END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2024

Paper Code: ML-463T	Subject: *Supervised and Deep Learning*
Time: 3 Hours	Maximum Marks: 75

Note: Attempt any five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Attempt **any five** of the following questions: **(5x5=25)**
   a) What are Autoencoders?
   b) Compare learning and optimization in context of Deep Learning.
   c) What is the role of Sentiment analysis in social media monitoring?
   d) Which cross-validation technique would you suggest for a time-series dataset and why?
   e) Discuss the role of batch normalization in regularization.
   g) Differentiate Single layer and Multilayer perceptron.
   h) What are some typical applications of RNN?

UNIT-I

Q2 Compare over fitting with under fitting. Explain how the over fitting can be handled in Machine learning.   **(12.5)**

OR

Q3 Compare and Contrast Linear Regression and Logistic Regression. What are the key metrices used to check the performance of Logistic Regression?   **(12.5)**

UNIT-II

Q4 How Machine learning and Deep learning are different? What are the advantages of deep learning over Machine learning?   **(12.5)**

OR

Q5 What is ANN? Explain the process of backpropagation in ANN with the help of example.   **(12.5)**

UNIT-III

Q6 Explain CNN and its architecture.   **(12.5)**

OR

Q7 What are Instance Segmentation and Image Segmentation.   **(12.5)**

UNIT-IV

Q8 What is the application of Generative Adversarial Networks (GANs)? Differentiate Conditional GANs and Unconditional GANs.   **(12.5)**

OR

Q9 What do you mean by NLP? What are the different tasks in NLP?   **(12.5)**

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] DECEMBER 2024

Paper Code: ML-465T   Subject: *Unsupervised Learning*

Time: 3 Hours   *Maximum Marks: 60*

Note: Attempt all questions as directed. Internal choice is indicated.

(4x5=20)

Q1 Attempt **any five** of the following:-
    (a) What is unsupervised learning?
    (b) What is association rule mapping?
    (c) What is Geodesic distance?
    (d) What is manifold learning?
    (e) Describe the loss function used in Auto-encoders.
    (f) What is the difference between PCA and Auto-encoders?
    (g) What is an outlier? How is it different from noise?
    (h) What is topic modeling?

UNIT-I

Q2 (a) What are the main clustering methods used in machine learning? Explain each briefly. **(8)**
    (b) What is Bi-Clustering? **(2)**

OR

Q3 (a) What are the metrics used in Association rule learning? **(5)**
    (b) What is Apriori algorithm? **(5)**

UNIT-II

Q4 (a) What is ISOMAP? What are the advantages and disadvantages of ISOMAP method? **(5)**
    (b) Explain t-SNE algorithm and its applications. **(5)**

OR

Q5 (a) What is PCA? Explain its algorithm in detail. **(5)**
    (b) What is factor analysis? What are its assumptions? **(5)**

UNIT-III

Q6 (a) What is an auto encoder? What are the different types of auto encoders? **(6)**
    (b) What are the applications of auto encoders? **(4)**

OR

Q7 (a) Explain the GAN architecture in detail? **(5)**
    (b) What are the major challenges in training of GANs. **(5)**

UNIT-IV

Q8 (a) Describe the various methods to detect outliers in machine learning. **(6)**
    (b) What is density estimation in Machine learning? **(4)**

OR

Q9 (a) What is the advantage of using KDE instead of histogram? **(4)**
    (b) What is Kohonen's self organizing map in detail? **(6)**

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETEC-405	*Subject: Wireless Communication*
Time: 3 Hours	*Maximum Marks: 75*

> *Note: Attempt five questions including Q.No.1 which is compulsory.*
> *Select one question from each unit. Assume missing data, if any.*

Q1   Answer the following briefly:
- a) Define Co-Channel cells with relevant diagram? What is Co-Channel Interference and how can it be reduced? **(3)**
- b) What is SIM card? What information is stored in it? What are IMSI, TMSI and MSRN numbers in GSM? **(4)**
- c) Why hexagonal shape is preferred in cellular mobile system and explain frequency reuseconcept. **(3)**
- d) What is fading in cellular networks? Compare Rayleigh & Ricean fading. **(4)**
- e) Explain the power saving modes of Bluetooth devices. **(2)**
- f) Discuss the handoff detection strategies: MCHO, NCHO and MAHO. **(3)**
- g) What is the advantage of IPV6over IPV4 **(3)**
- h) Explain the WLL architecture with neat diagram. **(3)**

UNIT–I

Q2   a) Briefly explain the frequency reuse concept and its importance. How does capacity of a network increase with help of Cell Splitting and Cell Sectoring techniques in Cellular Mobile networks. Draw relevant neat diagrams. **(6.5)**
      b) With help of a flow chart discuss the Subrating Scheme for channel assignment in a mobile cellular network. **(6)**

Q3   a) What do you understand by Unlicensed and Licensed bands? Give their examples. Compare the High Tier cellular, the cordless and low-tier PCS telephony systems based on their various characteristics such as cell size, user speed, coverage area, handset complexity, and handset power consumption, speech coding rates and delay or latency. **(6.5)**
      b) A certain city has an area of 1300 square miles and is covered by a cellular system using a seven-cell reuse pattern. Each cell has a radius of four milesand the city is allocated 40 MHz of spectrum with a full duplex channelbandwidth of 60 kHz. Compute, (area of a hexagon is 2.5981 R^2)
   - i)   the number of cells in the service area **(2)**
   - ii)   the number of channels per cell **(2)**
   - iii) total Number of subscribers that can be served **(2)**

UNIT -II

Q4   a) Explain how data encryption is done in GSM systems, with diagram, explaining the role of SIM, A3, A5 and A8 algorithms. **(6.5)**

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   b) Explain the importance of Handoff Threshold (Delta Δ) in GSM Networks with relevant diagrams. What impact does it have on the performance of the network? **(6)**

Q5   a) Explain the principle of Code Division Multiple access systems with supporting diagram. What are the advantages of CDMA technique over FDMA and TDMA techniques. **(6.5)**
      b) Why does power control become one of the main issues for the efficient operation of CDMA? What are the 2 types of power control? Why is it essential to implement power control in Reverse channel in IS 95 CDMA systems? **(6)**

UNIT-III

Q6   a) What is EDGE & which generation does it belong to? Explain how EDGE achieves greater data rates than allowed in GSM. **(6.5)**
      b) Explain the IMT-2000 vision. State the paradigm shift from 2G to 3G systems. Differentiate between W-CDMA and CDMA 2000. **(6)**

Q7   a) Explain the packet flow if two mobile nodes communicate and both are in foreign networks. What additional routes do packets take if reverse tunneling is required? **(6.5)**
      b) What are the salient features of 4G systems? Differentiate between 3G and 4G systems. Name the techniques used in 4G systems for improving the performance of the network. **(6)**

UNIT-IV

Q8   a) Differentiate between Adhoc Networks and Infrastructure Networks along with neat diagrams showing their architecture. Discuss the Hidden &Exposed Node problem in MANET **(6.5)**
      b) Draw piconet and scatternet. Describe the working of Bluetooth technology with diagram. **(6)**

Q9   a) Compare Iridium and GlobalStar under following points: **(6.5)**
      i) No.ofStatellites   ii) Attitude Coverage
      iii) Min Elevation   iv)Access Method
      v) Bit Rate   vi)No.of Channels
      vii)Frequencies
      b) Discuss the different deployment issues in wireless local loop deployment. **(6)**

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETCS-409	**Subject: Intellectual Property Rights**
Time: 3 Hours	**Maximum Marks: 75**

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 Attempt **any five**:-
   (a) Whats is an IPR? Why is it needed in a society? **(5)**
   (b) Explain the term "copyright" and its significance. **(5)**
   (c) Explain the significance of "trademark" in industry and commerce? **(5)**
   (d) What is the state of biotechnology research and its protection in India? **(5)**
   (e) Is "copyright" same as "trademark"? Give illustrations to demonstrate. **(5)**
   (f) What are legal issues in biotechnology research rights management? **(5)**

UNIT-I

Q2 (a) Describe the state of Intellectual Property Rights in India. **(6)**
   (b) Explain the process of patent filing. **(6.5)**

Q3 (a) What is the origin of IPR and how can it lead to protection of intellectual property from infringement? **(6)**
   (b) What are Utility models? How can it protect technical inventions from commercial exploitation? **(6.5)**

UNIT-II

Q4 (a) What are industrial design patents and their scope? **(6)**
   (b) Explain the copyright search process with the help of a diagram. Explain steps in brief. **(6.5)**

Q5 (a) What is copyright infringement? Explain with illustrations. **(6)**
   (b) Explain the difference between designs and patents. **(6.5)**

UNIT-III

Q6 (a) Explain the role of trademark in commerce. **(6)**
   (b) Write a short note on protection of breeder's rights in IPR. **(6.5)**

Q7 (a) What is a trademark license and what are its benefits? **(6)**
   (b) What is the need to protect a domain name and how can it be done? **(6.5)**

UNIT-IV

Q8 (a) What are the legal protections available to a biotechnology researcher in India. What are its limitations? **(6)**
   (b) Write a short note on guidelines for examination of biotechnology patents applications in India. **(6.5)**

Q9 (a) Discuss in detail a case study in IPR. **(6)**
   (b) Discuss a legal provision that protects the interests of an Indian farmer in relation to plant varieties. **(6.5)**

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH.] FEBRUARY 2023

Paper Code: ETEC405	**Subject: Wireless Communication**
Time: 3 Hours	**Maximum Marks: 75**

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1   Answer the following briefly: **(2.5x10 =25)**

    i)   What modifications are required in GSM architecture to support GPRS traffic.

    ii)   Explain RTS and CTS frames with respect to WLANs

    iii)   Explain Encapsulation & Tunnelling in Mobile IP networks with relevant diagrams.

    iv)   Explain piconets and scatternets in Bluetooth technology with diagrams.

    v)   Explain the concept of cell sectoring in Cellular Mobile networks with help of a neat diagram.

    vi)   Differentiate between soft handoff and hard handoff.

    vii)   Compare & contrast FDMA, TDMA & CDMA. Why is CDMA said to have a soft capacity.

    viii)   Give Differences between W-CDMA and CDMA 2000.

    ix)   Explain how infrastructure networks are different compared to adhoc networks.

    x)   Explain the Spread spectrum technique of FHSS with supporting diagram.

UNIT-I

Q2   a)   With help of a flow chart discuss the Subrating scheme of channel assignment for handling the mobile calls.   **(4)**

    b)   What is meant by different Generation of Wireless Networks? When do we conclude that the Generation has changed? Compare the various Generations of Wireless networks & their types w.r.t. Mobility, Range, Speed of Transmission Radio spectrum used.   **(4)**

    c)   Given a Cellular system in which there are a total of 1001 radio channels available for handling traffic. It is also given that the area of a cell is 6 km² and the area of the entire system is 2100 km-

      i)   Calculate the system capacity if the cluster size is 7.

      ii)   How many times would the cluster of size 4 have to be replicated in order to approximately cover the entire cellular area.

      iii)   Calculate the system capacity if the cluster size is 4.

                                              (4.5)

Q3   a)   What do you understand by fading in wireless channels? Explain the different types of fading that occur in wireless networks and state the conditions under which they occur.   **(12.5)**

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UNIT-II

Q4   a)   Explain how data encryption is done in GSM systems, with diagram, explaining the role of SIM, A3, A5 and A8 algorithms. **(6)**

b)   Explain the logical channels of GSM along with the classification chart and also state whether that channel is uplink channel or downlink channel. **(6.5)**

Q5   a)   Explain the principle of CDMA systems and how is power control done in them? **(6)**

b)   Discuss the effects of multipath propagation on CDMA systems. **(6.5)**

UNIT-III

Q6   a)   Explain the Data rate enhancement with the help of General Packet Radio Services (GPRS) Network model. What is the maximum data rate obtained by GPRS network? **(6)**

b)   Discuss about the quality of services in 3G and mention the limitations as well. **(6.5)**

Q7   a)   Explain the features of medium access and Inter frame Spacing aspects of a typical wireless LAN scenario. **(6.5)**

b)   How the agent can be discovered using Mobile IP? Give the overlay of Agent advertisement packet which includes mobility extension. **(6)**

UNIT-IV

Q8   With help of a diagram show the different states of a Bluetooth device. List the different power saving states of a Bluetooth device. Discuss in detail about Bluetooth protocol stack. **(12.5)**

Q9   Compare the case studies of IRIDIUM and GLOBAL STAR systems along with features of constellation of satellite in both cases. Discuss about uplink and down link chains as well mobile satellite. **(12.5)**

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