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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (Sem.-3)
E-COMMERCE AND DIGITAL MARKETING

Subject Code : PGCA-1921

M.Code : 90807

Date of Examination : 03-01-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION - B & C. have **FOUR** questions each.
3. Attempt any **FIVE** questions from SECTION B & C carrying **TEN** marks each.
4. Select atleast **TWO** questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- a) What do you understand by the term E-Commerce?
- b) What do you understand by Internet service provider and World Wide Web?
- c) What is electronic fund transfer?
- d) What is EDI?
- e) How EDI software implementation is done?
- f) What is affiliate marketing, give examples?
- g) Explain affiliate and influencer marketing with the help of examples.
- h) What is search engine optimization?
- i) What do you understand by web analytics? How e- mail marketing is done?
- j) What is social media marketing?

SECTION-B

2. What are the technical components of the E-commerce? How E-commerce has helped Indian business to expand?
3. How smart cards have helped in digitalization of Indian economy? What are the risks involved in the electronic payment system?
4. What is the application of EDI in business? What are the legal issues involved in it?
5. How successful is e-governance in India? What is the security, issues involved?

SECTION-C

6. What are the various components of the online marketing and the impact of online marketing on business?
7. What is the role and importance of internet and search engine optimization? What is SEM?
8. How social media marketing is becoming a major tool of marketing in digital marketing? What in on page optimization and off page optimization?
9. How a successful content marketing strategy can be made and implemented?



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Total No. of Pages : 02

MCA (Sem.-3)

THEORY OF COMPUTATION

Subject Code : PGCA 1927

M.Code : 90800

Date of Examination : 21-12-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- a) CFG.
- b) Explain tractable problems with example
- c) How will explain Russels's paradox?
- d) Discuss about Moore machine.
- e) Differentiate PDA and NPDA.
- f) Explain steps for simplification of CFG.
- g) Define halting problem.
- h) What is the unrestricted grammar?
- i) How to perform lexical analysis?
- j) Explain the parse tree representation.

1 | M-90800

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SECTION-B

2. Explain DFA. Construct finite automata equivalent to the following regular expressions (step by step): $((0+1)(0+1))^* + ((0+1)(0+1)(0+1))^*$
3. Explain Pumping Lemma. Prove that the language $L = \{w \in \{a, b\}^* \mid w = w^R\}$ is not regular grammar.
4. What is CNF? Convert the following grammars to Chomsky Normal Form:
 $S \rightarrow ASB, A \rightarrow aASA \mid a \mid \epsilon, B \rightarrow SbS \mid A \mid bb$
5. Explain Regular grammar. Consider the language $L = \{w \in (a, b)^* : w \text{ has an odd number of } a\text{'s}\}$. Write a regular grammar for L . Use that grammar to derive a (possibly non-deterministic) FSA to accept L .

SECTION-C

6. What is the significance of Turing machine? Design and explain step by step, Turing Machine for computing "Concatenate two strings w_1 and w_2 , where each string is generated over $\{1, b\}$ "
7. What is ambiguity in PDA? Write the Instantaneous descriptions and design PDA which recognizes the set of strings over $\{a, b\}$ where string length is odd and its middle symbol is a 'b'.
8. What is Post Correspondence Problem? How reduction works in the structure of undecidability proof? Design an instance and match of PCP to explore that the lists $M = (ab, bab, bbaaa)$ and $N = (a, ba, bab)$ include a Post Correspondence Solution?
9. Write short notes on the list given below:
 - a) Chomsky Hierarchy of languages
 - b) CSL.

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2 | M-90800

(51)-1046

Total No. of Questions : 09

Total No. of Pages : 02

MCA (Sem.-3)

ARTIFICIAL INTELLIGENCE & SOFT COMPUTING
Subject Code : BCCA1005

Subject Code : PGCA1926

M.Code : 90799

Date of Examination : 19-12-2022

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :
- a) What is artificial Intelligence?
 - b) Define neuron.
 - c) Define First Order Logic.
 - d) What is a Clause?
 - e) What is the best way to go for Game playing problem?
 - f) How do you represent "*All dogs have tails*"?
 - g) What is top-down parsing?
 - h) Define Supervised Learning Networks.
 - i) Define Activation Function.
 - j) Define Fuzzy Control Systems.

SECTION-B

2. What do you mean by Water Jug problem? Explain with its space search.
3. What is forward chaining and backward chaining in AI explain in details?
4. What do you mean by Heuristic Search? Discuss Memory bounded heuristic Search in detail by taking suitable example.
5. What is semantic analysis and pragmatics? Discuss with examples.

SECTION-C

6. Derive output equations and weight update equations for a multilayer feed forward neural network using back propagation algorithm.
7. Explain crisp and fuzzy implication rules.
8. Explain about the basic operations and technologies in genetic algorithms.
9. Explain the concept of associative memory in ANN. List its types.



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SECTION-B

2. Differentiate DFA and NDFA. Construct a finite automata a set and write the language :
- $\{W \in \{a, b\}^*: \text{number of } a\text{'s is a multiple of 3 and number of } b\text{'s is even.}\}$**
3. Explain regular expression. Write a regular expression for all words over $\{a, b\}$ that have
- At least one 'a' and one 'b'
 - 'a' appears in integer multiple of 3(three) if it appears.
 - With exactly two 'a's OR two 'b's.
4. State Pumping lemma and prove that the language $L = \{a^n b^k c^{n+k} : n \geq 0, k \geq 0\}$ is not regular.
5. Convert the following CFG into Greibach normal form :
- $A_1 \rightarrow A_2 A_3, \quad A_2 \rightarrow A_3 A_1, \quad A_2 \rightarrow b, \quad A_3 \rightarrow A_1 A_2, \quad A_3 \rightarrow a$

SECTION-C

6. Design a Turing Machine (single tap double track) for computing the following function :
- | | |
|---------------|------------|
| $F(x, y) = x$ | if $x > y$ |
| $= y$ | if $x < y$ |
| $= 2 * x$ | if $x = y$ |
7. Explain PDA. Consider grammar G whose production rules are :
- $S \rightarrow 0B|1A$
- $A \rightarrow 0|0S|1AA$
- $B \rightarrow 1|1S|0BB.$
8. What was the Chomsky's classification of grammars (write general form of productions only, with an example of each class)?
9. Write short notes on the list given below :
- PCP
 - Recursive and RE language.

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MCA (Sem.-3)

ARTIFICIAL INTELLIGENCE & SOFT COMPUTING

Subject Code : PGCA1926

M.Code : 90799

Date of Examination : 03-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :
 - a) Define Intelligence.
 - b) What is Soft Computing?
 - c) Differentiate between Horn Clauses and Definite Clauses.
 - d) How do you represent "*All dogs have tails*"?
 - e) Define Parsing.
 - f) What is Resolution? Briefly explain the resolution principle.
 - g) What is grammar? Is it possible to extract meaning of a sentence without using grammatical facts?
 - h) Define Defuzzification.
 - i) What do you mean by Multilevel Optimization?
 - j) Define Unsupervised Learning Networks.

SECTION-B

- 2) Discuss 8-Queens problem in detail. How many solutions does 8 queen problem have?
- 3) Differentiate between Forward and Backward Chaining in detail.
- 4) What do you mean by Heuristic Search? Discuss Greedy best-search in detail by taking suitable example.
- 5) What is semantic analysis and pragmatics? Discuss with examples.

SECTION-C

- 6) Differentiate between Hard and soft Computing. Discuss major application areas of Soft Computing.
- 7) Differentiate between single layer and multilayer perceptron. Discuss back propagation network Architecture.
- 8) What are the basic components of a fuzzy logic system? Explain each of them in detail.
- 9) Explain in detail about various operators of GA and also explain GA evaluation procedure.

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Total No. of Questions : 09

MCA (Sem.-3)

ADVANCED COMPUTER NETWORKING

Subject Code : PGCA-1925

M.Code : 90798

Date of Examination : 01-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION - B & C. have **FOUR** questions each.
3. Attempt any **FIVE** questions from SECTION B & C carrying **TEN** marks each.
4. Select atleast **TWO** questions from SECTION - B & C.

SECTION-A

- 1) Write short notes on :
- a) What are the issues in seamless mobility in mobile networks?
 - b) What do you mean by frequency reuse in cellular networks?
 - c) What is the need of a routing algorithm?
 - d) Define attenuation and distortion in data communication.
 - e) What are the benefits of a layered architecture in computer networks?
 - f) What is static channel allocation at MAC layer?
 - g) List various design issues at network layer.
 - h) What is IPv4 address?
 - i) What are the causes of interference in wireless systems?
 - j) What is FTP?

SECTION-B

- 2) Explain the OSI model in detail and discuss functionality of each layer.
- 3) What do you mean by sliding window protocol? Illustrate the difference between Stop & Wait ARQ protocol and Go-back-N ARQ protocol at data link layer with an example.
- 4) Discuss various types of transmission media used for data communication in computer networks.
- 5) What are the causes of congestion in a computer network? Explain various congestion control techniques with suitable example.

SECTION-C

- 6) List and explain the features provided in IEEE 802.11 standard. Discuss the suitability of each feature with respect to mobile networks.
- 7) Discuss the evolution of wireless communication systems. What are the new functionalities supported by 5G as compared to 4G technology?
- 8) Explain the working of any routing protocol used in adhoc networks. Use suitable example for illustration of the routing protocol.
- 9) Write short notes on :
 - a. Cellular Network
 - b. Handoff strategies in wireless systems.

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Total No. of Questions : 09

MCA (Sem.-3)

DATA MINING AND BUSINESS INTELLIGENCE

Subject Code : PGCA-1972

M.Code : 90803

Date of Examination : 10-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION - B & C. have **FOUR** questions each.
3. Attempt any **FIVE** questions from SECTION B & C carrying **TEN** marks each.
4. Select atleast **TWO** questions from SECTION - B & C.

SECTION-A

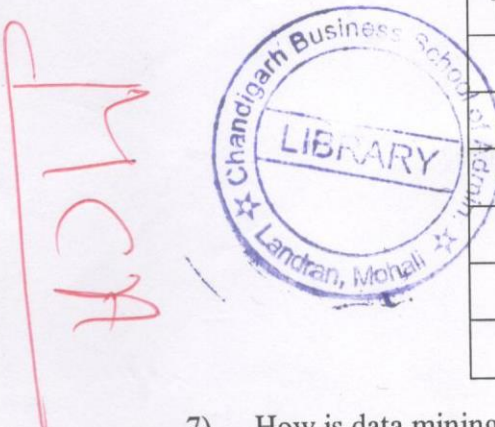
- 1) **Write short notes on :**
- What is the difference between a database and data warehouse?
 - Draw a star scheme by taking a suitable example.
 - Briefly describe the concept of data compression.
 - Mention the broader steps of data pre-processing.
 - Identify the relationship between OLAP and OLTP.
 - What is spatial mining and web mining?
 - Name few applications of data mining for business intelligence.
 - What is linear and non-linear regression method for prediction?
 - Which properties are important for frequent itemset mining?
 - What is CART? List down its advantages.

SECTION-B

- 2) Describe the BI process and technology along with its roles and responsibilities.
- 3) Explain the steps of data preprocessing and describe the ways to handle missing or noisy data.
- 4) Explain the dimensional analysis approaches: Drill-down and Roll-up, slice and dice or rotation.
- 5) Discuss the importance of dimensionality reduction. Explain the technique of Principal Component Analysis (PCA) in detail.

SECTION-C

- 6) Trace the results of using the Apriori algorithm on the grocery store example with support threshold, $s = 33.34\%$ and confidence threshold, $c = 60\%$. Show the candidate and frequent itemsets for each database scan. Enumerate all the final frequent itemsets.



Transaction ID	Items
T1	HotDogs, Buns, Ketchup
T2	HotDogs, Buns
T3	HotDogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	HotDogs, Coke, Chips

- 7) How is data mining beneficial for market segmentation and for retail industry? Justify.
- 8) Explain in detail the Hadoop architecture and working of Map and Reduce phases.
- 9) Write short notes on the following :
 - a) K-means clustering
 - b) Logistic regression.

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21

Total No

Pages : 01

MOBILE APPLICATIONS DEVELOPMENT

M.Code : 90805

Date of Examination : 17-02-22

Max. Marks : 70

1. Attempt any FIVE question(s), each question carries 14 marks.

1. Describe the characteristics, framework and tools of mobile development.
2. Define interface and layouts. Explain the designing of user interface in mobile applications.
3. Explain in detail service life cycle.
4. Discuss the process of handling data in mobile apps. Explain different types of database used in mobile.
5. Discuss the directory structure of an Android Project.
6. What are open platforms? Explain the working and use of mobile operating systems.
7. Make an application to illustrate the use Seekbar and Progressbar.
8. Explain the architecture of iOS and advanced iphone styling.

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20

Total No. of Pages : 02

MCA (Sem.-3)

Subject Code : PGCA1926

M.Code : 90799

Time : 2 Hrs.

Max. Marks : 70

1. Attempt any FIVE question(s), each question carries 14 marks.

1.
 - a) Define intelligence. What is the intelligent behavior of a machine?
 - b) What are weak methods? Identify the main difficulties that led to the disillusion with AI in the early 1970s.
2.
 - a) Describe the forward chaining inference process. Give an example.
 - b) List problems for which the forward chaining inference technique is appropriate. Why is backward chaining used for diagnostic problems?
3. Provide a definition of the word "heuristic." In what ways can heuristics be useful in search? Name three ways in which you use heuristics in your everyday life.
4. How does an artificial neural network model the brain? Describe two major classes of learning paradigms: supervised learning and unsupervised (self-organised) learning. What are the features that distinguish these two paradigms from each other?
5.
 - a) What is Soft Computing? What is the difference between Hard and Soft computing?
 - b) Briefly discuss the applications of Soft Computing.
6. What are a fuzzy set and a membership function? What is the difference between a crisp set and a fuzzy set? Determine possible fuzzy sets on the universe of discourse for man weights.
7. What are the main steps of a genetic algorithm? Draw a flowchart that implements these steps. What are termination criteria used in genetic algorithms?
8. Explain what is meant by Natural Language Processing. Explain the role of each of the following in Natural Language Processing: morphology, syntax, semantics, pragmatics, and grammar.

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