

Total No. of Questions : 4]

SEAT No. :

PE-5001

[Total No. of Pages : 2

[6507]-1

First Year B.Sc. (Cyber and Digital Science)

CDS-101 MJ : LINUX SYSTEM ADMINISTRATION

(2024 Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 30

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw the diagrams wherever necessary.*

Q1) Attempt any Six of the following :

[6 × 1 = 6]

- a) What is the root directory symbol in Linux?
- b) Name any one Linux distribution.
- c) What is disk partitioning? -
- d) What is a kernel in Linux?
- e) What is the purpose of PAM in Linux?
- f) What is the purpose of the cron service?
- g) Which command is used to list files in Linux?
- h) Write the command to copy a file?

Q2) Attempt any Four of the following :

[4 × 2 = 8]

- a) What is the difference between chmod and chown?
- b) List any two advantages of using Docker.
- c) What is package management in Linux?
- d) Write any two reasons for updating the kernel?
- e) Name any two important log files and their uses.
- f) State advantage and disadvantages of Linux.

P.T.O.

Q3) Attempt any Two of the following :

[2 × 4 = 8]

- a) What is SELinux? Describe in detail with three modes.
- b) Write a short note on Backup and Recovery strategies.
- c) What is container virtualization? State advantages of container virtualization.

Q4) Attempt any Two of the following :

[2 × 4 = 8]

- a) Write down troubleshooting commands used in Linux?
- b) What is the Linux kernel and why is it important?
- c) How to create, modify and delete groups in Linux?



Total No. of Questions : 4]

SEAT No. :

PE-3148

[Total No. of Pages : 2

[6507]-2

F.Y. B.Sc. (Cyber & Digital Science)

CDS - 102 - T : FUNDAMENTALS OF C PROGRAMMING

(2024 NEP Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 30

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Give example wherever necessary.*

Q1) Attempt any six of the following :

[6 × 1 = 6]

- a) What is variable?
- b) What is the use of puts() function?
- c) Give syntax of for loop.
- d) Define function.
- e) What is an array?
- f) Write any two format specifiers.
- g) 'C' is Middle level language. State True or False & Justify.
- h) What is recursion?

Q2) Attempt any Four of the following :

[4 × 2 = 8]

- a) Explain the use of the getchar() and putchar() functions.
- b) Explain the concept of call by value in functions.
- c) Describe how to declare and initialize a one-dimensional integer array in C.
- d) Write any four differences between the while loop and the do-while loop.
- e) Explain the purpose of the return statement in a function.

P.T.O.

Q3) Attempt any Two of the following :

[2 × 4 = 8]

- a) What are the limitations of arrays?
- b) Write a C program to display the Fibonacci series up to n terms.
- c) Explain library functions and user-defined functions in C.

Q4) Attempt any Two of the following :

[2 × 4 = 8]

- a) Write a 'C' program to check whether the given number is prime number or not.
- b) Write a program in 'C' to accept two matrices and display the subtraction of it.
- c) Explain logical and relational operator with example.



Total No. of Questions : 4]

SEAT No. :

PE-5002

[Total No. of Pages : 2

[6507]-3

**F.Y. B.Sc. (Cyber and Digital Science)
CDS-103T : FUNDAMENTAL OF COMPUTERS
(2024 Credit Pattern) (Semester - I)**

Time : 2 Hours]

[Max. Marks : 30

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Attempt any Six of the following :

[6 × 1 = 6]

- a) Define an Operating System.
- b) What are Internal Commands in DOS?
- c) Define LAN.
- d) What is a Workstation?
- e) Define Algorithm.
- f) What is Brainstorming?
- g) What is a Peer-to-Peer network?
- h) Define Batch Files.

Q2) Attempt any FOUR of the following :

[4 × 2 = 8]

- a) Explain the different types of Operating Systems.
- b) Write a note on Files and Directories in DOS.
- c) Explain the components of a computer network.
- d) Describe the steps involved in problem solving.
- e) Explain any two common network terminologies: WAN, Node.

Q3) Attempt any TWO of the following

[2 × 4 = 8]

- a) Explain Internal and External DOS commands with examples.
- b) Describe the characteristics of an algorithm and illustrate with an example.
- c) Explain various problem-solving techniques: Trial & Error, Brainstorming, Divide & Conquer.

P.T.O.

Q4) Attempt any TWO of the following :

[2 × 4 = 8]

- a) Explain Network Components : Servers, Clients, and Communication Media.
- b) Describe types of networks : Peer-to-Peer and Client-Server with diagrams.
- c) Explain Batch Files in DOS and write steps to create one.



Total No. of Questions : 5]

SEAT No. :

PE-5529

[Total No. of Pages : 2

[6507]-101

B.Sc. (Cyber and Digital Science)

**IKS-200-T : INDIAN KNOWLEDGE SYSTEM IN
COMPUTING POLICIES
(2024 NEP Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any Eight of the following :

[8 × 1 = 8]

- a) What is a Sutra in Vedic Mathematics?
- b) Name any trick used in Vedic Mathematics for fast addition.
- c) Who is considered the founder of Nyaya philosophy?
- d) What is Vada in Nyaya argumentation?
- e) What is a rule-based AI system?
- f) What is a meta-rule in Panini grammar?
- g) In which ancient texts are the concepts of Vedic Mathematics found?
- h) How many main Sutras are there in Vedic Mathematics?
- i) What is Vedic Mathematics?
- j) What is the main goal of Jalpa?
- k) List two sutras of Subtractions?

P.T.O.

Q2) Attempt any Four of the following :

[4 × 2 = 8]

- a) Define anumana in a Nyaya philosophy.
- b) Compare Chandra binary logic with modern binary number system.
- c) Name of the sixth orthodox School of Indian philosophy.
- d) How is the training of a machine learning model similar to Yogic practice?
- e) Write a note on nyaay sutras.

Q3) Attempt any two of the following :

[2 × 4 = 8]

- a) How to find square using Vedic Mathematics.
- b) State the Sutra used for cube and example.
- c) Define Ashtadhyayi and its significance in Sanskrit grammar.

Q4) Attempt any two of the following :

[2 × 4 = 8]

- a) Explain the concept of meta rule in Panini system.
- b) What are the four pramanas accepted by nyaya School of philosophy.
- c) Describe the purpose of secret communication methods in ancient India.

Q5) Attempt any one of the following :

[1 × 3 = 3]

- a) List the four pillar of knowledge in Patanjali yoga.
- b) Define an explain three types of debate in vada , jalpa and vitanda.



Total No. of Questions : 5]

SEAT No. :

PE-5003

[Total No. of Pages : 2

[6507]-102

**S.Y. B.Sc. (Cyber and Digital Science)
CDS-241-MN : WEB TECHNOLOGY
(2024 Credit Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.

Q1) Attempt any EIGHT of the following :

[8 × 1 = 8]

- a) What is PHP?
- b) Why HTML is called client side scripting language?
- c) What is regular expression?
- d) How to delete file in PHP?
- e) What is an associative array?
- f) List different Popup boxes in JavaScript?
- g) How to read clients data in PHP application?
- h) What is difference between echo () and print () function?
- i) Define data types in JavaScript.
- j) What is CSS?

Q2) Attempt any FOUR of the following :

[4 × 2 = 8]

- a) Explain the structure of the HTML webpage.
- b) What is Client-Server Architecture?
- c) What is a form in HTML? Write any two form controls.
- d) Write two methods to traverse an array in PHP.
- e) Write advantages and disadvantages of CSS.

P.T.O.

Q3) Attempt any TWO of the following :

[2 × 4 = 8]

- a) What is Event? Explain any four events in javascript.
- b) Explain indexed and associative arrays.
- c) Differentiate between JavaScript and PHP.

Q4) Attempt any TWO of the following :

[2 × 4 = 8]

- a) Explain different file operations in PHP with examples.
- b) Write a PHP program to calculate sum of digit of a number.
- c) Write a Java Script program to check whether given number is perfect or not.

Q5) Attempt any ONE of the following :

[1 × 3 = 3]

- a) Explain anonymous function in PHP.
- b) Define file. How to create it? Explain with example.



Total No. of Questions : 5]

SEAT No. :

PE-5004

[Total No. of Pages : 2

[6507]-103
S.Y.B.Sc. (Cyber & Digital Science)
CDS-201-MJ : ETHICAL HACKING - I
(2024 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates :

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw the diagrams wherever necessary.

Q1) Attempt any EIGHT of the following:

[8 × 1 = 8]

- a) Define Ethical Hacking.
- b) What does CIA Triad stand for?
- c) Define Reconnaissance.
- d) What is WHOIS lookup used for?
- e) What is TCP scan?
- f) Name any one vulnerability scanning tool.
- g) What is SQL Injection?
- h) Define XSS (Cross-Site Scripting).
- i) What is Privilege Escalation?

Q2) Attempt any FOUR of the following:

[4 × 2 = 8]

- a) Differentiate between Passive and Active Reconnaissance.
- b) Explain DNS Enumeration with any two tools.
- c) What is OS Fingerprinting?
- d) Explain any two password-cracking techniques.
- e) What are Stored and Reflected XSS?

P.T.O.

Q3) Attempt any TWO of the following:

[2 × 4 = 8]

- a) Explain TCP, UDP, SYN and ACK scanning techniques with examples.
- b) Describe the Ethical Hacking Process step-by-step.
- c) Explain Vulnerability Scanning and differentiate between automated and manual vulnerability assessment.

Q4) Attempt any TWO of the following:

[2 × 4 = 8]

- a) Explain ARP Spoofing and MITM attacks with diagrams.
- b) Explain SQL Injection and demonstrate manual exploitation steps.
- c) Describe Privilege Escalation techniques in Windows and Linux.

Q5) Attempt any One of the following:

[1 × 3 = 3]

- a) Explain Nmap Scripting Engine (NSE) with suitable examples.
- b) Explain Web Application Firewalls and techniques to bypass them.
- c) Describe Shodan and Censys with their uses in OSINT.



Total No. of Questions : 5]

SEAT No. :

PE-5005

[Total No. of Pages : 2

[6507]-104

S.Y.B.Sc. (Cyber & Digital Science)

CDS-202-MJ : CYBER ETHICS, CYBER LAW & CYBER POLICIES
(2024 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates :

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw diagrams wherever necessary.

Q1) Attempt any EIGHT of the following:

[8 × 1 = 8]

- a) What is cybercrime?
- b) What is cyberstalking?
- c) Write down examples of a trademark.
- d) Write down any two rights provided under GDPR.
- e) What is the full form of the IT Act?
- f) What is cyber ethics?
- g) What is phishing?
- h) Define Copyright.
- i) Name one common challenge in enforcing data privacy laws.
- j) What is the role of CERT-In?

Q2) Attempt any FOUR of the following:

[4 × 2 = 8]

- a) Explain any two characteristics of cyberspace.
- b) What is ISO/IEC 27002?
- c) How do patents encourage innovation?
- d) What is personally identifiable information?
- e) What is a cyber-security framework?

P.T.O.

Q3) Attempt any TWO of the following:

[2 × 4 = 8]

- a) Explain the components of a strong cyber security framework.
- b) Write differentiate between GDPR and CCPA.
- c) What role does international law play in IP protection?

Q4) Attempt any TWO of the following:

[2 × 4 = 8]

- a) Write down how effective DRM technologies are in protecting music and video content.
- b) Write a short note on IT Act 2000.
- c) Write differentiate between moral, ethical, and legal issues in cyberspace.

Q5) Attempt any one of the following:

[1 × 3 = 3]

- a) Write differentiate between GDPR, CCPA, and the Indian Data Protection law.
- b) Write down the different types of cybercrime with an example.



Total No. of Questions : 5]

SEAT No. :

PE-1608

[Total No. of Pages : 2

[6507]-301

S.Y. B.Sc. (Cyber & Digital Science)

CDS - 231 : Basics of Ethical Hacking

(2020 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagram wherever necessary.*

Q1) Attempt any **Ten** of the following :

[10 × 1 = 10]

- a) Write any two names of tools used in hacking.
- b) Enlist types of enumeration.
- c) Define ethical hacking.
- d) What is CIA triad?
- e) Enlist the common ports used in ethical hacking.
- f) What is privilege escalation? Explain in brief.
- g) What is physical addressing?
- h) What is a buffer overflow attack?
- i) What is private address and public address?
- j) What is evil twining?
- k) Explain what is SQL injection?
- l) What is OSINT?

Q2) Attempt any **Five** of the following :

[5 × 2 = 10]

- a) What are the types of hacking?
- b) Explain TCP communication.
- c) Define network sniffing and enlist its tools.
- d) Write difference between phishing and vishing.
- e) What is exploit? Enlist the steps of manual exploitation.
- f) Define the terms
 - i) Spyware
 - ii) Adware

P.T.O.

Q3) Answer any **Four** of the following : **[4 × 5 = 20]**

- a) Write advantages and disadvantages of ethical hacking?
- b) What is web application? Explain flow of web application.
- c) Explain intelligence cycle.
- d) Explain types of brute force attack.
- e) Explain CIA Triad in detail.

Q4) Answer any **Four** of the following : **[4 × 5 = 20]**

- a) Explain OSI Model.
- b) What is the difference between a white hat hacker and a black hat hacker?
- c) What is password spraying? How a Password Spraying Attack Is Conducted.
- d) Explain social engineering attack with its types.
- e) Write a short note on OWASP.

Q5) Answer any **One** of the following : **[1 × 10 = 10]**

- a) Explain metasploit framework. **[5]**
- b) Explain 802.11 protocol. **[3]**
- c) Which are the types of password attacks. **[2]**

OR

- a) Explain port scanning techniques. **[5]**
- b) Write a short note on social engineering. **[3]**
- c) Define network sniffing. **[2]**



Total No. of Questions : 5]

SEAT No. :

PE1609

[Total No. of Pages : 3

[6507]-302

S.Y. B.Sc. (Cyber and Digital Science)

CDS - 232 : DATABASE MANAGEMENT SYSTEMS

(2020 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data if necessary.*

Q1) Attempt any ten of the following.

[10×1=10]

- a) What is data independence?
- b) Define the data model.
- c) What is an file?
- d) Draw and write any two notations of ER model.
- e) Justify true of false - “Primary key cannot be Null”.
- f) What is Outer Join?
- g) What is locking?
- h) Define intersection operation.
- i) What is schedule?
- j) What is XML?
- k) Define weak entity?
- l) Enlist types of joins?

P.T.O.

Q2) Attempt any five of the following.

[5×2=10]

- a) Write a short note on the relational operator with an example :
 - i) Union
 - ii) Difference
- b) Write the difference between 1NF & 2NF.
- c) Explain a relational database model.
- d) Explain the time-stamp protocol with an example.
- e) Write a short note on multimedia databases.
- f) What is an attribute? Write any two types of attributes with notation & example.

Q3) Attempt any four of the following.

[4×5=20]

- a) Explain the concept of decomposition with an example.
- b) Define functional dependency with the help of an example.
- c) Write the advantages & disadvantages of normalization with examples.
- d) Define Terms :
 - i) Entity
 - ii) Tuple
 - iii) Relations
 - iv) Select operations
- e) Explain the need for database management system

Q4) Attempt any four of the following.

[4×5=20]

- a) What is transaction? Explain the properties of transaction with examples.
- b) Consider $R(A, B, C, D, G, H, I)$ and set of FD defined on R as $F = \{A \rightarrow B, A \rightarrow C, CG \rightarrow I, B \rightarrow H\}$ compute the closure of F. i.e. $F^+(CH.2)$.
- c) Explain the structure of DBMS with a neat label diagram.
- d) Explain the difference between serial & Non serial schedule.
- e) Explain the need for concurrency control.

Q5) Attempt any one of the following.

[1×10=10]

A) a) Consider the following relations : **[5]**

Wholesaler (w-no, w-name, address, city)

Product (p-no, p-name).

Create a relationship database & solve the following queries in SQL.
Wholesalers and products are related to many-to-many relationships.

- i) List the wholesaler of the product “Keyboard”.
- ii) List no. of wholesalers from “Pune” city.
- iii) Delete records of wholesalers where the product name is “Mouse”.

b) Discuss the dirty read problem **[3]**

c) Write any two anomalies related to normalization. **[2]**

OR

B) a) Design an E-R diagram for Hospital Management System. **[5]**

b) Write a short note on distributed databases. **[3]**

c) What is deadlock? Write a short note on it. **[2]**



Total No. of Questions :5]

SEAT No. :

PE1610

[Total No. of Pages : 2

[6507]-303

S.Y.B.Sc. (Cyber and Digital Science)

CDS-233 : DATA STRUCTURE USING PYTHON

(2020 Pattern) (Semester-III)

Time :3Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data if necessary.*

Q1) Attempt any EIGHT of the following.

[8×2=16]

- a) Define Space complexity?
- b) Give best case and worst case time complexity of bubble sort.
- c) List the 4 types of queues.
- d) State any 2 applications of stack.
- e) List any two asymptotic notations.
- f) Define minimul spanning tree?
- g) What is strict binary tree?
- h) What is data structure? Give its types.
- i) Define Linked List and state the types of linked list.
- j) What is ADT?

Q2) Attempt any FOUR of the following:

[4×4=16]

- a) Sort the following data using Heap sort technique: 54, 32, 12, 45, 123, 1, 33, 85
- b) Differentiate between Singly Linked List and Doubly Linked List
- c) Explain how infix expression can be converted to its equivalent postfix expression using stack.
- d) List 3 tree traversal techniques and explain any one in detail.
- e) List 2 graph representation methods & explain any one in detail.

P.T.O.

Q3) Attempt any FOUR of the following: **[4×4=16]**

- a) Write a function to add a node at the end of circular singly linked list.
- b) Write a python program to sort the elements using Bubble Sort technique
- c) Write a function to delete a node by position from doubly linked list.
- d) Write a function to search an element in array using Binary search method.
- e) Write a function to check whether a string is palindrome or not using stack.

Q4) Attempt any FOUR of the following: **[4×4=16]**

- a) Write a function to delete a last Node from singly linked list
- b) Construct a binary search tree for the following data: VIOLET, INDIGO, BLUE, GREEN, YELLOW, ORANGE, RED
- c) Explain merge sort technique with an example.
- d) Explain BFS with an example.
- e) What is queue? Explain its operations with an example.

Q5) Attempt any TWO of the following: **[2×3=6]**

- a) Explain kruskals algorithm for minimul spanning tree.
- b) What is AVL tree? Explain its any two rotations with an example.
- c) Write a python program for the implementation of priority queue.



Total No. of Questions : 5]

SEAT No. :

PE-1611

[Total No. of Pages : 3

[6507]-401

S.Y. B.Sc. (Cyber and Digital Science)

CDS-241 : PRINCIPLES OF OPERATING SYSTEMS

(2020 Pattern) (Semester - IV) (24101)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw diagrams wherever necessary.

Q1) Attempt any ten of the following :

[10 × 1 = 10]

- a) What is kernel?
- b) What is turnaround time of a process?
- c) What is deadlock?
- d) What do you understand by degree of multiprogramming?
- e) What is thread?
- f) What is critical section problem?
- g) What is orphan process?
- h) What is page fault?
- i) What is bit vector?
- j) What is compaction?
- k) What is file system?
- l) Give major function of MMU.

Q2) Attempt any Five of the following.

[5 × 2 = 10]

- a) What are advantages of Distributed OS?
- b) What are message passing techniques in OS?
- c) What do you understand by Banker's algorithm?
- d) What are the different states of a process?
- e) What is Reader-Writer Problem in OS?
- f) What is Resource allocation Graph?

P.T.O.

Q3) Answer any Four of the following.**[4 × 5 = 20]**

- a) Consider the following set processes CPU time given in millisecond. Illustrate the execution of processes using Non-Pre-emptive SJF CPU scheduling algorithm and Draw the Gantt-chart, calculate the turnaround time, waiting time, average turnaround time and average waiting time.

Process	Arrival Time	Burst Time
P0	3	1
P1	1	1
P2	0	2
P3	2	3
P4	2	2

- b) Consider following set of reference string 2 3 2 1 5 2 4 5 3 2 5 2. Assume 3 free frames. Find the number of page fault according to FIFO, LRU page replacement algorithm.
- c) What is fragmentation? Explain with its types.
- d) What are four necessary conditions to be hold simultaneously in system to deadlock avoidance?
- e) Write a note on Sequential vs Direct Access method?

Q4) Answer any Four of the following.**[4 × 5 = 20]**

- a) What is Context Switch? What are the actions taken by the kernel during context switch between the processes?
- b) Consider a system with 5 processes P0 to P4 and 3 Resource types A, B, C where A has 10 instances, B has 5 instances, C has 7 instances. Suppose at the time to the System the Snapshot is as follows.

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

- i) What is Content of Need Matrix?
- ii) Is System in a Safe State?
- iii) If a Request from process P1 arrives for additional resource (1, 0, 2) can the request is granted immediately.
- c) Explain Demand Paging in Details.
- d) Write a note on tree level directory structures.
- e) What is operating System? Explain the various services provided by Operating Services.

Q5) Answer any One of the following.

[1 × 10 = 10]

- a) What is Process Control Block (PCB). Explain the Components of PCB **[5]**
- b) What is purpose of using Semaphores? How are semaphores used in concurrent Processing? **[3]**
- c) Consider a reference String 3,2,1,0,3,2,4,3,2,1,0,4. Assume number of free frames = 3. Find out the number of page fault using OPT Page replacement. **[2]**

OR

- a) Explain indexed file allocation ? State advantages & disadvantages of indexed allocation **[5]**
- b) What is multilevel feedback Queue Scheduling **[3]**
- c) List the different file types. **[2]**



Total No. of Questions : 5]

SEAT No. :

PE1612

[Total No. of Pages : 2

[6507]-402

S.Y. B.Sc. (Cyber and Digital Science)

CDS-242 : WEB AND MOBILE APPLICATION

(2020 Pattern) (Semester - IV) (24103)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat diagrams whenever necessary.*

Q1) Attempt any eight of the following.

[8×2=16]

- a) What is JavaScript? Write the advantages of JavaScript.
- b) Differentiate between HTTP and HTTPS in terms of security.
- c) What is a stylesheet? List the types of style sheets.
- d) What are the primitive data types in JavaScript?
- e) What is the purpose of the alert() function in JavaScript?
- f) What is the role of a Web Server?
- g) List any two advantages of PHP.
- h) What is the purpose of the print_r() function in PHP? Give an example.
- i) What is a when expression in Kotlin?
- j) How do you declare a variable in Kotlin? Give an example.

Q2) Attempt any four of the following.

[4×4=16]

- a) Explain the difference between single-quoted and double-quoted strings in PHP with example.
- b) Why is Kotlin preferred over Java for Android development? How do you define a class in Kotlin?
- c) What is a regular expression in JavaScript? Explain.
- d) Explain the difference between pass-by-value and pass-by-reference in PHP.
- e) Explain the structure of the HTML webpage with an example.

P.T.O.

Q3) Attempt any four of the following. [4×4=16]

- a) Explain the lifecycle of an Android Activity and how it relates to Kotlin programming.
- b) How can you concatenate strings in PHP? Give an example.
- c) What is a TextField in Android and how is it used to take user input?
- d) Build a JavaScript program to convert temperature from Celsius to Fahrenheit.
- e) Design a PHP program to print the reverse of any number.

Q4) Attempt any four of the following. [4×4=16]

- a) Write a JavaScript program to demonstrate event handling using onclick, onchange and onload events.
- b) Discuss the role of XML layouts and Kotlin code in creating user interfaces for Android apps.
- c) Explain the process of encrypting a message using symmetric encryption algorithms.
- d) How do you use a Button in Android? Explain its behavior.
- e) What is the use of heredoc syntax in PHP for strings? Provide an example of a heredoc string.

Q5) Attempt any two of the following. [2×3=6]

- a) What are the main categories of cybersecurity threats? Provide examples of each.
- b) Explain the concept of type casting and type conversion in Kotlin variables.
- c) What is the difference between indexOf () and lastIndexOf() in JavaScript?



Total No. of Questions :5]

SEAT No. :

[Total No. of Pages : 3

PE1613

[6507]-403

S.Y.B.Sc. (CDS)

**CDS-243 : NETWORK SECURITY AND CRYPTOGRAPHY
(2020 Pattern) (Semester-IV) (24105)**

Time :3Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any TEN of the following:

[10×1=10]

- a) Define non-repudiation.
- b) What is access control?
- c) Define WAP security.
- d) What is HTTPS?
- e) Define a transposition cipher.
- f) What is a one-time pad?
- g) What is an International Data Encryption Algorithm (IDEA)?
- h) What are the principles of block cipher design?
- i) What is the purpose of the Knapsack algorithm?
- j) What is the primary advantage of public key cryptography?
- k) What is the size of key used in DES?
- l) What is SHA-256?

P.T.O.

Q2) Attempt any FIVE of the following:

[5×2=10]

- a) What is CBC mode? How is it used in hashing?
- b) Define Authentication. Enlist the different types of authentication.
- c) What is Brute Force attack?
- d) Explain how stream ciphers work.
- e) What is the difference between encryption and decryption?
- f) What is the role of SSH in security?

Q3) Attempt any FOUR of the following:

[4×5=20]

- a) Describe IEEE 802.11i and its role in wireless network security.
- b) Explain the network security model with a diagram.
- c) Convert “BAT” using Hill cipher with the key matrix. Convert the cipher text back to plaintext.

$$\begin{pmatrix} 2 \\ 0 \\ 19 \end{pmatrix}$$

- d) Explain the importance of key management in symmetric encryption.
- e) Discuss DES encryption techniques.

Q4) Attempt any FOUR of the following:

[4×5=20]

- a) Perform encryption and decryption using RSA Algorithm for the following.
 $P=17; q=11; e=7; M=88.$
- b) Explain the Diffie-Hellman key exchange process.
- c) Explain the concept of XML security and its role in cryptography.
- d) Compare different types of hashing algorithms(MD5,SHA-1,SHA-256).
- e) Explain different types of digital signature schemes.

Q5) Attempt any ONE of the following:

[1×10=10]

- a) i) Describe OSI Security Architecture with a diagram. **[5]**
ii) Explain WAP security in detail. **[3]**
iii) What is the significance of the Knapsack algorithm in cryptography? **[2]**

OR

- b) i) What are the key security properties of a cryptographic hash function? **[5]**
ii) Explain the working of Playfair cipher work with an example. **[3]**
iii) What is the advantage of Blowfish encryption? **[2]**



Total No. of Questions : 5]

SEAT No. :

PE1614

[Total No. of Pages : 2

[6507]-501

T.Y. B.Sc. (Cyber & Digital Science)
CDS - 351 : DIGITAL FORENSICS - I
(2020 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any ten of the following :

[10×1=10]

- a) What is digital forensic?
- b) What is the process of digital forensic?
- c) Define Cyber-crime.
- d) Define volatile memory.
- e) Name any two primary storage.
- f) Define NTFS.
- g) Define Digital evidence.
- h) What is Digital File Metadata?
- i) Define Chain of custody.
- j) What is search warrant?
- k) What is DHCP?
- l) Define Mobile Forensics.

Q2) Attempt any five of the following :

[5×2=10]

- a) Explain different types of computer storages.
- b) Explain Challenges of Acquiring Digital Evidence.
- c) What is the firewall?
- d) What are Validation Protocols?
- e) What are network Forensics?
- f) State the difference between NTFS & FAT.

P.T.O.

Q3) Attempt any four of the following : **[4×5=20]**

- a) Explain Digital Forensics and its goals.
- b) Discuss Chain of Custody in detail.
- c) Explain difference between Digital Forensics vs. Other Computing Domain.
- d) Explain Command-Line Forensics Tools.
- e) How can we remove Malwares from our computer systems?

Q4) Attempt any four of the following : **[4×5=20]**

- a) Explain Digital Forensics Hardware Tools.
- b) Discuss different types of cybercrimes.
- c) Explain the roll of first responder tasks.
- d) Explain in detail Digital Forensics Examination Process.
- e) Describe the challenges associated with recovering deleted or hidden digital data during a forensic examination.

Q5) Attempt any one of the following : **[1×10=10]**

- a) Explain Different types of digital forensics. **[5]**
- b) What is the primary objective of digital forensics ? How does it differ from traditional forensic science? **[3]**
- c) Explain Digital Evidence types. **[2]**

OR

- a) Describe the role of a digital forensic investigator in a cybercrime investigation. Which skills and tools are necessary for this role? **[5]**
- b) Write note on: Network Traffic. **[3]**
- c) Explain Computer Encoding Character Schema. **[2]**



Total No. of Questions :5]

SEAT No. :

PE1615

[Total No. of Pages : 3

[6507]-502

T.Y.B.Sc. (Cyber & Digital Science)

CDS-352 : CYBER THREAT INTELLIGENCE

(2020 Pattern) (Semester-V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any Ten of the following

[10×1=10]

- a) Define Threat Intelligence.
- b) Define raw monitoring data.
- c) What is meant by “regional implementations” in information sharing?
- d) Give an example of a common tool used in CTI.
- e) What is meant by cybercrime?
- f) Define a data breach in the context of information sharing.
- g) Name one key technology used to implement a national TI framework.
- h) Name one key component of the EU cybersecurity legal framework.
- i) Name a task typically handled by a national cybersecurity center.
- j) Define Malware.
- k) What is meant by “C2” in the Cyber Kill Chain?

Q2) Attempt any Five of the following

[5×2=10]

- a) Discuss how efficient cooperation and coordination contribute to successful information sharing
- b) Explain the role of intelligence communities in shaping cybersecurity efforts.
- c) What is the role of cybersecurity strategies at the national level?

P.T.O.

- d) What is the benefit of cross-organizational information sharing in cybersecurity?
- e) What is the overall goal of implementing a national TI framework?
- f) What is the primary goal of information sharing best practices?

Q3) Attempt any Four of the following: [4×5=20]

- a) Explain the steps involved in the Cyber Kill Chain, focusing on any two steps
- b) Explain the significance of regional and international implementations in information sharing
- c) Discuss the importance of well-structured CTI communities in the sharing of threat information
- d) Discuss the relationship between cybersecurity centers and their role in national defense strategies
- e) What is the purpose of a national threat intelligence (TI) framework?

Q4) Attempt any Four of the following: [4×5=20]

- a) Evaluate the importance of having comprehensive situational awareness for effective cyber security strategies at the national and international levels.
- b) Describe the ‘Exploitation and Initial Intrusion’ phase in a cyber attack scenario.
- c) Discuss the key components of national and international cybersecurity strategies.
- d) Explain how the EU cybersecurity legal framework supports information sharing between organizations.
- e) Evaluate the role of legal frameworks in managing and mitigating risks associated with data breaches

Q5) Attempt any One of the following: **[1×10=10]**

- a) Describe the importance of network analysis in extracting cyber threat intelligence **[5]**
- b) Discuss two major challenges faced during threat information sharing between organizations. **[3]**
- c) What is the primary goal of cooperation and coordination in information sharing? **[2]**

OR

- a) Explain the overall architecture required to implement a national threat intelligence framework. **[5]**
- b) Analyze the potential legal barriers to data transfer and their impact on cross-border information sharing. **[3]**
- c) Discuss the promise and potential benefits of cyber threat intelligence communities. **[2]**



Total No. of Questions : 5]

SEAT No. :

[Total No. of Pages : 2

PE1616

[6507]-503

T.Y.B.Sc. (Cyber & Digital Science)

CDS-353 : INFORMATION SECURITY POLICY AND AUDIT

(2020 Pattern) (Semester-V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any TEN of the following:

[10×1=10]

- a) What is Information Security?
- b) Define Physical Security.
- c) Define IPv6.
- d) GDPR stands for.
- e) Define HMAC.
- f) What are the components of an information system?
- g) Define multi-factor authentication (MFA).
- h) Define Corporate Governance.
- i) Define Role of GSO and SSO in IT management Security.
- j) What is the purpose of the PCI DSS standard?
- k) What is incident handling?

Q2) Attempt any FIVE of the following:

[5×2=10]

- a) What is cryptography? What is the purpose of encryption?
- b) What is the difference between incident detection and incident response?
- c) What is the role of security audits in organizational security?
- d) Define Contingency plan.
- e) What is DNSSec
- f) What is IT governance? Name mostly used IT governance framework.

P.T.O.

Q3) Attempt any FOUR of the following: **[4×5=20]**

- a) What are the Frameworks and Standards for Cyber Security Domains?
- b) What is good governance? How it contribute to the development of a organization?
- c) Short note on Intrusion detection systems & firewall.
- d) Explain the Operating System Security
- e) Explain the purpose of auditing in an organization and its importance in ensuring financial accuracy and compliance.

Q4) Attempt any FOUR of the following: **[4×5=20]**

- a) Explain how the Payment Card Industry Data Security Standard (PCI DSS) helps in securing financial transactions.
- b) What is Logical Security ? Explain the types of Logical Security.
- c) Short note on Segregation of duties.
- d) Explain the Parts of Cyber Domain.
- e) Short note on IS auditing standards.

Q5) Attempt any One of the following: **[1×10=10]**

- a) Explain Network Attacks and also explain hosted based and web based attacks. **[5]**
- b) Explain Message Authentication Code (MAC) **[3]**
- c) Short note on Cloud Computing **[2]**

OR

- a) Explain ISMS Briefly. **[5]**
- b) Write down the steps of information security audit reports. **[3]**
- c) Define Digital signatures. **[2]**



Total No. of Questions : 5]

SEAT No. :

PE1617

[6507]-504

[Total No. of Pages : 2

**T.Y.B.Sc. (Cyber & Digital Science)
CDS-357-A- : MOBILE FORENSICS
(Professional Elective - I)
(2020 Pattern) (Semester - V)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*
- 3) Draw diagrams wherever necessary.*

Q1) Attempt any EIGHT of the following.

[8×1=8]

- a) Provide any two mobile operating systems.
- b) Define Mobile Forensics.
- c) Define Acquisition.
- d) What is JTAG.
- e) What is File Craving.
- f) What is physical acquisition.
- g) Define artefact.
- h) Define Open Source.
- i) What is the full form of SIM.
- j) What is use of security controls?

Q2) Attempt any FOUR of the following.

[4×2=8]

- a) Explain different types of Mobile forensics.
- b) Provide any two data recovery software's.
- c) Explain the usage of oxygen forensics suits
- d) State the difference between android & windows mobile forensics.
- e) What are the usages of UFED Physical Analyzer

P.T.O.

Q3) Attempt any TWO of the following.

[2×4=8]

- a) Explain Mobile Forensics Process.
- b) Explain different types of challenges in mobile forensics.
- c) Explain in detail Artefacts Extraction.

Q4) Attempt any TWO of the following.

[2×4=8]

- a) Explain Mobile Device Architecture in detail.
- b) Explain different Open-Source Mobile Forensic Tools.
- c) Explain Features of Oxygen Forensics Suite.

Q5) Attempt any ONE of the following.

[1×3=3]

- a) Write Short note on: Evolution of Mobile Device.
- b) Write Short note on: Deleted Files Recovery



Total No. of Questions :5]

SEAT No. :

PE1618

[Total No. of Pages : 2

[6507]-505

T.Y.B.Sc. (Cyber & Digital Science)

CDS-357B : CLOUD SECURITY

(2020 Pattern) (Semester-V) (Professional Elective-I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any Eight of the following:

[8×1=8]

- a) List any two essential characteristics of cloud computing.
- b) What is data tokenization?
- c) Give one example of a cloud service provider.
- d) What is the first step in IAM lifecycle?
- e) Give one example of compute assets in the cloud.
- f) What is the key difference between IaaS and PaaS?
- g) What is the difference between authentication and authorization?
- h) What is the impact of processing leaks on cloud performance?
- i) Define cloud asset tagging.
- j) List any two disadvantages of cloud computing.

Q2) Attempt any Four of the following:

[4×2=8]

- a) Compare Public Cloud and Private Cloud.
- b) What do you mean by encryption in motion and encryption at rest?
- c) How does multi-factor authentication (MFA) improve security?
- d) Illustrate an example of access revocation in IAM.
- e) Define data classification and explain its role in cloud security.

P.T.O.

Q3) Attempt any Two of the following:

[2×4=8]

- a) A multinational company wants to move its business operations to the cloud. The company is concerned about security, cost, and compliance. Based on this, suggest an appropriate cloud deployment model and justify your answer.
- b) What are the major challenges in Cloud Security and how can they can be mitigated?
- c) Write a short note on Relevant Technologies in Cloud Computing.

Q4) Attempt any Two of the following:

[2×4=8]

- a) Write a short note on Virtualization in Cloud Computing.
- b) Explain about creating, deleting, granting, and revoking access in IAM.
- c) Write a note Software as a Service (SaaS). Explain it with an example.

Q5) Attempt any One of the following:

[1×3=3]

- a) Explain Request, Approve, Revalidate phases in IAM.
- b) Explain the concept of cloud computing. How does Cloud Computing reduce infrastructure costs?



Total No. of Questions : 5]

SEAT No. :

PE1619

[Total No. of Pages : 2

[6507]-601

T.Y. B.Sc. (Cyber & Digital Science)
CDS - 361 : DIGITAL FORENSICS - II
(2020 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*
- 3) Draw diagrams wherever necessary.*

Q1) Attempt any ten of the following :

[10×1=10]

- a) What is email investigation?
- b) Name two forensic tools used for social media investigations.
- c) What is the purpose of the mobile phone evidence extraction process?
- d) What is a bitmap image?
- e) Name two tools used for viewing images in forensic analysis.
- f) List any two cloud deployment methods.
- g) What are virtual networks?
- h) What is a forensic snapshot in VM investigations?
- i) Define Service Level Agreement (SLA).
- j) What is data compression in multimedia forensics?
- k) Define social media forensics.
- l) Explain Data Compression.

Q2) Attempt any five of the following :

[5×2=10]

- a) What is the importance of email logs in an investigation?
- b) What is the difference between manual and logical data extraction?
- c) Define copyright in the context of multimedia forensics.
- d) What is the purpose of investigating Cloud Service Providers (CSPs)?
- e) Name two common network security threats that require forensic analysis.

P.T.O.

Q3) Attempt any four of the following : **[4×5=20]**

- a) Explain the process of investigating email crimes and violations.
- b) Describe the imaging process of an Android phone and SD card.
- c) Differentiate between lossless and lossy compression with examples.
- d) Discuss the role of cloud vendors in cloud computing.
- e) Explain the role of the HoneyNet Project in network forensics.

Q4) Attempt any four of the following : **[4×5=20]**

- a) Explain the importance of email server logs in forensic investigations.
- b) Which are the challenges in securing a network for forensic purposes?
- c) Discuss different mobile forensics acquisition procedures.
- d) Describe the different types of graphics file formats.
- e) List and describe some commonly used tools for cloud forensics.

Q5) Attempt any one of the following : **[1×10=10]**

- a) Discuss the challenges of social media forensics on mobile devices. **[5]**
- b) What is the use of Autopsy in mobile forensics? **[3]**
- c) Define role of an email server. **[2]**

OR

- a) Explain the architecture and analysis of cloud forensic data. **[5]**
- b) What is the difference between Type 1 and Type 2 hypervisors? **[3]**
- c) Name two types of data that can be extracted using ADB pull. **[2]**



Total No. of Questions :5]

SEAT No. :

PE1620

[Total No. of Pages : 2

[6507]-602

T.Y. B.Sc. (Cyber & Digital Science)

CYBER LAW

**CDS-362 : (Information Security Policies and Strategies)
(2020 Pattern) (Semester-VI)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data if necessary.*

Q1) Attempt any ten of the following

[10×1=10]

- a) What is Cybersecurity?
- b) Define Encryption.
- c) Which law governs cybercrimes in India?
- d) What is the impact of cybercrime on organizations?
- e) What is the role of a Password Policy in information security?
- f) What is a Security Policy Framework in planning?
- g) Define Access Control Policy.
- h) What is the purpose of the ISO/IEC 27001 standard?
- i) What should a disaster recovery procedure address?
- j) What is Malware?
- k) What is Application Security?

Q2) Attempt any five of the following

[5×2=10]

- a) List and explain two important elements in procedure writing for cybersecurity?
- b) Where can organizations obtain cybersecurity standards?
- c) What are two key elements of an information security policy?

P.T.O.

- d) Why are milestones important in the policy development process?
- e) What is the purpose of organizationwide (Tier I) policies in information security?
- f) What challenges do organizations face with social computing?
- g) Why are cyberlaws needed in India?

Q3) Attempt any four of the following [4×5=20]

- a) Explain the importance of cyber laws in India.
- b) What is the difference between cyber law and data protection laws?
- c) How does blockchain technology enhance cybersecurity?
- d) What are the different types of cyber fraud, and how can they be detected?
- e) What is denial-of-service (DoS) attack, and how does the IT Act address it?

Q4) Attempt any four of the following [4×5=20]

- a) Define cybercrime and explain its various types.
- b) Discuss the key provisions of the Information Technology Act, 2000.
- c) Explain the concept of hacking and its legal consequences in India.
- d) What is cyber terrorism? How does the IT Act address it?
- e) Explain in detail the different types of cybercrimes with real-life examples.

Q5) Attempt any one of the following [1×10=10]

- a) Describe the role of digital signatures in cybersecurity and cyber law. [5]
- b) Explain the role of CERT-In (Computer Emergency Response Team - India). [3]
- c) What are cyber defamation and its legal implications? [2]

OR

- a) How do cyber laws apply to social media platforms? [5]
- b) What is identity theft, and how does the IT Act address it? [3]
- c) How does cyber law help in preventing online fraud? [2]



Total No. of Questions : 5]

SEAT No. :

PE1621

[Total No. of Pages : 2

[6507]-603

T.Y.B.Sc. (Cyber & Digital Science)

CDS-363 : WEB SCIENCE

(2020 Pattern) (Semester-VI)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any Ten of the following:

[10×1=10]

- a) What does CSS stand for?
- b) What is the main purpose of JavaScript in web development?
- c) What does a “404 Not Found” error indicate in HTTP?
- d) What is the role of cookies in web browsers?
- e) What is a hybrid approach in web application development?
- f) What is the root element in an XML document?
- g) What is the primary objective of the Security Development Lifecycle (SDLC)?
- h) Explain SQL Injection attack.
- i) Define Multi-Factor Authentication (MFA).
- j) Which protocol is commonly used with SOAP for communication?
- k) Which are the key characteristics of the programmatic approach to web development?
- l) Enlist the key components of SOAP message.

Q2) Attempt any FIVE of the following:

[5×2=10]

- a) What is AJAX and how does it improve user experience on websites?
- b) What are the differences between the GET and POST HTTP methods?
- c) What is the purpose of the action attribute in an HTML form tag?
- d) How does Agile SDL fit within the iterative nature of Agile development methodologies?
- e) What is the role of account lockout mechanisms in mitigating brute-force attacks?
- f) Describe the purpose of UDDI in service discovery.

P.T.O.

Q3) Attempt any Four of the following: **[4×5=20]**

- a) Discuss the role of databases in dynamic web applications and explain how server-side languages interact with databases to retrieve and update content?
- b) Explain the HTTP request-response cycle, detailing the steps involved when a client requests a webpage from a server.
- c) Explain the role of APIs in web development. How do RESTful APIs work?
- d) Explain the key differences between Web 1.0, Web 2.0, and Web 3.0.
- e) Explain the concept of passwordless authentication and discuss its potential benefits and challenges.

Q4) Attempt any Four of the following: **[4×5=20]**

- a) Describe the programmatic approach to web application development and its advantages and disadvantages.
- b) How does Blockchain Technology improve web security?
- c) Explain Web Architecture Components in detail.
- d) Discuss the advantages and disadvantages of using SOAP as a web service protocol.
- e) Explain the concept of cloud computing and its impact on web applications.

Q5) Attempt any One of the following: **[1×10=10]**

- a) Explain how Multi-Factor Authentication (MFA) enhances password security. Explain different MFA methods with suitable example. **[5]**
- b) What is the purpose of the **<meta>** tag in an HTML document, and why is it important for SEO? **[3]**
- c) Describe the role of a proxy server in web architecture. **[2]**

OR

- a) What is the role of the XML parser? How does it interact with an XML document? **[5]**
- b) Explain different parsing methods used by XML parsers. **[3]**
- c) What is meant by stateless in HTTP? **[2]**



Total No. of Questions : 5]

SEAT No. :

PE1622

[Total No. of Pages : 2

[6507]-604

T.Y.B.Sc. (Cyber & Digital Science)

CDS-367A : MALWARE ANALYSIS

(2020 Pattern) (Semester - VI) (Professional Elective - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat diagrams wherever necessary.*

Q1) Attempt any eight of the following.

[8×1=8]

- a) Define keylogger?
- b) What is COM hijacking?
- c) “The process of identifying and fixing errors in a program.”
State-True/False.
- d) What does IDA stand for?
- e) What is the purpose of CPU registers?
- f) Name one tool used for network monitoring in dynamic analysis.
- g) Give two examples of malware.
- h) List two malicious actions of malware.
- i) What is malware?
- j) What is Dynamic-Link Library (DLL) Analysis?

Q2) Attempt any four of the following.

[4×2=8]

- a) What are the types of malware analysis?
- b) What is the role of packers and cryptors in malware?
- c) Explain the difference between branching and loops in assembly language.
- d) How does scripting help in malware debugging?
- e) What is a downloader in malware, and how does it work?

P.T.O.

Q3) Attempt any two of the following.

[2×4=8]

- a) Enlist malware persistence methods. Describe image file execution options in malware persistence methods.
- b) What are Code Analysis Tools, and why are they important in malware analysis?
- c) Explain the basic components of a computer and their role in program execution.

Q4) Attempt any two of the following.

[2×4=8]

- a) Explain the role of python scripting in debugging malware?
- b) Describe about windows malware and Linux malware with examples.
- c) What is multiple antivirus scanning, and why is it used in malware analysis, explain in detail?

Q5) Attempt any one of the following.

[1×3=3]

- a) What is the purpose of extracting strings in malware analysis?
- b) A company's network was infected with ransomware that encrypted all files and displayed a ransom note. As a malware analyst, which analysis techniques would you use to examine the ransomware, and why?



Total No. of Questions : 5]

SEAT No. :

PE1623

[6507]-605

[Total No. of Pages : 2

T.Y.B.Sc. (Cyber & Digital Science)

CDS - 367B : FINTECH - CYBER SECURITY

(2020 Pattern) (Semester - VI) (Professional Elective - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) Attempt any Eight of the following:

[8×1=8]

- a) What is the significance of 'User Experience (UX)' in FinTech?
- b) Why are tech giants becoming non-bank banks?
- c) What are smart contracts?
- d) What is India's FinTech ecosystem focused on?
- e) What does 'The Rise of the Rest in FinTech' refer to?
- f) What is operational risk in cyber security?
- g) How does behavioral biometrics enhance security?
- h) What is the purpose of monitoring and reporting in FinTech cyber security?
- i) What is one advantage of using Big Data in regulatory compliance?
- j) What is Threat Intelligence?

P.T.O.

Q2) Attempt any four of the following: [4×2=8]

- a) What is the 'E-Book Moment' in banking, and why is it significant?
- b) Why is an integrated FinTech ecosystem important for financial innovation?
- c) Explain how FinTech can contribute to economic growth in developing countries.
- d) How does Ultra-Fast Text Analytics benefit trading strategies?
- e) What is the role of AI in improving payment and transaction security?

Q3) Attempt any two of the following: [2×4=8]

- a) Explain the importance of technology vulnerability management in FinTech.
- b) Describe the role of cryptocurrencies in modern financial systems.
- c) Explain the role of risk treatment in financial cyber security.

Q4) Attempt any two of the following: [2×4=8]

- a) Describe the impact of Big Data on regulatory compliance in financial institutions.
- b) What are the key security measures for protecting FinTech applications?
- c) What are the key benefits of blockchain technology in FinTech?

Q5) Attempt any one of the following: [1×3=3]

- a) What is phishing, and how does it impact financial cyber security?
- b) How do smart contracts work in blockchain-based financial transactions?

