

22643

M. Tech. 2nd Semester (CSE) CBCS Scheme

Examination, May-2026

Soft Computing

Paper : MTCSE22C1

Time allowed : 3 Hours]

[Maximum marks : 100

Note : Question No. 1 is compulsory. Attempt four more questions selecting one question from each unit.

All questions carry equal marks.

1. Compulsory Question :

- (a) What briefly describe the historical development of Artificial Neural Networks (ANNs)?
- (b) What is the role of activation functions in mathematical neuron models?
- (c) What is the difference between classical sets and fuzzy sets?
- (d) Define a membership function with a suitable example.
- (e) Define fuzzy numbers and give on real-life example.

- (f) What is linguistic variables in fuzzy systems?
- (g) What is the relationship between information and uncertainty?
- (h) Define nonspecificity of crisp sets with an example.

Unit-I

- 2. Discuss the Backpropagation algorithm for training a multiplayer perceptron. Use a flow diagram to illustrate.
- 3. Derive and describe the gradient descent algorithm in detail. Explain its role in ANN training.

Unit-II

- 4. Explain the concept of fuzzy sets how is it different from classical set? Explain the help of suitable real-life examples.
- 5. Discuss in detail the operations on fuzzy sets (complement, union, intersection and aggregation) by taking a suitable example.

Unit-III

- 6. Explain the concept of fuzzy arithmetic and describe how arithmetic operations are performed on fuzzy numbers.

7. Discuss the lattice of fuzzy numbers with examples.

Unit-IV

8. Discuss the role of uncertainty in information systems. Explain how it is handled in fuzzy set theory.
9. Explain the nonspecificity of fuzzy and crisp sets with suitable examples.

M. Tech 2nd Semester (CSE) CBCS

Scheme Examination, May-2026

Algorithm Design

Paper : MTCSE22C2

Time allowed : 3 Hours]

[Maximum marks : 100

Note: *All questions carry equal marks. Question No. 1 is compulsory. In addition to the compulsory questions, students will have to attempt four more questions, selecting one question from each unit.*

1. Compulsory Question

- (a) Define recurrence equations and give an example.
- (b) What are priority queues with decrease key operations?
- (c) What is the optimal binary search tree problem?
- (d) Write a short note on job sequencing with deadlines.
- (e) Define NP-complete problems.
- (f) What is an approximate string matching technique?
- (g) What is parallelism in computing?
- (h) Define epsilon (ϵ) approximations.

2. Explain the performance analysis of algorithms with respect to space and time complexity and growth of functions.
3. Describe the divide and conquer approach with examples and solve a recurrence equation using it.

Unit-II

4. Explain the general greedy method and solve the knapsack problem using it.
5. Describe the dynamic programming approach for the all-pairs shortest path problem.

Unit-III

6. Explain NP-hard and NP-complete problems with suitable examples.
7. State and explain Cook's Theorem and its significance in computational complexity.

Unit-IV

8. Explain the PRAM model and describe some simple PRAM algorithms.
9. Discuss handling write conflicts in parallel algorithms with suitable techniques.

22645

**M.Tech. 2nd Semester (CSE) CBCS Scheme (Elective-I)
Examination, May-2026**

**MOBILE AND WIRELESS COMMUNICATION
Paper-MTCSE22D1**

Time allowed : 3 hours]

[Maximum marks : 100

Note : All questions carry equal marks. Question No. 1 is compulsory. In addition to the compulsory question, students will have to attempt four more questions, selecting one question from each unit.

1. Compulsory Question :

- (i) Write a short note on CDMA and how it differs from FDMA and TDMA.
- (ii) What is polling inhibit sense multiple access ?
- (iii) Mention two key functions of the MAC management layer in WLAN.
- (iv) What is the role of link management in Bluetooth technology ?
- (v) Differentiate between dynamic source routing and destination-sequence distance vector routing.
- (vi) What are metrics in routing algorithms ?
- (vii) What is the purpose of WWW-HIT and HTML in mobile system architecture ?
- (viii) Name any two telephony applications supported by wireless networks.

Unit-I

2. Explain SDMA, FDMA, TDMA (Fixed TDM), and how classical ALOHA and slotted ALOHA protocols work.
3. Describe the architecture of mobile services, protocols, handover process, security challenges, and new data services.

Unit-II

4. Explain the IEEE 802.11 wireless LAN system architecture, protocol architecture, and MAC layer management.
5. Discuss Bluetooth technology, including user scenarios, physical and MAC layers, networking and security.

Unit-III

6. Describe the purpose and functioning of DHCP in mobile environments.
7. Explain routing algorithms in Adhoc networks : Destination Sequence Distance Vector (DSDV), Dynamic Source Routing (DSR) and hierarchical algorithms.

Unit-IV

8. Explain transaction-oriented TCP and its advantages for mobile computing.
9. Discuss WAP architecture, wireless datagram protocol, wireless transport layer security, and wireless transaction protocol.

Roll No.

97550

**Open Elective Course 2nd Semester
(CBCS Scheme) (Re-appear Only)
Examination – May, 2026**

CYBER FORENSIC AND SECURITY

Paper : 16CSA01

Time : Three Hours]

[Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

प्रश्नों के उत्तर देने से पहले परीक्षार्थी यह सुनिश्चित कर लें कि उनको पूर्ण एवं सही प्रश्न-पत्र मिला है। परीक्षा के उपरान्त इस संबंध में कोई भी शिकायत नहीं सुनी जायेगी।

Note : Attempt *five* questions in all. Question No. 1 is *compulsory*. Attempt *four* more questions by selecting *one* question from each Unit. All questions carry equal marks.

कुल पाँच प्रश्नों के उत्तर दीजिए। प्रश्न संख्या 1 अनिवार्य है। प्रत्येक इकाई से एक प्रश्न चुनकर, चार अन्य प्रश्नों के उत्तर दीजिए। सभी प्रश्नों के अंक समान हैं।

1. (a) Who are cyber security professionals ? $2 \times 8 = 16$
साइबर सुरक्षा पेशेवर कौन होते हैं ?
- (b) How does ethical hacking contribute to improving security measures ?
सुरक्षा उपायों को बेहतर बनाने में एथिकल हैकिंग किस प्रकार योगदान देती है ?
- (c) What is Cyber Security ?
साइबर सुरक्षा क्या है ?
- (d) What are the common types of cyber threats ?
साइबर खतरों के सामान्य प्रकार कौन-से हैं ?
- (e) What are the implications of the Privacy Act in digital forensics ?
डिजिटल फोरेंसिक में गोपनीयता अधिनियम के क्या निहितार्थ हैं ?
- (f) What is meant by digital investigation ?
डिजिटल जांच से क्या तात्पर्य है ?
- (g) How do malware and spyware differ ?
मालवेयर और स्पाइवेयर में क्या अंतर है ?
- (h) How ISO standards help in cyber security ?
साइबर सुरक्षा में ISO मानक किस प्रकार सहायता करते हैं ?

UNIT – I

इकाई – I

2. (a) What is the need for information security ? How it addresses the key threats to information systems ? Explain. 8

सूचना सुरक्षा की क्या आवश्यकता है ? यह सूचना प्रणालियों के लिए प्रमुख खतरों का समाधान किस प्रकार करती है ? समझाइए।

- (b) What are the different types of Information Systems ? How does information security play a role in protecting these systems ? Explain. 8

सूचना प्रणालियों के विभिन्न प्रकार कौन-से हैं ? इन प्रणालियों की सुरक्षा करने में सूचना सुरक्षा की क्या भूमिका है ? समझाइए।

3. (a) What are the common sources and motives behind security threats to Information Systems ? Explain. 8

सूचना प्रणालियों के लिए सुरक्षा खतरों के पीछे सामान्य स्रोत और उद्देश्य क्या हैं ? समझाइए।

- (b) Discuss how vulnerabilities in target assets can lead to consequences such as cyber-crimes, including email and web threats. 8

चर्चा कीजिए कि लक्षित संपत्तियों में मौजूद कमजोरियां किस प्रकार साइबर-अपराधों (जिनमें ईमेल और वेब संबंधी खतरे शामिल हैं) जैसे परिणामों का कारण बन सकती हैं।

UNIT - II

इकाई - II

4. (a) What do you mean by cyber forensics investigations ? How does Internet tracing help in this process ? Explain. 8

साइबर फोरेंसिक जांच से आप क्या समझते हैं ? इस प्रक्रिया में इंटरनेट ट्रेसिंग किस प्रकार सहायता करती है ? समझाइए।

- (b) What is the role of wireless technologies in cyber forensics ? Also outline the challenges they present in detecting and mitigating threats. 8

साइबर फोरेंसिक में वायरलेस तकनीकों की क्या भूमिका है ? साथ ही, खतरों का पता लगाने और उन्हें कम करने में इनके द्वारा प्रस्तुत चुनौतियों का भी उल्लेख कीजिए।

5. (a) What are the key principles of Cyber Security ?
How do they apply to protecting business
computer systems ? Explain. 8

साइबर सुरक्षा के प्रमुख सिद्धांत कौन-से हैं ? व्यावसायिक
कंप्यूटर प्रणालियों की सुरक्षा करने में ये सिद्धांत किस प्रकार लागू
होते हैं ? समझाइए।

- (b) What are biometric security systems ? How these
help prevent data from being compromised ?
Explain. 8

बायोमेट्रिक सुरक्षा प्रणालियां क्या हैं ? ये डेटा को खतरे से बचाने
में किस प्रकार सहायता करती हैं ? समझाइए।

UNIT – III

इकाई – III

6. (a) What are the main techniques used in ethical
hacking ? How do they differ when targeting
networks, web applications, and passwords ?
Explain. 8

एथिकल हैकिंग में उपयोग की जाने वाली मुख्य तकनीकें कौन-सी
हैं ? नेटवर्क, वेब अनुप्रयोगों और पासवर्ड को लक्षित करते समय
ये तकनीकें किस प्रकार भिन्न होती हैं ? समझाइए।

(b) What is the role of malware and scanning in hacking attempts ? How ethical hackers use these tools to expose vulnerabilities ? Explain. 8

हैकिंग के प्रयासों में मालवेयर और स्कैनिंग की क्या भूमिका है ?
एथिकल हैकर्स कमजोरियों का पता लगाने के लिए इन उपकरणों
का उपयोग किस प्रकार करते हैं ? समझाइए।

7. (a) Why is evidence collection critical in digital criminal investigations ? What challenges are faced in collecting digital evidence ? Explain. 8

डिजिटल आपराधिक जांचों में साक्ष्य (सबूत) एकत्र करना इतना
महत्वपूर्ण क्यों है ? डिजिटल सबूत इकट्ठा करने में किन चुनौतियों
का सामना करना पड़ता है ? समझाएँ।

(b) What is the importance of maintaining the chain of custody for digital evidence ? How investigators reconstruct cyber attacks using collected artifacts ? Explain. 8

डिजिटल सबूतों के लिए चेन ऑफ कस्टडी (सुरक्षा शृंखला) बनाए
रखने का क्या महत्व है ? जाँचकर्ता इकट्ठा किए गए आर्टिफैक्ट्स
(अवशेषों) का उपयोग करके साइबर हमलों को फिर से कैसे
तैयार करते हैं ? समझाएँ।

UNIT – IV

इकाई – IV

8. (a) How are cyber security standards ? How do these help in the management of cyber crimes and the protection of digital assets ? Explain. 8

साइबर सुरक्षा मानक क्या हैं ? ये साइबर अपराधों के प्रबंधन और डिजिटल संपत्तियों की सुरक्षा में कैसे मदद करते हैं ? समझाएँ।

- (b) What is the impact of Cyber Laws in India ? How do these help in safeguarding IPRs in cyberspace? Explain. 8

भारत में साइबर कानूनों का क्या प्रभाव है ? ये साइबरस्पेस में बौद्धिक संपदा अधिकारों (IPRs) की सुरक्षा में कैसे मदद करते हैं ? समझाएँ।

9. (a) What organizational roles are essential for effectively responding to cyber incidents ? What procedures should be followed during an incident response ? Explain. 8

साइबर घटनाओं पर प्रभावी ढंग से प्रतिक्रिया देने के लिए कौन-सी संगठनात्मक भूमिकाएँ आवश्यक हैं ? किसी घटना पर प्रतिक्रिया देते समय किन प्रक्रियाओं का पालन किया जाना चाहिए ? समझाएँ।

(b) What is the reporting procedures and legal considerations that organizations must keep in mind while handling cyber incidents ? Explain. 8

साइबर घटनाओं को संभालते समय संगठनों को रिपोर्टिंग की किन प्रक्रियाओं और कानूनी बातों को ध्यान में रखना चाहिए ? समझाएँ।

Roll No.

12030

**Foundation Elective 2nd Semester
Examination – May, 2026**

ENTREPRENEURSHIP DEVELOPMENT

Paper : 16IMSF1

Time : Three hours]

[Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : This paper consists of *two* Sections (Section A and B).

Section A is *compulsory* and carrying questions of one marks each and Section B consists of eight questions. The students shall be required to attempt *four* questions from Section B, selecting *one* question from each Unit. All questions carry equal marks.

SECTION – A

1. (a) Entrepreneurial Traits

(b) Debt financing

- (c) Franchising
- (d) Venture capital
- (e) Environmental Scanning
- (f) Market feasibility
- (g) IPR
- (h) Working capital

SECTION – B

UNIT – I

2. Explain the concept of Entrepreneurship. Discuss various traits essential for a successful entrepreneur.
3. Discuss the process of Entrepreneurship in detail with suitable example.

UNIT – II

4. Explain the whole process of starting a new business venture.
5. What types of risk involved in stating new business venture and how will you do feasibility analysis for a new business idea ?

UNIT – III

6. Compare the different form of ownership and explain the factors should be considered when designing an organizational structure.

7. Write short notes :

- (a) Contingency planning
- (b) Cash budget

UNIT – IV

8. Discuss in detail various source of finance for new venture and factors which influence the selection of source.
9. What do you understand by intellectual property rights ? Highlight the benefits and challenge involved in IPR process.
-