IoT Data Analytics and Machine Learning Question Bank for End-Term

2 MARKS

1. Outline the World Forum architecture for IoT.
2. Differentiate between structured and unstructured data with an example.
3. What is the difference between trend and seasonality?
4. Define data exploration in the context of IoT data.
5. Define bias and variance in machine learning.
6. Define Machine Learning in the context of IoT.
7. Define data retention.
8. What is data archiving?
9. What are IoT connectivity protocols? Give two examples.
10. Define MQTT and state one use case.
11. Outline the oneM2M architecture for IoT.
12. Summarize the features of Zigbee.
13. Define descriptive and inferential statistics.
14. What is feature engineering in IoT data analysis?
15. What is the role of the Fast Fourier Transform (FFT) in IoT data analysis?
16. Define the term data swamp.
17. What does data linking mean in analytical datasets?
18. Name any two challenges faced in IoT analytics.
19. What is IoT analytics and why is it important?
20. Give the importance of IoT analytics.

10 MARKS

Module 1

1. Explain the types of Data Analytics with suitable examples.

2. Explain the challenges of IoT with examples.

3. Outline the structure of the oneM2M model of IoT.

4. Describe features of any four Network-layer protocols in IoT.

5. Classify sensor and actuator types in IoT with examples.

6. Outline the structure of the 7-layered architecture of IoT.

7. Differentiate between MQTT queue and traditional message queues.

8. Describe any four Application-layer protocols in IoT.

9. Outline the structure of the World Forum architecture of IoT.

10. Traditional message queues differ from MQTT queues – justify.

11. Explain the types of sensors and actuators in IoT with examples.

Module 2

12. Explain the steps involved in exploring IoT data.

13. Illustrate the process involved in time series analysis.

14. Illustrate the techniques to understand and improve data quality in IoT cloud processing.

15. Interpret common techniques for exploring and visualizing IoT data with examples.

16. Describe the methods applied to assess and enhance data quality during IoT cloud data processing.

17. Describe the various steps carried out while exploring IoT-generated data.

18. Describe the advantages and disadvantages of time series analysis.

Module 3

19. Explain how feature engineering improves IoT-based ML model performance and list the steps involved.

20. Describe how analytical methods are validated and outline key validation parameters to ensure IoT analytics are dependable.

21. Demonstrate how bias and variance affect the accuracy of IoT data models and suggest ways to minimize them.

22. Explain the advantages of machine learning inference on IoT data.

23. Describe the different validation metrics for evaluating a model.

24. Elaborate on the benefits of applying machine learning inference to IoT-generated data.

25. Describe the steps involved in feature engineering to enhance machine learning models' effectiveness.

26. With a neat diagram, explain the concept of Deep IoT.

Module 4

27. Explain in detail the risk, security, cost, and governance considerations associated with data retention.

28. Compare Linked Analytical Datasets with traditional data warehouse datasets.

29. Discuss the challenges in managing data lakes and how organizations overcome them.

30. Describe the steps in designing and implementing a Data Retention and Archiving Strategy for a large organization.

31. What is a Data Lake? Explain the layered architecture of a data lake with examples.

32. Explain the end-to-end process of designing, integrating, and maintaining Linked Analytical Datasets.