PURBANCHAL UNIVERSITY

2024

Bachelor in Information Technology (B.I.T.)/Sixth Semester/Final

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT354CO: Simulation & Modeling *(New Course)*

Candidates are required to give their answers in their own words as far as practicable. Figure in the margin indicate full marks.

Group A

2×12=24

Answer TWO questions.

1. What are the distinct phases of a comprehensive simulation study? Explain the tasks that each phase encompasses.
2. What are the properties of random number? The sequence of numbers 0.54, 0.73, 0.98, 0.11 and 0.68 has been generated. Use the Kolmogorov-Smirnov test $\alpha=0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval 0 to 1 can be rejected.
   (Note that the critical value of D for $\alpha=0.05$ and $N=5$ is 0.565)

3(a) Explain about Kendal's notation with an example.

(b) Write down the applications of real-time simulation.

Group B

7×8=56

Answer SEVEN questions.

4. Discuss about the limitations or challenges of using simulation languages for modeling complex systems.
5. What are continuous and discrete systems, and what types of systems do they represent? Give examples.
6. What do you mean by Poker test? Write the significance of testing numbers for randomness in statistical analysis.
7. What is a queuing system and what are the key components involved?
8. Describe Monte Carlo simulation and state the scenarios of using Monte Carlo method over other simulation methods.
9. Define and describe Markov chain with example.
10. What are the different estimation methods used in analyzing simulation output? Elaborate on the process of estimating internal bias in simulation.
11. List any five circumstances when the simulation is appropriate tool and when it is not.
12. Write short notes on: 2×4=8
    (a) Hybrid simulation
    (b) Use of partial differential equation in simulation model

PURBANCHAL UNIVERSITY
2024

Bachelor in Information Technology (B.I.T.)/Sixth Semester

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT371CO/BIT323CS: Data Mining & Data Warehousing *(Back/Old)*

Candidates are required to give their answers in their own words as far as practicable. Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is association analysis? Explain with example. List down the problems in data mining. 8+4
2. Explain the different phases of knowledge discovery in database.
3. Explain three-tier data warehouse architecture with appropriate diagram. Differentiate between OLAP and OLTP. 8+4

Group B

Answer SEVEN questions. **7×8=56**

4. What is data mining? List down the applications of data mining.
5. Define multimedia data mining, text mining and web mining with examples.
6. Briefly discuss tuning and testing the data warehouse.
7. Briefly explain different query tools used in data mining.
8. Define genetic algorithm with its various phases.
9. What do you mean by market basket analysis? How does it help in data mining tasks?
10. Explain various data mining techniques.
11. Find the distance between following two data points using Euclidean distance measure.

	Income ($)	Credit ($)	Age (Years)
Client1	4000	40000	40
Client2	8000	60000	20

12. Write short note on any TWO: 2×4=8

(a) Database and data mart (b) Social impact of data mining

(c) Star schema and snowflake schema

PURBANCHAL UNIVERSITY

2021

Bachelor in Information Technology (B.I.T.)/Sixth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT371CO: Data Mining & Data Warehousing *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is data mining? Explain KDD process with diagram in detail. 2+10

2(a) Explain the use and benefits of data warehousing. 4

(b) A data warehouse is a subject oriented, integrated, time variant, non-volatile collection of data support of the management's decision making process. Explain each term used with their relevant meaning with respect to data warehouse. 8

3. What is association rule? Explain Apriori algorithm with example. 3+9

Group B

Answer SEVEN questions. **7×8=56**

4. Describe Data mining Architecture with proper diagram.
5. What is snow-flake schema? Compare it with fact constellation.
6. Explain the importance of Data mining in E-Commerce and Marketing.
7. Define Web mining and its types.
8. What Is OLAP? Explain the difference between OLTP and OLAP.
9. Discuss the operations on Multidimensional Cube structure.
10. Define data extraction and data transformation in warehouse technology.

Contd. ...

11. Find the distance between following two data points u
Euclidean distance measure.

	Income ($)	Credit ($)	Age (yrs)
Client 1	5000	50,000	40
Client 2	7000	70,000	50

12. Write short notes on any TWO:
(a) Back propagation
(b) Agglomerative and Divisive
(c) Client Server and data warehousing

PURBANCHAL UNIVERSITY
2017

Bachelor in Information Technology (B.I.T.)/Sixth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT371CO: Data Mining & Data Warehousing *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What do you mean by data mining? Write the application of data mining and explain about KDD process with diagram.
2. What is data warehouse? Explain with a diagram. Why OLAP is used in multidimensional data models?
3. Why Cluster technique is used in data mining? Explain about partitioning method with example.

Group B

Answer SEVEN questions. **7×8=56**

4. What is the difference between data warehouse and database? Explain with example.
5. What is star schema? Why star schema is used in data warehouse? Explain with example.
6. What is query manager? Mention the operations that the architecture of warehouse manager performs.
7. What is web mining? Explain the types of web mining with an example.
8. Describe the importance of data mining in marketing, E-commerce and CRM.
9. What is regression analysis? Describe linear regression with an example.
10. Explain data mining process and also explain models of data mining in brief.

Contd. ...

PURBANCHAL UNIVERSITY

2016

Bachelor in Information Technology (B.I.T.)/Sixth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT371CO: Data Mining & Data Warehousing *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. A dada warehouse is a subject oriented, integrated, time variant, nonvolatile collection of data in support of the management's decision-making process." Explain each term used with their relevant meaning with respect to data warehouse.

2. What is Apriori Algorithm? Find the frequent items bought together using Apriori Algorithm of the following transactions.

Transaction ID	Items Bought
T1	{Mango, Onion, Nintendo, Key-chain, Eggs, Yo-yo}
T2	{Doll, Onion, Nintendo, Key-chain, Eggs, Yo-yo}
13	{Mango, Apple, Key-chain, Eggs}
T4	{Mango, Umbrella, Corn, Key-chain, Yo-yo}
T5	{Corn, Onion, Onion, Key-chain, Ice-cream, Eggs

3(a) What do you mean by Euclidian distance? Find the distance between the two Data points. 6

	Age	Yearly Income	Bank Balance
Data Point 1	85	80345	8450
Data Point 2	53	60876	5890

(b) Explain star schema in brief. 6

Group B

Answer SEVEN questions. **7×8=56**

4. What is clustering? Explain K-mean method with example.

5. Discuss different types of OLAP servers in brief.

Contd. ...

6. Explain the terms data selection, cleaning, enrichment, coding and mining in KDD Environment.

7. How can we achieve the security and privacy in data mining?

8. Explain the Three-Tier Data Warehouse Architecture with a diagram.

9. What is web mining? What are the types of web mining? Explain in brief.

10. Define OLAP. Explain the Extract, Transform and load (ETL) process with a diagram.

11. Write short notes on any TWO:
    (a) Benefits and application of data mining
    (b) Problem in data warehousing
    (c) Fact table

PURBANCHAL UNIVERSITY
2015

Bachelor in Information Technology (B.I.T.)/Sixth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT371CO: Data Mining & Data Warehousing *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What do you mean by data mining? Describe the KDD process in detail with a neat diagram. 12

2. What do you mean by cluttering? What are the types of clustering? Explain any two clustering methods in detail. 12

3. What is data warehouse? Explain with its architecture. What is the difference between data warehouse and database? 12

Group B

Answer SEVEN questions. **7×8=56**

4. Explain the importance of data mining in Human Resource Management (HRM) and sales promotion. 8

5. What is data warehousing? Explain the application of data mining.

6. What is snow-flake schema? How relations are related in show-flake schema? Explain with example. 8

7. Compare and contrast between OLAP and OLTP. 8

8. What do you mean by multimedia data mining? Explain the difference between web content mining and web usage mining. 8

9. Explain Apriori algorithm. 8

10. Find the distance between following two data points using Euclidean distance measure: 8

	Income	Credit($)	Age (yrs)
Client1	$4000	$30,000	30
Client2	$7000	$40,000	40

Contd. ...

PURBANCHAL UNIVERSITY

2014

Bachelor in Information Technology (B.I.T.)/Sixth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT323CS: Data Mining & Data Warehousing

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is association analysis? Give one algorithm and explain with example.
2. Describe the knowledge discovery process in detail with a neat diagram.
3. What is Data Mining and descriptive Data Mining? Write down its characteristics.

Group B

Answer SEVEN questions. **7×8=56**

4. What is Data Warehousing? Explain the application of data mining.
5. Explain the different aspects of security and privacy in Data Mining.
6. Describe Data Mining process and also explain models of Data Mining in brief.
7. What is Hierarchical clustering? Give any other clustering techniques.
8. Explain the relationship between operational data, adata warehouse and data mart.
9. Discuss the importance of data mining in multimedia and marketing.
10. What is query manager? Mention the operations that the architecture of warehouse manager perform.
11. Notes any TWO:
    (a) OLAP tools
    (b) System testing
    (c) Client Server and data warehousing

PURBANCHAL UNIVERSITY
2022

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*
Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32
BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) Devise an example to show how A* algorithm uses path cost and heuristic cost to generate best solution. 5

(b) What is an agent? State all agent environments with suitable example. 1+6

2(a) State inference theorems, with suitable examples. 5

(b) What are the problems of Mm-Max search? Explain alpha-beta pruning algorithm. 3+4

3(a) Is it possible to make a computer that think like human brain? Justify with proper reason. What is the purpose of Turing test? Describe it in detail. 2+3

(b) Explain Breadth first search and Depth first search algorithm. Also list out their limitations. 4+3

Group B

Answer SEVEN questions. **7×8=56**

4. Define propositional logic. Convert the following sentences into FOPL. 2+6

(a) Anyone passing the exam and winning the lottery is happy.

(b) Anyone who is lucky wins the lottery.

(c) Ram didn't study well but he is happy.

(d) Only healthy people can run fast.

Contd. ...

5. What is the difference between machine learning and deep learning? Explain multilayer neural network with suitable example. 4+4

6. Define constraint satisfaction problem (CSP). Stating necessary conditions and assumptions, solve the following crypto arithmetic problem. 2+6

SEND + MORE = MONEY

7. Why reasoning is important in AI? Explain case based reasoning with example. 2+6

8. What is the importance of Natural Language Understanding and Generation? Explain all the steps involved in NLP. 3+5

9. What is semantic network and what is its significance? Represent the following sentences in semantic network. 4+4

(a) Birds are animals.

(b) Birds have feathers, fly and lay eggs.

(c) Albatross is a bird.

(d) Donald is a bird.

(e) Tracy is an Albatross.

10. What is the importance of knowledge acquisition in expert system? Explain all the components involved in expert system. 2+6

11. Write short notes on any TWO: 4+4

(a) PEAS

(b) Reinforcement learning

(c) Forward chaining vs backward chaining

PURBANCHAL UNIVERSITY

2021

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Finial*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. Define artificial Intelligence. Explain various application of Artificial intelligence in real field. What are the challenges of Artificial Intelligence? 2+6+4

2. What are Expert systems? With a neat diagram of an expert system, explain the necessary steps to develop it. 3+9

3. What is searching? What are its types? Explain depth-limited search and iterative deepening search with their pros and cons. 2+2+8

Group B

Answer SEVEN questions. **7×8=56**

4. What are agents in Artificial Intelligence? State and explain any two types of agents with necessary diagram. 2+6

5. What is means-ends analysis? Compare forward chaining and backward chaining. 2+6

6. What is learning? Explain supervised vs unsupervised learning. 2+6

7. Solve the following crypto-arithmetic problem, where different letter denote different integer and identical letters denote same integer.

   OUR+AIM=GAME

   Show all the steps you advance through constraint satisfaction.

Contd. ...

8. Discuss different steps in Natural Language Processing? Construct a parse tree for the following sentence. 5+3

   "The man shot an elephant"

9. Express the following into first order predicate logic (FOPL).
   (a) All the existing kinds of birds can fly
   (b) Every student smiles.
   (c) Everyone loves himself.
   (d) Not all people have a cell phone.

10. Define artificial neural network with its components. Explain how artificial neural network learns. 2+6

11. Write short notes on any TWO: 4+4
    (a) Genetic Algorithm
    (b) PEAS
    (c) Best-first search

PURBANCHAL UNIVERSITY
2019

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is constraint satisfaction Problem? Solve the following crypto-arithmetic problem where different letter denote different integers and identical letter denote same integer. State all the assumptions you make and show all the steps how you advance through constraint satisfaction Problem. 2+10

PLAYS+WELL=BETTER

2(a) Define Knowledge representation and Knowledge acquisition. Differentiate between procedural and declarative knowledge. 2+4

(b) Consider the knowledge base given as: KB= $(B \leftrightarrow (A \vee C)) \wedge \neg B$. Prove that $\neg A$ can be inferred from above KB by using Resolution. 6

3(a) Explain the steps of Natural Language Processing. 6

(b) Why Machine learning is required? Explain in brief about Learning by analogy. 2+4

Group B

Answer SEVEN questions. **7×8=56**

4. Differentiate between intelligent computing and conventional computing. What is the purpose of Turing test? 5+3

5. Describe the salient features of an agent? Explain goal based agent with Example. 3+5

6. What do you mean by Blind search? Explain in detail about A* search with example. 2+6

7. Explain propositional logic vs predicate logic with example. 8

8. List the characteristics of Hopfield Network. Explain how it works. 2+6

9. Explain network structure of ANN. 8

10. Why Game playing is required in AI? Formulate the problem formulation for 8 Queen Problem. 8

11. What is Semantic Network? Explain with example. 8

12. Write short notes on any TWO: 4+4
    (a) Depth-limited search
    (b) Genetic algorithm
    (c) Monotonic and non-monotonic reasoning

PURBANCHAL UNIVERSITY
2018

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is searching? What are its types? Explain any two informed search techniques with suitable example. (8) 2+2+8

2. What is natural language processing? Discuss different steps in natural language processing. 3+9

3. What are agents in AI? State and explain any two types of agents with suitable example and diagram. (7) 3+9

Group B

Answer SEVEN questions. **7×8=56**

4. What is AI? Explain various application of AI in real field. (5) 2+6

5. What is learning? Explain explanation based learning. (4) 2+6

6. Solve the following crypto-arithmetic problem, where different letter denote different integer and identical letters denote same integer SEND+MORE=MONEY. Show all steps how you advance through Constraint Satisfaction. (4) 8

7. What are the problem of Min-Max searching in game playing and how **alpha-beta** pruning technique is used to optimize it? Explain with example 8

8. Express the followings in to first order predicate logic (FOPL). 8

   (a) John likes all kind of food.
   (b) Apple and chicken are foods.
   (c) Anything anyone eats and isn't killed by is food.
   (d) Sue eats everything that Bill eats.
   (e) Bill eats peanuts and is still alive.

Use resolution to answer the question "does John like peanuts?

9. What is a back propagation? Explain all the steps involved in the back propagation with suitable examples. 2+6

10. What is expert system? Explain application and development of expert system. 2+6

11. Write short notes on any TWO: 4+4
    (a) Bayesian network
    (b) Game playing
    (c) Genetic algorithm

PURBANCHAL UNIVERSITY

2017

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What are Expert Systems? With a neat diagram of an expert system, explain the necessary steps to develop it. 3+9

2. State inference theorems with relevant examples. Describe Bayesian network. 8+4

3. Convert the following sentences into FOPL: 6×2=12
   (a) All people who are not poor and are smart are happy.
   (b) Those people who read are not stupid.
   (c) Nobody likes taxes.
   (d) Anyone who is lucky wins the lottery.
   (e) There are some people who exercise.
   (f) Only healthy people can run fast.

Group B

Answer SEVEN questions. **7×8=56**

4. Explain the types of agent environment.

5. What is means-ends analysis? Compare forward chaining and backward chaining.

6. Explain the semantic net with example. Why is frame system required?

7. Discuss learning by analogy with example. Explain supervised vs unsupervised learning.

Contd. ...

8. What are the steps in NLP? Construct a parse tree for the following sentence:
"The train passed the station in the early morning."

9. What is depth-limited search? Explain A* search algorithm.

10. What are the challenges of AI? Discuss any two application areas of AI.

11. Write short notes on any TWO:
(a) Back Propagation
(b) MYCIN
(c) Game playing

PURBANCHAL UNIVERSITY
2017

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT472CO: Artificial Intelligence *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is searching? What are its types? Explain in detail about any two informed search techniques with suitable example.

2. Explain how brain works. What is Neural Network? How does it differ from Expert System?

3. State and explain the types of agents. Can we build an intelligent agent without learning element? Justify your answer.

Group B

Answer SEVEN questions. **7×8=56**

4. Explain about semantic network and frames with suitable examples.

5. Define an expert system. Differentiate between forward and backward chaining.

6. Solve the following crypto-arithmetic problem, where different letter denote different integer and identical letters denote same integer SEND+MORE=MONEY. Show all steps how you advance through Constraint Satisfaction.

7. Define genetic algorithm. Explain different steps of genetic algorithm in brief.

8. Define a multi layer neural network. Explain back propagation algorithm for training the multilayer neural network along with an example.

9. Differentiate natural language processing (NLP) with machine translation (MT). How does parse tree help in NLP, explain with suitable example.

10. What are the problem of Min-Max searching in game playing and how alpha-beta pruning technique is used to optimize it?

11. What is Al? How is it different from natural intelligence? Support with example

12. Write short notes on any TWO:

    (a) MYCIN
    (b) Production Rules system
    (c) Hopfield Network

2016

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT415CS: Artificial Intelligence

as practicable.

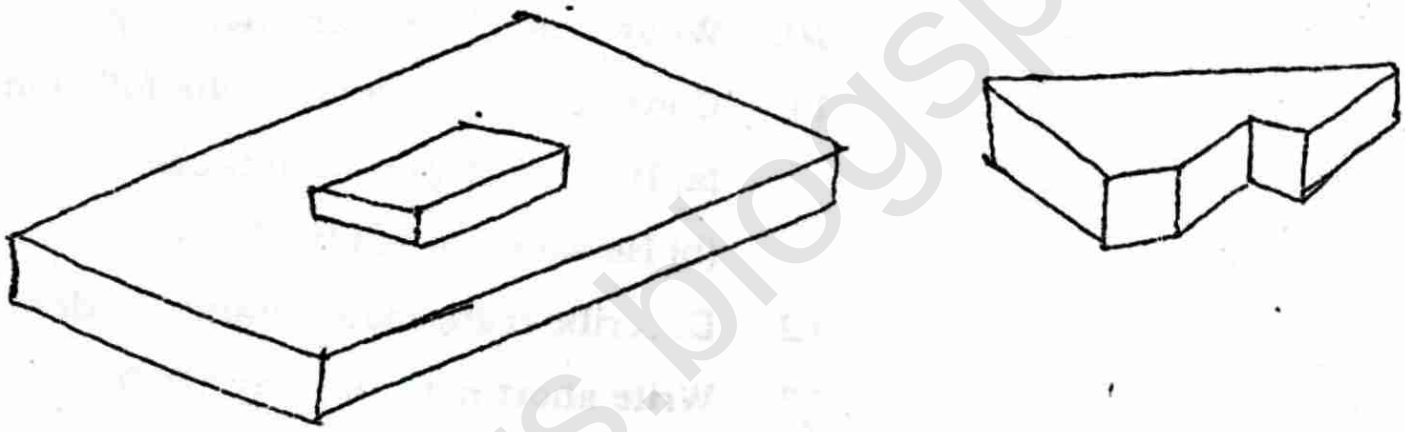
Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) What is line labeling? Discuss. 6

(b) Correctly label each line of the given drawings. 3+3



2. What is knowledge acquisition? Briefly describe the various methods of knowledge acquisition used in artificial intelligence. 2+10

3. Define artificial neural network with its components. Explain how the artificial neural network learns. 4+8

Group B

Answer SEVEN questions. **7×8=56**

4. Illustrate forward chaining with your own example. How does it differ from backward chaining? 4+4

5. Define artificial intelligence. List major disadvantages of artificial intelligence over natural intelligence. 2+6

6. What is propositional logic? Express following into propositional logic:

   (i) If I get upset, I either cry or go to a restaurant and spend few hours there.

   (ii) If you are intelligent and powerful then you will lead the nation but you will gain enemies. 2+3

7. Describe knowledge representation using frames. Give a suitable example. 5+3

8. What do you mean by Bayesian networks? Describe. 8

9. Represent the following sentences in predicate logic: 4+4

   (a) Everyone is loyal to someone.

   (b) All parents have either male or female (or both) children.

10. What is machine learning? Explain genetic algorithm. 3+5

11. Construct Parse-tree for the following sentences: 4+4

   (a) Himesh slept on the table

   (b) He wants to study abroad

12. Describe truth maintenance in detail. 8

13. Write short notes on any TWO: 4+4

   (a) Adaline

   (b) Heuristic search

   (c) Expert system development

PURBANCHAL UNIVERSITY

2014

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Chance*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT415CS: Artificial Intelligence

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What do you mean by ANN? Describe the multilayer feed forward neural network with back propagation algorithm.

2. What is blind search? Describe the working principle of depth first search. Compare depth first search with breadth first search by mentioning performance measure factor and critical case.

3(a) Describe the syntax and semantics of first order logic with Backus Naur form.

(b) Convert the following sentence into FOPL

A1: If x is on top of y, y supports x.

A2: If x is above y and they are touching each other, x is on top of y.

A3: A cup is above a book.

A4: A cup is touching a book.

Show that the predicate supports (book, cup) are true using resolution.

Group B

Answer SEVEN questions. **7×8=56**

4. What is turing test? Explain in detail.

5. What is NLP? Parse the following sentence.
I am in the left side of the river.

Contd. ...

6. Explain the components of the knowledge based expert system .Also list the advantage of expert system.

7. Solve the following crypt-arithmetic puzzle.

   SEND
   MORE
   MONEY

8. What do you understand by Min-Max search? Explain with example.

9. What is CNF? Convert the following expression in to CNF.

10. What is the difference between supervised and unsupervised learning? Explain with example.

11 What do you mean by well define problem? Explain in detail.

PURBANCHAL UNIVERSITY

2012

Bachelor in Information Technology (B.I.T.)/Seventh Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT415CS: Artificial Intelligence

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A:

Answer TWO questions. **2×12=24**

1. Solve the following crypt arithmetic puzzle where different letters denote different integers. State all the assumptions you make and show all the steps how you advance through constraint satisfaction.

```
  LONG
+ LIVE
------
 NEPAL
```

2(a) What is an expert system? Discuss its advantages. 6

(b) What is a semantic net? Explain the significance of frame systems. 6

3(a) Define machine learning. What are its types? Explain any two learning methods. 8

(b) What is back propagation? Explain. 4

Group B:

Answer SEVEN questions. **7×8=56**

4. Convert the following English sentences into FOPL: 4×2=8

(a) Farmers like raining

(b) All snakes are poisonous

(c) Students either study regular or during exam

(d) Everyone saves money.

5. What is knowledge acquisition? Explain knowledge elicitation techniques. 2+6

6. Discuss means-end analysis. Also explain MYCIN system and its applications. 3+5

7. Define natural language processing. Construct a parse tree for the following sentence. 2+6

"Tim goes for morning walk every morning".

8. What is reasoning? How does Bayesian network deal with uncertainty? Explain. 2+6

9. Define Hopfield network and its characteristics. Explain how it works. 4+4

10. What is best-first search? Why is it considered as a heuristic search? Explain. 4+4

11. Write short notes on any TWO: 2×4=8
(a) Reference rule
(b) Genetic algorithm
(c) Intelligent agent

PURBANCHAL UNIVERSITY

2009

Bachelor in Information Technology (B.I.T.)/Seventh Semester/Final

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT415CS: Artificial Intelligence

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A: Long-answer Questions

Answer TWO questions. 2×12=24

1(a) What are the different types of agent programs? Explain each of them with examples. 8

(b) Differentiate between DFS and BFS. 4

2(a) Explain how knowledge is acquired and represented in AI. 7

(b) Discuss why planning is required for problem-solving in AI. 5

3. Transform the following sentences in predicate calculus: 5+3+4

(a) All students only like easy courses.

(b) Science courses are hard.

(c) All the courses in university are easy.

(d) BIT is a university course.

(e) All students are enrolled in university.

Convert each of them in clausal form, making assumptions as needed. Using resolution, prove that "All students are BIT student".

Group B: Short-answer Questions

Answer SEVEN questions. 7×8=56

4. Define reasoning. What are the methods of reasoning that deal with uncertainty? Explain.

5. How does a Boltzmann machine try to solve the problems of Hopfield networks? Explain.

6. What is an expert system? Describe the application areas of an expert system.

Contd. ...

7. Explain the working of genetic algorithm with example.

8. Mention the different learning methods. Discuss explanation based learning with example.

9. What is a neural network? What are its characteristics? Explain with a well-sketched diagram.

10. What do you mean by game playing? Why games are considered to be an efficient domain for exploring machine intelligence? Give reasons.

11. Write short notes on any TWO:
    (a) Back Propagation
    (b) Machine Vision
    (c) NLP