University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELLOR OF SCIENCE IN COMPUTER SECURITY AND FORENSICS

CCS 3350/3303: ARTIFICIAL INTELLIGENCE

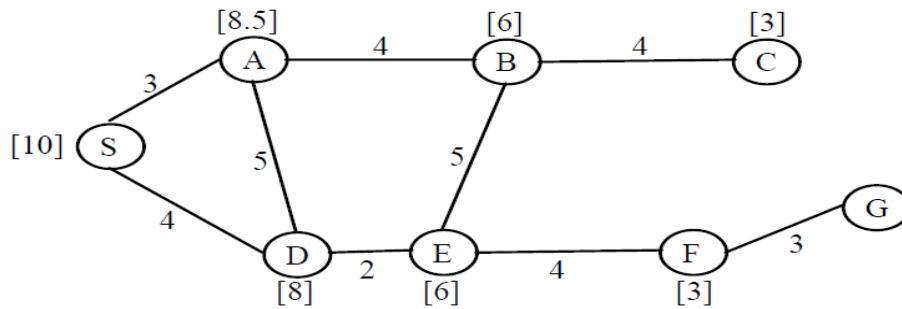**DATE: JANUARY 2025** | **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **ONE** (Compulsory) and any other **TWO** questions*

QUESTION ONE (30 MARKS)

a) Write the following proposition into First Order Logic (6 Marks)

   i.   All men are person

   ii. Tom is tall

   iii. All cows eat grass

b) Discuss the following Knowledge Representation schemes (4 Marks)

   i.   Production Rules

   ii. Frames

c) Identify any five areas of Artificial intelligence (5 Marks)

d) Differentiate between Forward Chaining and backward chaining in AI (4 Marks)

e) Identify five ways which Intelligent agents differ with other software (5 Marks)

f) Using a suitable Diagram discuss the components of an expert system (6 Marks)

QUESTION TWO (20 MARKS)

   a) Use A* Algorithm to find the path from City S to City G using the following Information (7 Marks)

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b) Use the statements below to draw a suitable semantic network as used in knowledge representation

(5 Marks)

    i.   Jerry is a cat.

    ii.   Jerry is a mammal

    iii.   Jerry is owned by Priya.

    iv.   Jerry is brown colored.

    v.   All Mammals are animal.

c) Discuss the following Generative AI Models   (6 Marks)

    i.   Generative Adversarial Networks (GANs)

    ii.   Variational Autoencoders (VAEs

    iii.   Transformers

d) Define the term Search as used I Artificial intelligence   (2 Marks)

QUESTION THREE (20 MARKS)

a) Discuss FOUR ways on how you can evaluate a search   (4marks)

b) Define the following terms as used in AI search problem   (6 Marks)

    i.   State space

    ii.   Start node

    iii.   Goal condition

c) Identify any four examples of generative tools   (4 Marks)

d) Discuss machine learning life cycle   (6 Marks)

QUESTION FOUR (20 MARKS)

a) Using a suitable show how simple reflex agent interact with the environment   (5 marks)

b) Discuss any five Things a computer needs to pass the Turing Test (5 Marks)

c) Discuss any three Agent environment (6 Marks)

d) Write a prolog program that displays Hello world on the screen (4 marks)

QUESTION FIVE (20 MARKS)

a) Discuss the following machine learning techniques (6 Marks)

i. supervised,

ii. unsupervised

iii. reinforcement learning.

b) Artificial intelligence is a multi-disciplinary domain, discuss any five areas that contribute to Artificial intelligence (5 Marks)

c) Discuss any five application areas of Artificial Intelligence (5 marks)

d) Artificial Intelligence (AI) is a broad field that encompasses various subfields and approaches. Discuss the following Types of Artificial Intelligence (4 marks)

i. Narrow or Weak AI

ii. Super AI