

ME - I Comp (CBCS)
Data Science

191517

Q.P. Code:16984

Time: 3 Hours

Marks: 80

Note: 1. Question 1 is compulsory

2. Answer any three out of remaining questions.
3. Assume suitable data wherever required and justify the same.

- Q1 a) Explain Linear discriminant analysis. [5]
b) What are the differences between supervised learning and unsupervised learning, elaborate with an example. [5]
c) What is the background of the formation of data journalism? [5]
d) Explain cross-validation for accuracy estimation. [5]
- Q2 a) Use PCA to transform 2D data space to 1D data space for the given matrix A. [10]
$$A = \begin{pmatrix} 0 & 1 \\ -2 & -3 \end{pmatrix}$$

b) Explain Maximum Likelihood estimation using expectation-maximization (EM). [10]
- Q3 a) Describe null hypothesis and alternative hypothesis with appropriate example [10]
b) Explain how Gaussian approximation works to a posterior distribution. [10]
- Q4 a) What type of problem were you looking to solve with text mining? How did you know how to text mine? What could be the challenges when text mining? [10]
b) Explain the process of collaborative based Recommendation System with suitable example. [10]
- Q5 a) Draw and describe the information visualization process. [10]
b) What infrastructure is most appropriate for Hadoop? Draw and describe Hadoop Ecosystem Architecture. [10]
- Q6 a) List and explain basic relational operators used in pig. [10]
b) What is the big deal with Big Data? If your company is just starting to consider using Big Data in you marketing research, what would be most useful to include? Explain in Data Science perspective. [10]
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(3 hours)

Total Marks: 80

Please check whether you have got the right question paper.

- N.B. 1. Question No. 1 is **compulsory**
 2. Attempt any **Three** out of remaining
 3. Assume suitable data if **necessary** and **justify** the assumptions
 4. Figures to the **right** indicate full marks

- Q1.** [A] Describe any two Fuzzy membership functions. **05**
 [B] Describe crossover points with example. **05**
 [C] Describe with example support, core, normality, crossover points, & α -cut for a fuzzy set. **05**
 [D] Describe Single Discrete Perceptron training Algorithm (SDPTA). **05**
- Q2** [A] Describe Perceptron Learning rule with an example. **10**
 [B] Describe any five defuzzification methods with example. **10**
- Q3** [A] Describe Binary SVM in brief. **10**
 [B] Perform two training steps using the delta learning rule for $\lambda = 1$ and $c = 0.25$. **10**
 Train the network using the following data pairs
- $$\left(x_1 = \begin{bmatrix} 2 \\ 0 \\ -1 \end{bmatrix}, d_1 = -1 \right), \quad \left(x_2 = \begin{bmatrix} 1 \\ -2 \\ -1 \end{bmatrix}, d_2 = 1 \right),$$
- The initial weights are $w_1 = [-1 \ 1 \ 0]^t$.
- Q4** [A] Explain with example max-min composition and max-product composition. **10**
 [B] Describe with example linearly separable and non-linearly separable pattern classification. **10**
- Q5** [A] Describe in brief Natural Immune System. **10**
 [B] Demonstrate Genetics algorithm with example. **10**
- Q6** Describe the methods (**any two**) **20**
 a. Genetics Algorithm in game playing
 b. Color Recipe prediction- Single MLP approach.
 c. Single Solution Particle Swarm Optimization

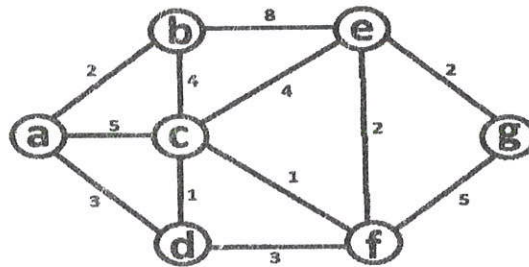
(3 Hours)

[Total Marks : 80]

Please check whether you have got the right question paper.

- N.B. (1) Question No. 1 is compulsory
 (2) Attempt any three out of remaining five questions
 (3) Assumptions made should be clearly stated
 (4) Figures to the right indicate full marks
 (5) Assume suitable data whenever required but justify that.

- Q.1 (a) Explain recurrences and Various methods to solve it. 5
 (b) Explain Amortized analysis with example 5
 (c) Explain NP-Complete problems 5
 (d) Explain Knuth-Morris-Pratt algorithm in detail. 5
 Q.2 (a) Solve MCM for following order $\langle 35, 10, 5, 30, 20, 15 \rangle$ 10
 (b) Explain Jarvis March algorithm in detail 10
 Q.3 (a) Prove that Subset sum is NP-Complete 10
 (b) Determine an LCS of "ABCABDACCB" and "BACACDB". 10
 Q.4 (a) Explain with example maximum bipertite matching using Ford Fulkerson 10
 (b) Apply Dijkstra algorithm on given graph 10



- Q.5 (a) Explain Huffman Coding algorithm with greedy strategy. 10
 (b) Explain how Divide and Conquer is applied for finding closest pair of points 10
 Q.6 Write short note on following 20
 (a) Line segment properties
 (b) Randomized algorithm
 (c) Elements of dynamic programming
 (d) TSP as a NP Complete Problem

(Time Duration: 3hrs)

(Marks: 80)

1. Question No 1 is compulsory.
2. Attempt any three out of the remaining five questions.

- Q1. (a) How can a network effectively and fairly allocate its resources? **05**
(b) Explain the concept of additive increase mechanism of TCP **05**
(b) Define scalability, availability and reliability **05**
(d) What is hidden terminal and exposed terminal problem? **05**
- Q2. (a) Discuss best practices of campus area network design. **10**
(b) Explain the phases of the PPDIOO network life cycle. **10**
- Q3. (a) Compare the different IPv4 routing protocols **10**
(b) Explain multicast, unicast and anycast addresses in IPV6. **10**
- Q4. (a) What are the objectives of an effective WAN design? Describe the different WAN Link Categories and their characteristics. **10**
(b) What are the disadvantages of the binary exponential back off mechanism used in MACA? How are they overcome in MACAW? **10**
- Q5. (a) Explain dynamic source routing (DSR) protocol in detail along with its advantages and disadvantages. **10**
(b) Explain the role of DR and BDR in OSPF. How are the DR and BDR elected? **10**
- Q6. Write short notes on: (any two): **20**
- i) WAN transport technologies
 - ii) TCP congestion control mechanisms
 - iii) WLAN design
 - iv) Software Defined Networking.

Q.P.Code:18440

(3 Hours)

Total Marks: 80

Instructions: - 1) Question No 1 is compulsory; solve any 3 questions from remaining 5 questions.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

- Q 1 a) Explain cryptographic applications. (05)
b) Explain Internet of Things- driver for digital business. (05)
c) Explain HTTP (05)
d) Explain SSL. (05)
- Q 2) a) Explain Different types of cryptography with suitable example. (10)
b) Explain opportunities and challenges in digital business with current status of digital business. (10)
- Q 3) a) Explain E-Supply chain with suitable example. (10)
b) Explain ERP with its use as backbone in E-Commerce. (10)
- Q4) a) Explain general template for business plan preparation. (10)
b) Explain various drivers in digital business. (10)
- Q 5) a) Explain selling and buying in private e-markets with respect to business to business E-Commerce. (10)
b) Explain Digital signatures and certificates. (10)
- Q 6) Write short notes on (Any two). (20)
- i) Physical and digital economy
ii) Firewall
iii) E-Business strategy.
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