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 Barasat, Kolkata -700125



BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – M.Sc.(MLT)-2023

Course Name – Application of AI in Medical Science

Course Code - MMTC04003

(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the primary goal of Artificial Intelligence.
 - a) Mimicking human intelligence to perform tasks
 - b) Enhancing physical strength in robots
 - c) Replacing all human jobs with automation
 - d) Limiting technology usage in industries
- (ii) Summarize the essential components of an AI system.
 - a) Data, Algorithms, Computing Power
 - b) Sensors, Motors, Human Operators
 - c) Hardware, Electricity, Random Processing
 - d) Websites, Social Media, Cloud Storage
- (iii) Explain the key characteristic of supervised learning.
 - a) Uses labeled data for training
 - b) Learns without any human intervention
 - c) Does not require any historical data
 - d) Identifies patterns without predefined classes
- (iv) Explain how unsupervised learning finds patterns in data.
 - a) Identifies structures and relationships without labels
 - b) Maps inputs directly to outputs
 - c) Requires a human to define all possible clusters
 - d) Relies solely on decision trees for classification
- (v) Choose the technology that is driving advancements in AI.
 - a) Deep Learning
 - b) Blockchain
 - c) Cloud Computing
 - d) All (1, 2, 3)
- (vi) Identify the major challenge in AI adoption in healthcare.
 - a) Data privacy concerns
 - b) High computational costs
 - c) Lack of skilled professionals
 - d) All (1, 2, 3)
- (vii) Identify the application of AI in real-time health analytics.
 - a) Predicting patient deterioration
 - b) Manual record-keeping
 - c) Reducing hospital beds
 - d) Slower data access
- (viii) Determine the reason AI is useful in outbreak prediction.

- a) Analyzing large datasets
c) Increasing misinformation
- b) Delaying research
d) Slowing response time
- (ix) Choose the primary goal of data analysis in healthcare.
- a) Improving patient outcomes
c) Reducing AI adoption
- b) Increasing hospital costs
d) Slower decision-making
- (x) Identify the key challenge in big data analytics for healthcare.
- a) Data privacy concerns
c) Limited computational power
- b) Lack of patient records
d) Lower medical costs
- (xi) Select the most appropriate ML model commonly used for predicting disease outcomes in healthcare.
- a) K-Means Clustering
c) Apriori Algorithm
- b) Decision Trees
d) Principal Component Analysis
- (xii) Choose the correct step when developing an AI application in healthcare for class demonstration.
- a) Ignore model evaluation
c) Collect and preprocess healthcare data
- b) Use unrelated datasets
d) Focus only on UI design
- (xiii) Select the tool commonly used to build a deep learning model in Python.
- a) Pandas
c) Excel
- b) TensorFlow
d) NumPy
- (xiv) Choose the key application of image segmentation in medical imaging.
- a) Enhancing image brightness
c) Adding noise to MRI images
- b) Detecting bone fractures
d) Reducing color variation
- (xv) Select the NLP technique used in language translation applications.
- a) Backpropagation
c) Tokenization
- b) Convolution
d) Image segmentation

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Summarize the fundamental principles of Artificial Intelligence (AI) and its impact on modern technology. (3)
3. Explain the key difference between supervised and unsupervised learning. (3)
4. Explain how big data is transforming healthcare. (3)
5. Justify the need for AI in healthcare and highlight its major benefits. (3)
6. Illustrate the process of clustering in an unsupervised learning algorithm using an example. (3)

OR

Illustrate a simple decision tree with a binary classification problem. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the role of predictive analytics in clinical decision support and its impact on patient outcomes. (5)
8. Prepare a comparative analysis of AI-driven diagnostic tools and traditional diagnostic methods in healthcare. (5)
9. Write an evaluation of AI-driven wearable health monitoring devices and their impact on patient care. (5)
10. Analyze the impact of AI applications in healthcare and discuss their benefits and challenges. (5)
11. Compare backpropagation and gradient descent in training neural networks. (5)
12. Compare different approaches to sentiment analysis in natural language processing. (5)

OR

Evaluate the role of AI-driven language translation models in global communication and business. (5)

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