to classify the predicate logic as first order or higher order?
3. Convert the following in to Propositional logic
"You cannot ride the roller-coaster if you are 4 feet tall unless your age is 16 and above."
4. Prove that $p \wedge q \rightarrow p \vee q$ is a tautology.
5. Convert the following in to predicate logic:
"All lions are fierce." "Some lions do not drink coffee." "Some fierce creatures do not drink coffee."
6. Verify the Validity of the following argument:
"All men are mortal." "Socrates is a man." "Therefore Socrates is a mortal."

Part B

(1 Q x 6 M = 6 Marks)

7. What are the components of knowledge based system? Explain with a neat diagram.

Part C

(1Q x 10 M = 10 Marks)

8. Answer the query, using the technique of resolution by refutation:
Suresh Rania, M.S. Dohni and Raghul are members of the team CSK. Every member of CSK plays football or Tennis or both. No football player likes coffee and all Tennis players like Tea. Raghul dislikes whatever Suresh Rania likes and likes whatever Suresh Rania dislikes. Suresh Rania likes coffee and Tea. Is there a member of CSK who is a football player but not tennis player?