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Subject:

Topic: Advanced AI Modelling Concepts

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**Section A: AI Modelling & Learning Approaches (10 MCQs)**

1. **Which of the following is NOT a type of AI model?**
  - a) Rule-Based Model
  - b) Learning-Based Model
  - c) Logical Model
  - d) Supervised Model
  
2. **Which of the following best describes Supervised Learning?**
  - a) AI learns from labeled data
  - b) AI learns without labels
  - c) AI learns through rewards and penalties
  - d) AI does not require any training
  
3. **In which learning approach does AI explore data without predefined labels?**
  - a) Supervised Learning
  - b) Reinforcement Learning
  - c) Unsupervised Learning
  - d) Semi-Supervised Learning
  
4. **Which AI learning model is used in self-driving cars?**
  - a) Supervised Learning
  - b) Unsupervised Learning
  - c) Reinforcement Learning
  - d) None of the above
  
5. **What is the purpose of a neural network in AI?**
  - a) To execute pre-written rules
  - b) To learn and recognize patterns from data
  - c) To replace human decision-making
  - d) To store large datasets
  
6. **Which type of neural network is commonly used for image recognition?**
  - a) Recurrent Neural Network (RNN)
  - b) Convolutional Neural Network (CNN)
  - c) Artificial Neural Network (ANN)
  - d) Generative Adversarial Network (GAN)



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7. **Which machine learning approach allows AI to learn by receiving rewards or penalties?**
  - a) Supervised Learning
  - b) Unsupervised Learning
  - c) Reinforcement Learning
  - d) Deep Learning
  
8. **Which of the following AI models is best for speech recognition?**
  - a) CNN
  - b) RNN
  - c) Rule-Based Model
  - d) Decision Tree
  
9. **Which AI concept helps in categorizing emails as spam or not spam?**
  - a) Classification
  - b) Clustering
  - c) Regression
  - d) Reinforcement Learning
  
10. **Which of the following is an example of a real-world application of clustering?**
  - a) Identifying handwritten digits
  - b) Grouping customers based on shopping behavior
  - c) Predicting stock market prices
  - d) Detecting spam emails

### **Section B: Neural Networks & AI Applications (5 MCQs)**

11. **Which of the following is a key component of a neural network?**
    - a) Layers
    - b) Pixels
    - c) RAM
    - d) Motherboard
  
  12. **What is the role of an activation function in a neural network?**
    - a) To store data
    - b) To determine output based on input
    - c) To add layers to the network
    - d) To remove errors
  
  13. **Which AI concept is used in recommendation systems like Netflix and YouTube?**
    - a) Supervised Learning
    - b) Clustering
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- c) Reinforcement Learning
- d) Deep Learning

14. Which of the following is a major challenge in training deep learning models?

- a) Lack of data
- b) High computational cost
- c) Overfitting
- d) All of the above

15. What is the key difference between Supervised and Unsupervised Learning?

- a) Supervised Learning uses labelled data, while Unsupervised Learning does not.
- b) Supervised Learning is faster than Unsupervised Learning.
- c) Supervised Learning is used only for classification.
- d) Unsupervised Learning always provides accurate predictions.

Answer the following questions:

1. Give a difference between rule based and learning based AI models.
2. Explain neural networks. Also give functions of three layers of neural networks.
3. What is Natural Language Processing? Explain any two real-life applications of NLP.
4. What is supervised, unsupervised and reinforcement learning? Explain with examples.
5. Differentiate between classification and regression model.
6. What is clustering and how is it different from classification?

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