**(2 ½ Hours)**   **[Total Marks: 75]**

N.B.   1) **All questions are compulsory.**
2) **Figures to the right indicate marks.**
3) **Illustrations, in-depth answers and diagrams will be appreciated.**
4) **Mixing of sub-questions is not allowed.**

Q. 1   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   What is PEAS? Give a PEAS description for playing a tennis match and vacuum cleaner problem.
(b)   Define AI? Explain any 2 foundations of AI
(c)   Explain the 8-Queens Problem and write the States, Initial state, Actions, Transition Model, Goal state & Path cost to formulate it.
(d)   Explain Depth First Strategy along with pseudocode.
(e)   Write a short note on model based agent.
(f)   Find the optimal path & path cost for the following graph using A* search algorithm. (S is a Start state & G is a Goal State)
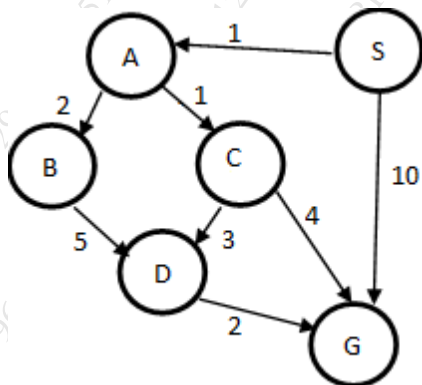
State	h(n)
S	5
A	3
B	4
C	2
D	6
G	0

Q. 2   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Describe knowledge representation. Explain frame representation technique of knowledge representation in detail.
(b)   Write a note on Multilayer Feed Forward Neural Network.
(c)   Explain the concept of Overfitting and Underfitting of model.
(d)   What is Regression? Explain Simple Linear Regression with example.
(e)   Define Ensemble Learning. Explain Boosting technique in detail.
(f)   Explain KNN classifier with example.

Q. 3   **Attempt <u>ANY FOUR</u> from the following:**   **(20M)**

(a)   Write a short note on Q learning.

(b)   Differentiate between reinforcement and unsupervised learning.

(c)   For the given transaction dataset-

TID	Items Bought
100	Bread, Cheese
200	Bread, Cheese, Juice
300	Bread, Milk
400	Cheese, Juice, Milk

Calculate the following :-
   i) Support(bread)   ii) Support(bread->milk)
   iii) Confidence(bread->cheese)   iv) Confidence(bread->milk)
   v) Lift(bread->cheese)

(d)   Explain Hidden Markov Model in detail.

(e)   What is Clustering? Explain with example.

(f)   Write a short note on association rule mining.

Q. 4   **Attempt <u>ANY FIVE</u> from the following:**   **(15M)**

(a)   Explain Turing Test Approach in AI.

(b)   Explain Deterministic vs Stochastic Task Environment with suitable example.

(c)   Write a note on Active Reinforcement learning.

(d)   Explain Bellman Equation in detail.

(e)   What is the role of Reasoning in AI?

(f)   Explain the concept of gradient descent.

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(2 ½ Hours)   **[Total Marks: 75]**

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3) **Illustrations, in-depth answers and diagrams will be appreciated.**
4) **Mixing of sub-questions is not allowed.**

Q. 1   Attempt ANY FOUR from the following: **(20M)**
(a)   What in an evidence custody form? What information does it contain?
(b)   Explain the various storage Formats for Digital Evidence?
(c)   Differentiate between public sector and Private sector investigations?
(d)   Explain the necessary requirements for data recovery workstations and software?
(e)   Write short note on Contingency Planning for Image acquisition?
(f)   How will you analyse memory dump of a running computer system using FTK tool?

Q. 2   Attempt ANY FOUR from the following: **(20M)**
(a)   What is the best way to determine the tools which you need for the digital investigation?
(b)   Explain the necessary guidelines of seizing digital evidence at the scene?
(c)   Describe how to collect evidence at private sector from incident scenes?
(d)   Write a short note on recovering graphics files?
(e)   Briefly explain copyright with graphics?
(f)   How to detect hidden information or files within digital images using steganhide steganography tool and examine hidden content?

Q. 3   Attempt ANY FOUR from the following: **(20M)**
(a)   Write short note on the network forensic?
(b)   What is the general procedure for given live acquisition?
(c)   Write a note on SIM card?
(d)   Explain email header analysis?
(e)   Explain the guidelines for report writing?
(f)   How will you use the wireshark tool for identifying the live network, capture packets, analyse capture packets?

Q. 5   Attempt ANY FIVE from the following: **(15M)**
(a)   Explain in detail advance forensic format?
(b)   Explain short note on bitstream copies
(c)   Explain types of data acquisition in detail?
(d)   Explain the importance of investigation report?
(e)   Explain acquisition procedures for mobile devices?
(f)   Explain the technologies where the 4G networks can be used?

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40181

(2 ½ Hours)   **[Total Marks: 75]**

N.B.   1) **All questions are compulsory.**

2) **Figures to the right indicate marks.**

3) **Illustrations, in-depth answers and diagrams will be appreciated.**

4) **Mixing of sub-questions is not allowed**.

Q. 1   Attempt <u>ANY FOUR</u> from the following: **(20M)**

(a)   Explain in detail the different 2D transformations.

(b)   Discuss the concept of Shader Models.

(c)   Explain in detail Dot or Scalar product with suitable example.

(d)   A point has coordinates in the x, y, z direction i.e., (5, 6, 7). The translation is done in the x-direction by 3 coordinate and y direction 3 coordinates and in the z- direction by 2 coordinates. Shift the object. Find coordinates of the new position.

(e)   Define Quaternion. Explain addition and subtraction of two Quaternions.

(f)   Explain in detail culling and clipping.

Q. 2   Attempt <u>ANY FOUR</u> from the following: **(20M)**

(a)   Explain game engine architecture.

(b)   Write a short note on multisampling theory.

(c)   Discuss the pygame.int() and pygame.display.set_caption() functions in pygame with example

(d)   Explain the significance of texture and resource formats in DirectX.

(e)   Discuss 2D and 3D game development with MordenGL.

(f)   Describe Resource processing and File system in game engine.

Q. 3   Attempt <u>ANY FOUR</u> from the following: **(20M)**

(a)   Explain the concept of sprites.

(b)   Define game engine strategies when working with unity.

(c)   How Rigid body components are essential for creating realistic physics simulation in unity? Explain?

(d)   Explain about scripting collision events in unity.

(e)   Describe the overview of animation in unity.

(f)   Explain unity software interface in detail.

Q. 4   Attempt <u>ANY FIVE</u> from the following: **(15M)**

(a)   How to calculate 2D areas.

(b)   Write a short note on depth buffering.

(c)   Define class in unity with example.

(d)   Describe the steps in perspective projection.

(e)   Write advantages and disadvantages of game engine.

(f)   Explain conditional statement in unity.

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(2 ½ Hours)   **[Total Marks: 75]**

N.B.   1) **All questions are compulsory.**

2) **Figures to the right indicate marks.**

3) **Illustrations, in-depth answers and diagrams will be appreciated.**

4) **Mixing of sub-questions is not allowed.**

Q. 1   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Define computer security. What are the objectives of computer security?
(b)   What is an active attack in security? State various types of active attacks.
(c)   Write a note on Steganography.
(d)   Encrypt the following message using Rail Fence Algorithm with key size = 4.
Plaintext = they are attacking from the north.
(e)   Explain Electronic Code Book(ECB) mode in cryptography.
(f)   Differentiate substitution and transposition techniques.

Q. 2   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Write a note on public key cryptosystem.
(b)   Describe X.509 certificate format.
(c)   Assume Alice and Bob wish to communicate secretly. Compute the shared
secret key using Diffie Hellman Key Exchange.
[Prime number $p = 7$, generator $g = 3$, Alice's private key = 2, Bob's private
key = 4]
(d)   How does HMAC algorithm work?
(e)   Discuss the concept of a digital signature. Explain its types.
(f)   Explain kerberos processing in detail.

Q. 3   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   What is a firewall? State and explain various types of firewall.
(b)   Explain the importance of web security.
(c)   What is S/MIME (Secure/Multipurpose Internet Mail Extensions)? Define its
key features.
(d)   Describe IP security architecture.
(e)   State and explain any 5 types of virus.
(f)   Write a note on honeypots.

Q. 4   Attempt <u>ANY FIVE</u> from the following: **(15M)**
(a)   Define terms :
   i.   Cryptanalysis
   ii.   Brute Force Attack
(b)   What is message authentication code?
(c)   State any two common forms of malicious code.
(d)   Using Caesar cipher with key size = 3, encrypt the message "hide the gold and
defend east wall"
(e)   What are the three properties of Hash function?
(f)   Explain the life cycle of viruses.

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40170

(2 ½ Hours)   **[Total Marks: 75]**

N.B.   1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Explain about project management process.
(b)   Write a short note on stakeholder analysis.
(c)   Explain about project cost management process
(d)   Write a short note on earned value management.
(e)   Project X HAS a budget at completion of $50,000. After one month of work
the project manager assess the progress and determine that 30% of work has
been completed. Calculate the earned value.
(f)   What is control schedule? Explain its output.

Q. 2   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   What is relationship building? Explain the same
(b)   Explain key steps of risk identification.
(c)   Discuss the concept of six sigma.
(d)   Explain the key roles of project management.
(e)   Write a short note on activities of contract administration.
(f)   What is communication management? Explain.

Q. 3   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Explain leadership style in Project management.
(b)   What are the factors to look for in a Agile Project Tool?
(c)   Write a short note on Stress in Project.
(d)   Describe any Five ways in which Managers deal with Conflict.
(e)   Explain the basic communication strategy adopted with stakeholders in a
Project.
(f)   What are the four basic principles of Project governance?

Q. 4   Attempt <u>ANY FIVE</u> from the following: **(15M)**
(a)   Mention the various selection Criteria for Project Selection
(b)   What are the key steps in Quality Assurance?
(c)   Explain the steps adopted in the Staffing process in a Project?
(d)   Describe the role of Project Manager in a Project.
(e)   State the major activities involved in Change Management of a Project.
(f)   Differentiate between Business Risk and Project Risk.

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40186

(2 ½ Hours)   **[Total Marks: 75]**

N.B.   1) **All questions are compulsory.**
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3) **Illustrations, in-depth answers and diagrams will be appreciated.**
4) **Mixing of sub-questions is not allowed.**

Q. 1   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   What is an error? Explain Types of Errors.
(b)   What is quality in software development? Explain software quality factors.
(c)   What is Quality Assurance? Define the purpose of QA in software development.
(d)   Explain the role of testing in each phase of SDLC.
(e)   What is a V-Model in software testing?.
(f)   Explain the concepts of Software Review, Inspection and walkthrough

Q. 2   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   What are software Testing metrics? Explain different types of metrics.
(b)   What is Black Box testing and its types? Explain state transition testing.
(c)   Explain top-down integration testing.
(d)   What is White Box testing and its types? Explain flow graph notation.
(e)   What is System Testing? Explain different types of testing.
(f)   Explain testing documentation in detail.

Q. 3   Attempt <u>ANY FOUR</u> from the following: **(20M)**
(a)   Explain the defect management process in detail with a neat diagram.
(b)   Explain cause and effect diagram.
(c)   Explain about software metrics and its importance.
(d)   What is a Pareto diagram? Explain steps of drawing a Pareto chart.
(e)   List various methodologies of quality improvement. Explain any four.
(f)   Explain scatter diagram in detail.

Q. 4   Attempt <u>ANY FIVE</u> from the following: **(15M)**
(a)   Explain objectives of SQA.
(b)   Discuss Cyclomatic Complexity with an example.
(c)   How to use a defect for process improvement.
(d)   State the principles of software testing.
(e)   Explain metric lifecycle.
(f)   How to measure quality cost?

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40178