Roll No. ..... Total Pages : 3

BT-4/M-26 **44223**

MATHEMATICS FOR INTELLIGENT SYSTEMS

Paper–PC-CS-CYS-202A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions by selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Factor the matrix into $A = LU$, where $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$. 7.5

(b) Find whether the set of vectors are linearly dependent or independent [1, 0, 0, 0], [1, 2, 0, 0], [1, 2, 3, 0], [1, 2, 0, 4]. 7.5

2. Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$. 15

UNIT–II

3. Let $x[n] = \delta[n] + 2\delta[n-1] - \delta[n-3]$ and $h[n] = 2\delta[n+1] + 2\delta[n-1]$. Compute and plot each of the following convolutions :

(a) $y[n] = x[n] * h[n]$.

(b) $y[n] = x[n+2] * h[n]$. 15

4. A resistance R of 5 Ω and an inductance L of 0.1 H are connected in series with a battery of 12 V. Find the current i in the circuit as a function of time using the following differential equation $Ri + L\frac{di}{dt} = E$. 15

UNIT–III

5. A particle falls under gravity in a resisting medium whose resistance varies with velocity. Find the relation between distance and velocity if initially the particle starts from rest. 15

6. (a) A condenser of capacity C is discharged through the inductance L and a resistance R in series and the charge q at any time t satisfies the equation $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = 0$.

Given that $L = 0.25$ henry, $R = 250$ ohms, $C = 2\times10^{-6}$ farad and that when $t = 0$, the charge q is 0.002 coulombs and the current $\frac{dq}{dt} = 0$, obtain the value of q in terms of t. 7.5

(b) Find the expansion of the function $f(x, y) = x^2y + 3y - 2$ in a Taylor's series in the neighbourhood of the point $(1, -2)$. 7.5

UNIT–IV

7. (a) An urn contains 10 black and 10 white balls. Find the probability of drawing two balls of the same colour. 7.5

(b) An urn I contains 3 white and 4 red balls and an urn II contains 5 white and 6 red balls. One ball is drawn at random from one of the urns and is found to be white. Find the probability that it was drawn from urn I. 7.5

8. (a) Define Binomial and Poisson distributions. 7.5

(b) Explain Monte Carlo simulations. 7.5

Roll No. ..... Total Pages : 2

BT-4/M-26 **44224**

OBJECT-ORIENTED PROGRAMMING SYSTEM

Paper–ES-CS-CYS-204A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each Unit.

UNIT–I

1. (a) Explain Encapsulation, Abstraction, Inheritance and Polymorphism with suitable C++ examples. (9)

(b) Differentiate between Structure and Class. Explain class scope and access specifiers with example. (6)

2. (a) Write a C++ program illustrating constructors, copy constructor and destructor. (8)

(b) Explain namespaces and header files in C++ with suitable examples. (7)

UNIT–II

3. (a) Explain dynamic memory allocation using new and delete operators with example program. (8)

(b) Explain friend function and friend class with suitable program. (7)

4. (a) Describe different types of inheritance with diagrams and examples. (7)

(b) Explain constructor execution order in derived classes. (8)

UNIT–III

5. (a) Explain compile-time and run-time polymorphism with examples. (8)

   (b) Write a C++ program to overload unary and binary operators. (7)

6. (a) Explain virtual functions, pure virtual functions and abstract base classes. (7)

   (b) Explain dynamic binding using base class pointer with example. (8)

UNIT–IV

7. (a) Explain text and binary file handling in C++ with suitable example program. (8)

   (b) Explain exception handling using try, throw and catch blocks. (7)

8. (a) Write a C++ program demonstrating function templates and class templates. (8)

   (b) Explain multiple catch statements and rethrowing exceptions. (7)

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BT-4/M-26 **44225**

DATABASE MANAGEMENT SYSTEMS

Paper– PC-CS-CYS-206A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions by selecting at least *one* question from each unit.

UNIT–I

1. (a) Explain Specialization and generalization in ER diagram. 8

   (b) Discuss various data models use in DBMS. 7

2. (a) Explain mapping constraints and weak entity set with example. 8

   (b) Discuss the role of various languages used in DBMS. 7

UNIT–II

3. (a) Explain any 2 join operations of relational algebra with example. 8

   (b) What do you mean by views? How are views created and dropped? 7

4. Write short notes on :

   (a) DCL Commands.

   (b) DDL Commands. (7½×2=15

UNIT–III

5. What is normalization? Explain 4th, 5th and BCNL normalization with example. 15

6. (a) Discuss different anomalies in designing database. 7

   (b) What are functional dependencies? Discuss the role of various factors related to functional dependencies. 8

UNIT–IV

7. Write short note on :

   (a) Transaction model properties.

   (b) Locking system with lock modes. (7½×2=15)

8. (a) Discuss various Deadlock handling techniques. 8

   (b) What are serial and serializable schedules? Give example. 7

Roll No. ..... Total Pages : 2

44226

BT-4/M-26

INTERNET AND WEB TECHNOLOGY

Paper–ES-CS-CYS-208A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each Unit.

UNIT–I

1. (a) Explain the role of Information Architecture in web design. Discuss navigation systems and site organization. (9)

   (b) Explain different types of navigation systems used in web applications. (6)

2. (a) Discuss high level architecture blueprint and architectural page mockups with example. (8)

   (b) Explain searching systems and indexing strategies used in websites. (7)

UNIT–II

3. (a) Explain XHTML document structure and syntax with example. (8)

   (b) Explain hyperlinks, lists and tables in HTML5 with suitable examples. (7)

4. (a) Explain Cascading Style Sheets and different levels of style sheets with examples. (7)

   (b) Discuss box model, font properties and color properties in CSS. (8)

UNIT–III

5. (a) Explain JavaScript primitives, operators and expressions with example. (8)

   (b) Write a JavaScript program demonstrating object creation and modification. (7)

6. (a) Explain arrays and functions in JavaScript with suitable examples. (7)

   (b) Explain pattern matching using regular expressions in JavaScript. (8)

UNIT–IV

7. (a) Explain Python data types and control statements with examples. (8)

   (b) Write a Python program using functions and dictionaries. (7)

8. (a) Explain object oriented programming concepts in Python. (8)

   (b) Discuss handling of text files in Python with example. (7)

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44227

BT-4/M-26

OPERATING SYSTEM

Paper–PC-CS-CYS-210A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all by selecting at least *one* question form each unit. All questions carry equal marks.

UNIT–I

1. (a) Define an operating system and its main functions. (7)

(b) Explain various types of operating systems with examples. (8)

2. (a) Explain the different structures of operating systems with diagrams. (8)

(b) Explain system calls in detail with categories and examples. (7)

UNIT–II

3. (a) Explain CPU Scheduling in an Operating System. Discuss different CPU scheduling algorithms. (8)

(b) Consider the following processes : (7)

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Roll No. ..... Total Pages : 2

BT-4/M-26 **44228**

CRYPTOGRAPHIC FUNDAMENTALS

Paper–PC-CS-CYS-212A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit.

UNIT–I

1. (a) Define Cryptography. Explain security attacks, services and mechanisms with suitable examples. (7)

   (b) Describe the Conventional Encryption model. Explain classical encryption techniques-substitution and transposition ciphers with examples. (8)

2. (a) Explain the Feistal structure and Shannon's theory of confusion and diffusion. How are they used in modern block ciphers? (8)

   (b) Describe the Data Encryption Standard (DES). Discuss the strength of DES and its differential and linear cryptanalysis. (7)

UNIT–II

3. (a) Explain the principles of Public Key Cryptography. Describe the RSA algorithm with a suitable example and discuss its security. (8)

   (b) Explain Diffie-Hellman Key Exchange algorithm. Also give an introductory idea of Elliptic Curve Cryptography. (7)

4. Explain the following in context of Integrity Checks and Authentication :

   (a) MD5 Message Digest Algorithm.

   (b) Secure Hash Algorithm (SHA).

   (c) Digital Signature Standards (DSS) and proof of digital signature algorithm.

   (d) Authentication Applications: Kerberos and X.509 (15)

UNIT–III

5. Discuss the concept of Public Key Infrastructure (PKI) and Internet Security Protocols. Explain various Internet Security Protocols with suitable examples. (15)

6. Explain Database Security in detail. Discuss data management technologies, information security, security policies and multi-level relational data models. (15)

UNIT–IV

7. Define Intrusion Detection. Explain the security concepts involved in Intrusion Detection, determining strategies for Intrusion Detection, and Vulnerability Analysis. (15)

8. Write a detailed note on the following in context of Intrusion Detection :

   (a) Credentialed Approaches.

   (b) Responses to Intrusion.

   (c) Technical Issues in Intrusion Detection Systems. (15)

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Roll No. ..... Total Pages : 02

BT-6/M-26 46298

MOBILE SECURITY

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss SIM card security mechanisms and possible SIM-based attacks. **8**

(b) Describe basic cryptographic techniques used in mobile security. **7**

2. (a) How is mobile network different from other networks ? Write about the components of mobile data network. **7**

(b) Explain the process of forensic investigation of mobile malware on a mobile device. **8**

Unit II

3. (a) Explain the evolution and architecture of Android OS. **7**

(b) Discuss Android ROM and boot loaders. **8**

4. (a) Explain corporate mobile security policies and Android development security strategies. 7

(b) Compare logical and physical acquisition of Android devices. 8

Unit III

5. Discuss HFS Plus file system and disk layout. 15

6. (a) Describe common application forensic analysis in Windows phones. 7

(b) Explain the internal architecture of iOS devices. 8

Unit IV

7. (a) Explain Malware attack and Defense mechanisms. 8

(b) Explain dynamic software analysis in mobile malware investigation. 7

8. Discuss the various steps involved in forensic investigation of MM on a mobile device. 15

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BT-6/M-26 46300

CREATIVITY, INNOVATION AND ENTREPRENEURSHIP

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) How can social or ethical roots shape these dimensions and foster creative problem-solving in future cyber defenders ? 8

   (b) Explain the concept of Creative Cerebration. 7

2. (a) Explain the factors contributing to successful technological innovation. 8

   (b) What are the principles of creativity ? What are the four C's of creativity ? 7

Unit II

3. (a) Explain the entrepreneurial ecosystem and its components. 7

   (b) Describe the most crucial component of an entrepreneurial ecosystem in the Indian context. 8

4. What is Lean Start-up Approach ? Explain the concept and benefits of Lean Start-up approach. 15

Unit III

5. (a) Discuss strategies to overcome fears related to creativity. 7

   (b) Discuss convergent thinking ability and its importance. 8

6. (a) Explain various types of creative blocks and strategies to unblock Motivation. 7

   (b) Draw and explain the Matrix depicting four types of creativity. 8

Unit IV

7. (a) Differentiate between Incremental and Radical Innovation. 8

   (b) Why is continuous innovation essential in cyber security product development ? 7

8. Discuss Resource Dependence and Knowledge Based theories. 15

Roll No. ..... Total Pages : 02

BT-6/M-26 46303

DIGITAL FORENSICS

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Explain the legal considerations involved in digital forensic investigations. 8

   (b) Compare command-line and GUI-based forensic tools. 7

2. What Legal considerations must be kept in mind during Digital Forensic Investigation Process ? 15

Unit II

3. (a) How Digital tools are used to analyze Network Traffic ? 7

   (b) Discuss the role of Live and Dead System Forensic Investigation. 8

4. (a) Discuss converting usable and unusable file formats in investigations. 7

   (b) Describe the Digital forensic process model. 8

Unit III

5. (a) Explain the role of Windows Registry and Event Logs in forensic analysis. **8**

   (b) Explain methods for finding deleted data. **7**

6. (a) Discuss Hibernation files and their forensic importance. **8**

   (b) Compare FAT and NTFS file systems. **7**

Unit IV

7. (a) Discuss challenges in investigating e-Mail fraud cases. **7**

   (b) Discuss web browser artifact analysis. **8**

8. (a) Explain the use of Internet resources in digital investigations. **8**

   (b) Discuss challenges in investigating social networking sites. **7**

Roll No. ..... Total Pages : 03

BT-6/M-26 46304

CRYPTANALYSIS

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *at least one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Explain classical cryptographic techniques. Compare substitution and transposition ciphers with suitable examples. Analyze their vulnerabilities using cryptanalysis. 8

   (b) Describe the secure communication model. Discuss security services and classify different types of attacks with examples. 7

2. (a) Explain X.800 Security Architecture for OSI model and its components. 8

   (b) Describe authentication protocols: Kerberos and X.509. Compare their working mechanisms. 7

Unit II

3. (a) Explain Euclidean and Extended Euclidean Algorithms. Solve for multiplicative inverse using an example. **8**

   (b) State and prove Fermat's Little Theorem and Euler's Theorem. Discuss their applications. **7**

4. (a) Explain prime number generation and Fast Exponentiation algorithm with examples. **8**

   (b) Explain Chinese Remainder Theorem. **7**

Unit III

5. (a) Explain symmetric key cryptography. Discuss DES structure and compare RC4, RC5, and Blowfish algorithms. **8**

   (b) Explain hash functions and message authentication codes. Discuss collision resistance with examples. **7**

6. (a) Explain RSA and ElGamal cryptosystems with algorithms. **8**

   (b) Discuss PKI, Digital Certificates and key management techniques. **7**

Unit IV

7. (a) Explain Diffie-Hellman key exchange. Analyze discrete logarithm problem. 8

   (b) Explain construction of finite fields with examples. 7

8. (a) Explain Elliptic Curve Cryptography (ECC) and its implementation. 8

   (b) Discuss RSA and Rabin cryptosystems with their security aspects. 7

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Roll No. ..... Total Pages : 02

BT-6/M-26 46305

INFORMATION THEORY AND CODING

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *Five* questions selecting at least *one* question from each Unit.

Unit I

1. Distinguish between Entropy and Conditional Entropy and also explain properties of Mutual Information. 15

2. What is difference between Shannon-Fano coding and Huffman coding schemes for data compaction. 15

Unit II

3. (a) Define a Cyclic Code and explain its algebraic structure.

   (b) Explain the role of a Generating Polynomial in the construction of cyclic codes. 15

4. Design a hardware Encoder for a cyclic code using shift registers based on a generator polynomial. 15

Unit III

5. Define the Minimum Distance of a code and explain its relationship to error-correcting capability. **15**

6. Identify the difference between error-detecting and Error-correcting codes. Justify by example. **15**

Unit IV

7. Compare the computational complexity of Viterbi decoding with simple tree searching. **15**

8. Construct a State Diagram and a Trellis Diagram for a given convolutional encoder. **15**

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Roll No. ..... Total Pages : 03

BT-6/M-26 46306

CLOUD SECURITY AND MANAGEMENT

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Explain the evolution of cloud computing from traditional distributed and grid computing. Discuss the major characteristics of cloud computing. 7

   (b) Describe the NIST cloud computing model and explain its core components with suitable diagrams. 8

2. Explain the architecture of cloud computing and compare it with traditional client–server architecture. Discuss the advantages and limitations of cloud computing. 15

Unit II

3. Explain virtualization in cloud computing. Discuss different types of virtualization such as hardware, storage, network and memory virtualization. **15**

4. (a) Differentiate between IaaS, PaaS and SaaS with suitable examples. **7**

   (b) Explain the cloud deployment models (public, private, hybrid and community cloud) and their practical applications. **8**

Unit III

5. Discuss the major security challenges in cloud computing. Explain, how infrastructure security, network security and application security are implemented in cloud environments. **15**

6. (a) Explain cloud information security objectives and security services in cloud environments. **7**

   (b) Discuss the issues related to data privacy, storage security and jurisdictional challenges in cloud computing. **8**

Unit IV

7. Discuss Service Level Agreements (SLA) in cloud computing. Explain their importance in service management and how SLAs ensure service reliability ? **15**

8. (a) Explain the concept of Identity and Access Management (IAM) in cloud computing. **7**

   (b) Discuss identity federation and identity provisioning in cloud systems. **8**

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CYS 7th / Library

Roll No. ..... Total Pages : 2

BT-7/M-26 **47407**

CYBER ATTACKS OWASP FRAMEWORK

Paper–PC-CS-CYS401A

Time : Three Hours] [Maximum Marks : 75

Note : Each Questions carry equal marks and attempt any *five* questions out of Eight Questions by selecting atleast *one* question from each Unit.

UNIT–I

1. What do you mean by Web Application Security (OWASP:A02:2021). Explain top 5 different application risk in OWASP. 15

2. What is Cryptographic Failure and why it happens in OWASP. Explain it in detail. 15

UNIT–II

3. Explain OWASP injection(OWASP A03:2021) and also write the reasons and dis-advantages of injection in OWASP. 15

4. What do you mean by Authorization and explain Data Access Authorization key points in detail with example. 15

UNIT–III

5. What do you mean by Cross Site Scripting(XSS) in OWASP. Explain the techniques to implement with the help of example 15

6. What are different ways to identify, detect and avoid the data from an untrusted source in OWASP. 15

UNIT–IV

7. What is local file inclusion and remote file inclusion . How to include and also write the risk associated with the file inclusion. 15

8. What do you mean by security misconfiguration. Explain the effect on security if vulnerable and outdated components is configured. 15

Roll No. ..... Total Pages : 2

BT-7/M-26 **47414**

INTRODUCTION TO CYBER LAWS

Paper–PE-CS-CYS-415A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions by selecting at least *one* question from each unit.

UNIT–I

1. (a) What are different kinds of cyber crime? 8

   (b) Define offence. What are different penalties imposed on different offences. 7

2. (a) What is IT act 2000? Discuss its important amendments. 7

   (b) Discuss various powers under IT act. 8

UNIT–II

3. (a) Define with example :

   (i) Cyber extortion.

   (ii) Logic bombs. (2×4=8)

   (b) Discuss various jurisdiction issues under IT Act. 7

4. (a) What is E-commerce? Discuss various laws related to E-commerce. 7

   (b) Discuss the working of digital signature. 8

UNIT–III

5. (a) Discuss various steps involved in patent application process. 7

   (a) How the sensitive information is classified? Discuss various laws related to sensitive information. 8

6. (a) Write short notes on "Cyber Law: An International Perspective". 7

   (b) What are different types of trademark? Discuss its important sections. 8

UNIT–IV

7. Write short notes on :

   (a) Free Speech.

   (b) Censorship in Cyberspace. (2×7½=15)

8. (a) Describe the role of various activities which are covered by the intellectual property rights. 7

   (b) Discuss privacy rights in cyber ethics. 8

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47419

BT-7/M-26

CLOUD SECURITY

Paper–PE-CS-CYS-425A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions by selecting atleast *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Explain the concept of Security by Design in AWS.

(b) Describe AWS Key Management Best Practices with examples. (7+8=15)

2. (a) Explain the structure of modern operating systems with examples.

(b) Discuss the importance of logging in AWS for security at scale. (7+8=15)

UNIT–II

3. (a) Explain any three common attacks on cloud infrastructure.

(b) Discuss SQL Injection and XSS attacks with examples. (7+8=15)

4. (a) What is DoS and DDoS attack?

(b) Explain countermeasures to protect cloud infrastructure from unauthorized access and misconfiguration. (7+8=15)

UNIT–III

5. (a) Explain the Cloud-Based Information Life Cycle.

   (b) Discuss data protection strategies for confidentiality and integrity. (7+8=15)

6. (a) Explain common attack vectors in cloud infrastructure.

   (b) Discuss important data protection laws of India related to data privacy. (7+8=15)

UNIT–IV

7. (a) What is proactive activity monitoring in cloud systems?

   (b) Explain how monitoring helps detect unauthorized access and malicious traffic. (7+8=15)

8. (a) What is intrusion detection in cloud security?

   (b) Discuss the importance of events and alerts in incident response. (7+8=15)

CYS 8th/ Library

Roll No. ..... Total Pages : 2

BT–8/M-26 **48413**

BLOCK CHAIN IN CYBER SECURITY

Paper–PC–CS–CYS–402A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) Explain hash function characteristics with examples. 8

   (b) Define blockchain. Explain its key features. 7

2. (a) Describe denial-of-service and man-in-the-middle attacks in blockchain. 8

   (b) Discuss the role of Digital signatures in blockchain security. 7

UNIT–II

3. (a) Write a short note on blockchain centralization and its Security issues. 7

   (b) Differentiate Proof of Work and Proof of Stake. 8

4. (a) Discuss common security attacks on smart contracts with examples. 7

(b) Explain blockchain vulnerabilities under network and consensus layers? 8

UNIT–III

5. (a) Elaborate risk measurement in blockchain? 7

(b) Discuss the CIA triad and AAA of security with blockchain applications. 8

6. (a) Evaluate blockchain Governance challenges. 7

(b) What is non-repudiation in blockchain? Give an example. 8

UNIT–IV

7. (a) Describe the process of compiling and deploying Solidity smart contracts with examples. 9

(b) What are function selectors in Solidity? Provide examples. 6

8. (a) Describe the working of Solidity language with its data types, storage, and memory concepts. 9

(b) Discuss the role of Solidity in blockchain applications and its limitations. 6

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BT–8/M-26 **48414**

ENTREPRENEURSHIP AND START-UPS

Paper–HSS–404A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. Analyze the role of Entrepreneurship in economic development, focusing on innovation, employment generation and regional development. Provide examples from India and abroad.

2. Discuss the challenges faced by Entrepreneurs in developing countries like India-such as regulatory hurdles, finance gaps and infrastructural issues-and suggest potential policy reforms.

UNIT–II

3. Define Design Thinking and explain its stages. How can this approach help entrepreneurs develop user-centric products and services?

4. Critically evaluate the statement: "Entrepreneurs are made, not born." Support your answer with examples and research-based arguments.

UNIT–III

5. Define Lean Start-ups and critically evaluate their methodology. How do they differ from traditional business planning approaches?

6. Analyze how minimum viable products (MVPs), iterative development and pivoting help start-ups reduce risks and improve product–market fit.

UNIT–IV

7. Analyze the contribution of state-level institutions in Entrepreneurship development. How do regional policies influence start-up ecosystems?

8. Examine how business incubators, accelerators and innovation hubs contribute to entrepreneurial development. Provide successful case studies.

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BT-8/M-26 48417

ARTIFICIAL INTELLIGENCE

Paper–OE–CS–CYS–406

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. Define Artificial intelligence. Explain various characteristics of Intelligence Agent. 15

2. Explain steps in problem solving in AI. Also explain advantages and challenges in AI Problem solving. 15

UNIT–II

3. Define and explain the Heuristic search in detail. Also discuss benefits and short comings of Heuristic search. 15

4. Explain how a Constraint Satisfaction Problem (CSP) may be solved? Also explain backtracking search with suitable example. 15

UNIT–III

5. Discuss various approaches and issues in Knowledge representation. Also discuss various Problems in Representing Knowledge. 15

6. (a) Explain Non monotonic reasoning with an example. 8

   (b) Explain with suitable examples how reasoning with default information works in AI? 7

UNIT–IV

7. (a) What is Natural Language Processing ? Explain working of NLP. 8

   (b) What is planning in AI ? Also explain applications of planning and moving in AI. 7

8. Explain Core components of Agent Argumentation. Also explain how agents use Argumentation and what are applications of Agent argumentation? 15

Roll No. ..... Total Pages : 2

BT–8/M-26 **48420**

PENETRATION TESTING

Paper–PE–CS–CYS–414A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. What are the main steps of Penetration testing? Illustrate the different types of Penetration test. 15

2. What is Pen testing? Explain different methodologies of Pen testing. 15

UNIT–II

3. How to use shodan to find vulnerable devices on the network? 15

4. What is Nmap and how to scan network with Nmap windows? 15

UNIT–III

5. What is Password cracking? Explain all techniques of Password cracking in detail. 15

6. What are the countermeasures to steganography? Discuss all techniques in detail. 15

UNIT–IV

7. How to identify, fix and prevent wi-fi hacks? Discuss in detail. 15

8. What is Penetration testing report? Explain key components of Penetration testing report. 15

Roll No. ..... Total Pages : 2

BT–8/M-26 48423

INTRUSION DETECTION AND PREVENTION

Paper–PE–CS–CYS–422A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) Define Intrusion Detection and Prevention Systems (IDPS). Explain any two common detection methodologies. 8

   (b) What are the key components of IDPS architecture? 7

2. Explain host-based and network-based IDPS with their applications. 15

UNIT–II

3. (a) What is Network Behaviour Analysis (NBA)? discuss its components. 8

(b) Write short notes on Honeynets (Gen I, II, and III). 7

4. (a) Explain the process of detecting intrusion using honeypots and network traffic capture. 8

(b) Explain the role of OpenCanary in honeypots deployment. 7

UNIT–III

5. Describe the working of Snort with MySQL in detail. 15

6. (a) Explain the need and importance of multiple IDS technologies in a Network. 8

(b) Define Snort rules and explain their role in intrusion detection. 7

UNIT–IV

7. (a) Explain WEP attacks with suitable examples. 7

(b) What is WPA cracking? How does it compromise Wireless networks? 8

8. Explain Wireless Honeypots and their role in detecting Wireless intrusions. 15