OMR Answer Sheet No.

Question Booklet Number

4040

BCA IV Semester Examination, 2024-25

Booklet Series
A

ARTIFICIAL INTELLIGENCE

Paper-III

(To be filled by the Candidate / निम्न पूर्तियाँ परीक्षार्थी स्वयं भरें)

Roll No. (in figures)
अनुक्रमांक (अंकों में) ——

Roll No. (in words)
अनुक्रमांक (शब्दों में) ——

[Time : 2 : 00 Hours
[समय : 2 : 00 घण्टे

[Maximum Marks : 50
[अधिकतम अंक : 50

Name of Examination Centre
परीक्षा केन्द्र का नाम ——

Signature of Invigilator
कक्ष निरीक्षक के हस्ताक्षर

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. **The booklet contains 100 questions. Examinee is required to answer any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. In case Examinee attempts more than 75 Questions, first 75 attempted questions will be evaluated. All questions carry equal marks.**
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be immediately replaced.

(Remaining Instructions on next page)

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को किन्हीं 75 प्रश्नों को दी गई ओ०एम०आर० आन्सर-शीट पर ही हल करना है। परीक्षार्थी द्वारा 75 से अधिक प्रश्नों को हल करने की स्थिति में, प्रथम 75 उत्तरों को ही मूल्यांकित किया जायेगा। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR उत्तर-पत्रक को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका, जिसमें कुछ भाग छपने से छूट गये हों या प्रश्न एक से अधिक बार छप गये हों या किसी भी प्रकार की कमी हो, उसे तुरन्त बदल लें।

(शेष निर्देश अगले पृष्ठ पर)

1. Which of the following is NOT a subset of AI?
   (A) Machine Learning
   (B) Natural Language Processing
   (C) Blockchain Technology
   (D) Computer Vision

2. What is the goal of Machine Learning?
   (A) To mimic human behavior
   (B) To solve complex mathematical problems
   (C) To enable computers to learn from data and improve their performance on specific tasks without being explicitly programmed
   (D) To develop advanced robotics systems

3. What is the Turing Test?
   (A) A test to a assess the speed of computers
   (B) A test to evaluate the logical reasoning of machines
   (C) A test to determine a machine's ability to exhibit intelligent behavior indistinguishable from that of a human
   (D) A test to measure memory capacity in computers

4. What is Natural Language Processing (NLP)?
   (A) The study of algorithms that can improve over time
   (B) The process of mimicking human speech by computers
   (C) The ability of computers to understand, interpret and generate human language
   (D) A branch of mathematics focused on logical reasoning

5. What is the main difference between supervised and unsupervised learning?
   (A) Supervised learning requires labeled data, while unsupervised learning does not
   (B) Unsupervised learning requires labeled data, while supervised learning does not
   (C) There is no difference between supervised and unsupervised learning
   (D) None of the above

6. Which AI technique involves allowing a computer to learn from its own experiences?

(A) Natural Language Processing

(B) Supervised Learning

(C) Reinforcement Learning

(D) Unsupervised Learning

7. What is an AI algorithm?

(A) A set of rules for performing specific tasks

(B) A technique for data analysis

(C) A type of neural network

(D) A sequence of instructions designed to solve a problem or perform a task using AI techniques

8. What is the role of data in AI?

(A) Data is not necessary for AI algorithms

(B) Data is used only in supervised learning

(C) Data is only used in unsupervised learning

(D) Data is used to train AI models and improve their performance

9. Which of the following is an example of AI applications in the real world?

(A) Sending emails

(B) Playing video games

(C) Autonomous vehicles

(D) Sorting files on a computer

10. Which term refers to the ability of machines to perform tasks that typically require human intelligence?

(A) Automation

(B) Machine learning

(C) Robotics

(D) Artificial intelligence

11. What does the Turing Test assess regarding artificial intelligence?

(A) The ability of a machine to exhibit human like behavior

(B) The processing speed of a machine compared to humans

(C) The accuracy of machine learning algorithms

(D) The energy efficiency of AI systems

12. What is the lowest level of the Knowledge Pyramid?

(A) Wisdom

(B) Understanding

(C) Data

(D) Information

13. What is the Knowledge Pyramid?

(A) A structure used in ancient civilizations for storing knowledge

(B) A conceptual model that categorizes knowledge into different levels, from data to wisdom

(C) A representation of knowledge as a hierarchical model

(D) A tool for data visualization in AI system

14. What does the information level of the knowledge Pyramid represent?

(A) Raw facts and figures

(B) Processed and organized data

(C) Interpretation and insights derived from data

(D) Application of knowledge in decision making

15. What distinguishes Wisdom from other levels of the knowledge pyramid?

(A) It represents the ability to apply knowledge and experience to make sound judgments and decisions

(B) It involves raw data processing

(C) It focuses on data interpretation

(D) It is synonymous with information retrieval

16. What is the primary purpose of the knowledge pyramid?

(A) To visualize data in AI systems

(B) To prioritize information over knowledge

(C) To illustrate the progression from raw data to actionable insights and wisdom

(D) To quantify knowledge in numerical terms

17. How does the Knowledge Pyramid contribute to decision-making in organizations?

(A) By emphasizing data over information

(B) By prioritizing wisdom over understanding

(C) By limiting the role of data in decision making

(D) By providing a framework for organizing and leveraging knowledge at different levels

18. Which from the following tasks computer can typically perform better than humans?

(A) Creative problem solving

(B) Performing complex mathematical calculations

(C) Emotional intelligence

(D) Social interaction

19. In which area are computers generally superior to humans?

(A) Empathy

(B) Artistic expression

(C) Memory recall and data storage

(D) Linguistic interpretation

20. In which area do humans generally outperform computers?

(A) Recognizing and understanding subtle patterns and contexts

(B) calculation speed

(C) Analyzing large datasets

(D) Simultaneously processing multiple tasks

21. What is a characteristic of an AI problem?

(A) Well-defined and straightforward

(B) Complex and ambiguous

(C) Limited to a single solution approach

(D) Solvable using traditional algorithms only

22. What differentiates AI problems from traditional computational problems?

(A) Predictable outcomes

(B) Inherent uncertainty and variability

(C) Singular solution approaches

(D) Reliance solely on mathematical algorithms

23. What makes AI problems challenging to solve?

(A) Involvement of multiple conflicting objectives and constraints

(B) Fixed problem formulations

(C) Limited variability of uncertainty

(D) Dependency on manual human intervention

24. What is problem representation in AI?

(A) Solving problems without representing them

(B) Expressing a problem in a formalized, structured manner that can be understood and manipulated by an AI system

(C) Generating random solutions to problems

(D) Ignoring problem complexities during solution development

25. Which of the following is NOT a common form of problem representation in AI?

(A) Informal, unstructured descriptions

(B) Logical representations

(C) Semantic networks

(D) State space representations

26. What is the primary benefit of using formal problem representations in AI?

(A) Increased complexity of problem-solving

(B) Limited adaptability to changing problem domains

(C) Facilitation of systematic analysis and solution development

(D) Decreased computational efficiency

27. What is the purpose of problem reduction techniques in AI?

(A) To increase the complexity of problem-solving

(B) To break down complex problems into simpler, more manageable subproblems

(C) To ignore problem complexities during solution development

(D) To generate random solutions to problems

28. What does the reasoning component of an AI system involve?

(A) Interpreting sensory inputs

(B) Executing actions based on inputs

(C) Processing and storing data

(D) Making decisions and drawing conclusions based on available information

29. When was the term "Artificial Intelligence" first coined?

(A) 1945

(B) 1956

(C) 1965

(D) 1975

30. Who is considered the "father of artificial intelligence"?

(A) John McCarthy

(B) Alan Turing

(C) Marvin Minsky

(D) None of the above

31. In which of the following areas has AI been extensively used to personalize user experiences and recommendations?

(A) Agriculture

(B) E-Commerce

(C) Healthcare

(D) Transportation

32. Which industry has most benefited from AI technologies such as predictive maintenance and fault detection?

(A) Retail

(B) Entertainment

(C) Finance

(D) Manufacturing

33. Which field utilizes AI for fraud detection, risk assessment, algorithmic trading and customer service automation?

(A) Healthcare

(B) Education

(C) Finance

(D) Agriculture

34. In which sector is AI employed for enhancing crop monitoring, precision agriculture and yield predication?

(A) Agriculture

(B) Healthcare

(C) Transportation

(D) Energy

35. Which sector utilizes AI for patient diagnosis and treatment recommendation, medical imaging analysis and drug discovery?

(A) Agriculture

(B) Retail

(C) Finance

(D) Healthcare

36. Who proposed The Turing Test?

(A) Alan Turing

(B) John McCarthy

(C) Marvin Minsky

(D) None of the above

37. Which of the following is NOT a requirement for a machine to pass The Turing Test?

(A) Ability to understand natural language

(B) Ability to exhibit consciousness

(C) Capacity for logical reasoning

(D) Appropriately responding to questions

38. What is The Revised Turing Test?

(A) An extended version of The Turing Test that includes additional tasks beyond conversation

(B) An updated version of The Turing Test with stricter evaluation criteria

(C) A modified versions of The Turing Test that focuses on logical reasoning

(D) An alternative test proposed by John McCarthy

39. How does The Revised Turing Test address some of the limitations of The Turing Test?

(A) By introducing stricter evaluation criteria for judges

(B) By increasing the number of participants involved

(C) By limiting the interaction time between the judge and the machine

(D) By incorporating additional tasks that require intelligence beyoned conversation

40. What is an Expert System (ES)?

(A) A system designed to simulate human emotions

(B) A system that performs tasks autonomously without human intervention

(C) A system that emulates the decision making ability of a human expert in a specific domain

(D) A system used exclusively for data storage and retrieval

41. Which of the following is NOT a characteristic of Expert Systems?

(A) Autonomous decision making without human guidance

(B) Knowledge representation

(C) Knowledge acquisition

(D) Inference engine

42. What is the primary function of an Inference Engine in an Expert System?

(A) Acquiring knowledge from experts

(B) Representing knowledge in a structured format

(C) Performing reasoning and drawing conclusions based on available knowledge

(D) Storing vast amounts of data

43. Which component of an Expert System is responsible for acquiring knowledge from human experts?

(A) Knowledge Base

(B) Inference Engine

(C) User Interface

(D) Knowledge Acquisition System

44. What role does the User Interface play in an Expert System?

(A) Processing and storing data

(B) Performing reasoning and inference

(C) Facilitating communication between the user and the system

(D) Acquiring knowledge from experts

45. In an Expert System, what is the purpose of the Explanation Facility?

(A) Providing explanations for the system's recommendations or decisions

(B) Performing reasoning and inference

(C) Acquiring knowledge from experts

(D) Organizing and structuring domain knowledge

46. What is the primary function of the inference engine in an Expert System?

(A) Acquiring knowledge from human experts

(B) Storing domain-specific knowledge and facts

(C) Performing reasoning and drawing conclusions based on available knowledge

(D) Providing explanations for the system's decisions

47. What is the primary goal of the Expert System Life Cycle?

(A) To develop general purpose software applications

(B) To systematically develop, deploy and maintain expert systems

(C) To automate routine tasks in an organization

(D) To train machine learning models

48. Which of the following is NOT a phase in the Expert System Life Cycle ?

(A) Knowledge Acquisition

(B) Inference Engine Development

(C) User Interface Testing

(D) Knowledge Base Verification and Validation

49. In the Expert System Life Cycle, what occurs during the knowledge base verification and validation phase?

(A) The accuracy and consistency of knowledge in the system's knowledge base are evaluated

(B) User interface design is finalized

(C) The system's inference engine is developed

(D) The system is deployed for end users

50. During which phase of the Expert System Life Cycle are user requirements analyzed?

(A) Inference Engine Development

(B) Deployment

(C) Problem formulation

(D) Knowledge Base verification and validation

51. What is the primary function of a Knowledge Based Expert System (KBES)?

(A) To process and analyze large datasets

(B) To capture, represent and apply domain-specific knowledge

(C) To automate routine tasks in an organization

(D) To perform complex mathematical calculations

52. Which type of expert system relies on a database of rules and facts to make decisions?

(A) Rule Based Expert System

(B) Neural Network Expert System

(C) Fuzzy Logic Expert System

(D) All of the above

53. What distinguishes a knowledge based system from other types of expert systems?

(A) Its ability to learn from experience

(B) Its reliance on statistical analysis

(C) Its focus on capturing and applying domain specific knowledge

(D) Its use of neural networks for decision making

54. In a Rule Based Expert System, how are decisions made?

(A) By applying statistical analysis to historical data

(B) By using neural networks for pattern recognition

(C) By applying a set of rules to the available data

(D) None of the above

55. What is a primary advantage of Expert Systems?

(A) They can capture and leverage expert knowledge for decision making

(B) They are highly adaptable to changing environments

(C) They require extensive training data

(D) None of the above

56. How do Expert Systems contribute to decision making in business?

(A) By providing emotional support to executives

(B) By replacing the need for human decision makers

(C) By offering insights and recommendations based on expert knowledge

(D) All of the above

57. In the Knowledge Acquisition phase, what techniques are commonly used to gather knowledge?

(A) Surveys and questionnaires

(B) Observations and interviews

(C) Both (A) and (B)

(D) None of the above

58. What is the primary focus of the Testing phase in Expert System Development?

(A) Testing the system's user interface

(B) Evaluating the system's performance

(C) Verifying the working of Knowledge Base

(D) Verifying that the system makes correct decisions

59. In Expert System development, what occurs in the deployment phase?

(A) The system is made available for use by end users

(B) The system is integrated into the operational environment

(C) The system is tested with a small group of users

(D) Both (B) and (C)

60. Which of the following activities is NOT typically associated with the identification phase during Expert System development?

(A) Development of rules and facts

(B) Writing code for the inference engine

(C) Gathering knowledge from domain experts

(D) Analyzing potential problem areas

61. What is the primary objective of the conceptualization phase in developing an Expert System?

(A) Writing code for the inference engine

(B) Gathering knowledge from domain experts

(C) Defining the scope, goals and objectives of the expert system

(D) Designing the user interface

62. During the conceptualization phase in Expert System development, what is the emphasis on?

(A) Understanding the problem domain and its requirements

(B) Developing the knowledge base

(C) Implementing algorithms

(D) Testing the system's performance

63. What is the primary output of the conceptualization phase in Expert System development?

(A) Detailed system architecture

(B) Implementation plan

(C) A conceptual design document outlining system goals, requirements and scope

(D) Finalized knowledge base

64. What is the primary purpose of using an Expert System?

(A) Generating random solutions

(B) Automating routine tasks

(C) Generating complex algorithms

(D) Assisting in decision-making and problem solving

65. Which of the following is not a type of uninformed search algorithm?

(A) Breadth-first search

(B) Depth first search

(C) A* search

(D) Iterative deepening search

66. In the context of search algorithms, what does "heuristic" refer to?

(A) An algorithm that guarantees finding the optimal solution

(B) A function that estimates the cost of reaching the goal from a given state

(C) A search strategy that always explores the deepest nodes first

(D) A search strategy that expands the shallowest nodes first

67. Which search algorithm guarantees finding the shallowest solution in a search tree?

(A) Breadth first search

(B) Depth first search

(C) Uniform cost search

(D) A* search

68. Which of the following is an informed search algorithm?

(A) Breadth first search

(B) Depth first search

(C) Greedy best first search

(D) Depth limited search

69. Which search algorithm combines the benefit of depth-first search and breadth-first search while avoiding their limitations?

(A) Uniform cost search

(B) A* search

(C) Bidirectional search

(D) Iterative deepening search

70. Which search algorithm is more memory efficient among the following?

(A) Depth-first search

(B) Breadth-first search

(C) A* search

(D) Uniform cost search

71. Which of the following search algorithms is suitable for finding the shortest path in a weighted graph?

(A) Depth-first search

(B) Uniform-cost search

(C) Breadth-first search

(D) All of the above

72. Which search algorithm should be chosen when the search space is infinite and the goal state might not be reachable?

(A) Iterative deepening search

(B) Depth-first search

(C) A* search

(D) Uniform-cost search

73. Which search algorithm is suitable for finding the shallowest solution in a search tree?

(A) Depth-First Search (DFS)

(B) Breadth-First Search (BFS)

(C) Uniform-Cost Search

(D) A* Search

74. Which of the following data structures is typically used for implementing Breadth-First Search?

(A) Stack

(B) Queue

(C) Priority Queue

(D) Linked List

75. What is the primary goal of Constraint Satisfaction Problems (CSPs)?

(A) To maximize the objective function

(B) To minimize the number of constraints

(C) To find a solution that satisfies all constraints

(D) To explore all possible search paths

76. What is the primary objective of Mean-End Analysis (MEA) in problem solving?

(A) To generate all possible solutions exhaustively

(B) To identify the mean (midpoint) of the search space

(C) To analyze the difference between the start and goal states

(D) To reduce the difference between the current state and the goal state

77. Which data structures is typically used to implement Best-First Search?

(A) Stack

(B) Queue

(C) Priority Queue

(D) Hash Table

78. What is Natural Language Processing (NLP) primarily concerned with?

(A) Analyzing computer programming languages

(B) Understanding and processing human languages by computers

(C) Generating artificial languages for specific purposes

(D) Translating between different programming languages

79. Which of the following is NOT a subfield of Natural Language Processing (NLP)?

(A) Machine Learning

(B) Computational Linguistics

(C) Information Retrieval

(D) Robotics

80. What is the main goal of Natural Language processing?

(A) To translate text from one human language to another

(B) To enable computers to understand, interpret and generate human language

(C) To analyze the syntax and structure of computer programming languages

(D) To develop advanced speech recognition systems

81. Which of the following tasks falls under the category of Natural Language Generation (NLG)?

(A) Speech recognition

(B) Sentiment analysis

(C) Text summarization

(D) Part of search tagging

82. What is the main difference between speech recognition and Natural Language Processing?

(A) Speech recognition focuses on written text, while NLP focuses on spoken language

(B) NLP is exclusively concerned with syntactic analysis of language

(C) Speech recognition is a subfield of NLP

(D) NLP involves understanding and processing human language, while speech recognition involves converting spoken language to text

83. Which linguistic level is primarily concerned with the meaning of words and phrases?

(A) Semantics

(B) Syntax

(C) Phonology

(D) None of the above

84. Which technology enables computers to process and understand human language?

(A) Blockchain

(B) Quantum computing

(C) Natural Language Processing

(D) Virtual reality

85. What is the primary need for Natural Language Understanding (NLU) in Artificial Intelligence?

(A) To develop better programming languages

(B) To enable computers to communicate effectively with humans

(C) To improve hardware performance

(D) To create more efficient databases

86. Which linguistic level is primarily concerned with the structure and rules of a language?

(A) Syntax

(B) Phonology

(C) Semantics

(D) None of the above

87. What is the primary goal of Speech Recognition technology?

(A) To convert spoken language into written text

(B) To translate text from one language to another

(C) To recognize different accents and dialects

(D) To generate human like speech

88. What is one of the primary advantages of speech recognition technology?

(A) Slower processing compared to typing

(B) Inability to handle multiple language

(C) Hands free operation

(D) None of the above

89. What is the purpose of an actuator in a robot?

(A) To detect changes in the environment

(B) To process sensory information

(C) To physically move or manipulate objects

(D) To control the overall behavior of the robot

90. What is the primary purpose of AI in communication?

(A) Enhancing human computer interaction

(B) Increasing data security

(C) Improvin g physical infrastructure

(D) Streamlining administrative tasks

91. Which of the following is an example of AI-driven communication technology?

(A) Email

(B) Telepathy

(C) Semaphore

(D) Chatbots

92. How does AI impact customer service communication?

(A) by reducing customer engagement

(B) By automating responses and improving efficiency

(C) By increasing human error

(D) By limiting communication channels

93. Which AI powered application facilitates voice search in smartphones?

(A) Siri

(B) Google Maps

(C) Whatsapp

(D) Instagram

94. What is the primary goal of semantic interpretation in Artificial Intelligence?

(A) Identifying spelling mistakes in text

(B) Parsing the grammatical structure of sentences

(C) Understanding the meaning of language

(D) Translating text from one language to another

95. What is the role of semantic interpretation in Natural Language Processing (NLP)?

(A) Identifying punctuation marks

(B) Understanding the meaning of sentences

(C) Extracting phonetic features

(D) Removing syntactic patterns

96. What is ambiguity in the context of Natural Language Processing (NLP)?

(A) Precision in language understanding

(B) Lack of clarity or multiple interpretations in language

(C) Consistency in sentence structure

(D) Limited vocabulary usage

97. In Natural Language Processing (NLP), what is disambiguation?

(A) Introducing more ambiguity in language

(B) Limiting vocabulary usage

(C) Ignoring language semantics

(D) The process of resolving ambiguity in language

98. What is the primary goal of information retrieval in Artificial Intelligence?

(A) Identifying grammatical error in text

(B) Extracting semantic meaning from documents

(C) Retrieving relevant information from a large collection of data

(D) Limiting the availability of search results

99. What is the primary goal of information extraction in Artificial Intelligence?

(A) Removing irrelevant information from documents

(B) Identifying the sentiment of text

(C) Automatically extracting structured information from unstructured data

(D) Limiting the availability of search results

100. What is the primary goal of machine translation in Artificial intelligence?

(A) Converting images to text

(B) Generating speech from text

(C) Summarizing long texts into shorter versions

(D) Automatically translating text from one language to another