

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. -CS - Semester -I - Jan-2022

(20-23)

Subject Code: CTMSCS SI P1 2024 - Pradip bhai; Date: 05/01/2023

Subject Name: Essentials of Cyber Security and Cyber Warfare

Time: 3 Hours

75/8
9

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Parts of question should be attempted at the same place.

			Marks																
Q.1	(a)	Consider different types of users in the Windows OS and explain the privilege escalation in the Windows OS.	05																
	(b)	What is Windows Integrity Control (WIC)? Also compare various levels of WIC with respect to trustworthiness	05																
	(c)	What is Operating System hardening? explain few examples	07																
Q.2	(a)	What are different file permissions in the windows OS?	05																
	(b)	With the help of example explain ipconfig and ifconfig?	05																
	(c)	Differentiate the Userspace and Kernel Spaces.	07																
Q.3	(a)	Consider the following scenario for the Windows Passwords.	08																
		<table border="1" style="width: 100%;"><thead><tr><th>S.No.</th><th>Username</th><th>Password</th><th>HASH</th></tr></thead><tbody><tr><td>01</td><td>User1</td><td>NFSQ_GOA_123</td><td>ASDEGHKJL0</td></tr><tr><td>02</td><td>User2</td><td>Nfsu_gandhinagr_456</td><td>ZXCVBNMP654</td></tr><tr><td>03</td><td>User3</td><td>NfSu</td><td>QWERTYUI321</td></tr></tbody></table>	S.No.	Username	Password	HASH	01	User1	NFSQ_GOA_123	ASDEGHKJL0	02	User2	Nfsu_gandhinagr_456	ZXCVBNMP654	03	User3	NfSu	QWERTYUI321	
S.No.	Username	Password	HASH																
01	User1	NFSQ_GOA_123	ASDEGHKJL0																
02	User2	Nfsu_gandhinagr_456	ZXCVBNMP654																
03	User3	NfSu	QWERTYUI321																
		<p>(i) With respect to the above table, comment on the password strength and security as per the standard policy and guidelines.</p> <p>(ii) Also identify the strong password from the above table and explain the possible attacks on the HASH</p> <p>(iii) How you will overcome this problem?</p>																	
Q.4	(b)	With the help of Windows Task Manager, answer the followings	08																
		<p>(i) Write step by step process to identify the suspicious process.</p> <p>(ii) Why is chrome process considered as the special case?</p>																	
		OR																	
		<p>Write a short note on Windows Logs.</p>																	

Risk management

5	Q.4	(a) What is cyber espionage? Also provide the example from recent cases. OR Explain any five windows and linux commands use for security incident respond	05
6	O	(b) What is the significance of <i>iptables</i> in the Linux hardening? Also provide the example. (c) You receive an email from your bank telling you there is a problem with your account. The email provides instructions and a link so you can log into your account and fix the problem. What should you do?	05 07
13	Q.5	(a) What is Information assurance (IA)? Also explain its five important pillars. OR Explain CHMOD, CHROOT and CHOWN in terms of Linux OS.	05
4		(b) What is Psychological Warfare? Also explain three types of propaganda.	05
7	o	(c) Define the process of salting. What is the use of salting? OR Write a note on sysinternals suite.	07
7	X	Q.6 (a) (i) How can an attacker <u>exploit</u> the rootkit attack? What is the use of loadable kernel modules (LKMs) in this attack? (ii) With the help of suitable example, explain the 80/20 rule of functionality? (b) Explain any case study on cyber warfare like critical infrastructure information breach incident by state sponsor attack groups.	08

END OF PAPER

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Prudipbhau

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. Cyber Security - Semester - I - Jan-2023

Subject Code: CTMSCS SI P2

Date: 09/01/2023

Subject Name: Cyber Security Audit and Compliance

5

Time: 11:00 – 14:00

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Phone's Remote Application

internal
externa

Q.1 (a) What is Access Control? Explain the effective solutions to implement this control.

Marks
04 (1)

(b) Define the following term.

04 (4)

- ✓ Risk Analysis
- ✓ Governance
- ✓ Compliances
- ✓ Risk Mitigation

(c) Explain the Operations Security control according to ISO 27000 standard in detail.

08 (4)

(d) Write a detailed note on COBIT5, 2004 ISACA, Principles

09 (3)

Q.2 (a) Explain SOC Compliance Reports briefly.

04 (4)

(b) State the difference between Guideline and Policy.

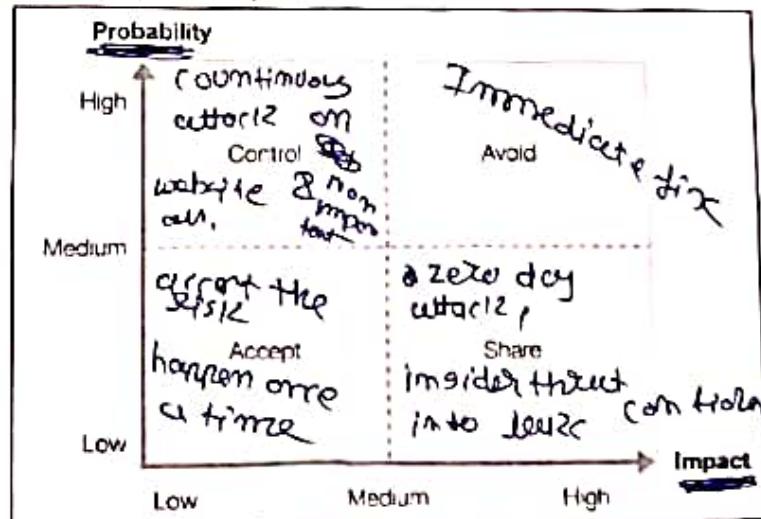
04 (4)

OR

(b) How to maximize C-I-A of workstation domain.

04 (7/6)

(c) Read the figure given below and explain all risk management strategies along with proper examples.



rols of IT Infrastructure with its risk.

09

following

04

ition of Information?
every Planning and its various strategies.

04

08

OR

anization Do to Be in Compliance?

08

e of BCP. → cp

09

of duties? → HR security

04

OR

J-A of LAN domain. → firewall, etc

04

various application control →

04

r, then explain the process of cyber security audit

08

of selecting and implementing effective controls in

09

OR

PR and its articles.

09

END OF PAPER

Seat No.: _____

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NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. (Cyber Security) - Semester -I- January 2023

Subject Code: CTMSCS SI P4 Date: 11/01/2023
 Subject Name: Artificial Intelligence bhu; Date: 11/01/2023
 Time: 11 AM TO 2 PM Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1 (a) Define an Intrusion Detection system (IDS). How can Machine learning be applied to IDS? 06

OR

Write a note on different types of Python libraries I. NumPy II. Pandas III. Matplotlib. Give at least TWO functions/methods from each library.

(b) Explain underfitting and overfitting. List one method each to avoid underfitting and overfitting.

(c) Explain in detail the Recurrent Neural Network along with its applications. 08

Q.2 (a) Explain the following terms using an example: 1) Mean 2) Median 3) Mode 4) Standard deviation and 5) Variance 06

OR

Solve the system of linear equation $x - 2y = 1$ and $3x + 2y = 11$.

(b) Explain ways to handle the missing values in data.

(c) Consider the following set of points of the form (x, y) : $\{(30, 60), (40, 80), (50, 100)\}$. Find the least square regression line for the given data points. Using resultant regression line predict the value of y when $x = 10$. 08

OR

Discuss in detail the various types of Machine learning models.

Q.3 (a) Consider the following training data for the Naive Bayes Classifier. 10

Chills	Runny nose	Headache	Fever	flu?
Y	N	Mild	Y	N
Y	Y	No	N	Y
Y	N	Strong	Y	Y
N	Y	Strong	Y	Y
N	N	No	N	N
N	Y	Strong	Y	Y
N	Y	Strong	N	N
Y	Y	Mild	Y	Y

Determine the class of the candidate ($\text{Flu} = Y$, $\text{Flu} = N$) for the following data. Show step by step execution.

Chills	Runny nose	Headache	Fever	flu
Y	N	Mild	Y	?

OR

- ~~(b)~~ Define cluster analysis. List and briefly explain types of Clustering. Discuss any ONE clustering algorithm. Explain in detail the Convolutional Neural Network architecture (CNN). List any two applications of CNN. Explain in brief the different types of layers in an Artificial Neural Network (ANN). Differentiate between single layer neural network and multi-layer neural network.
- 10 / 06
06 / 06
- ~~(a)~~ Q.4 (a) Define activation function and explain its importance. Explain any 4 activation functions in detail. Write a short note on Face Detection methods and list any two applications of face detection. Explain Anomaly detection using Machine learning.
- OR
06 / 08
08 / 08
- ~~(b)~~ (b) Define object tracking. List and discuss types of object tracking. Explain object tracking algorithm with an example.
- 06 / 08
08 / 08
- ~~(c)~~ (c) Q.5 (a) Illustrate with a help of an example the working of a Perceptron model. Define Image Segmentation. List and discuss various types of Image Segmentation.
- OR
06 / 06
06 / 06
- ~~(e)~~ (e) Explain in general the end-to-end steps in Natural Language Processing. Explain the Pattern Recognition process along with its Advantages and Disadvantages.

Compute any 8 values from the following True Positive, True Negative, False Positive, False Negative, Accuracy, Error Rate, Precision, Recall, Sensitivity, Specificity and F1-Score for the following confusion matrix

		Predicted		
		Positive	Negative	
Actual	Positive	1884 TP	47 FN	TP
	Negative	36 FP	1007 TN	FP
		1820	1054	FN
				END OF PAPER

$\frac{1884}{1884 + 47} = 0.931$
 $\frac{1007}{1007 + 36} = 0.943$
 $\frac{1884 + 1007}{1884 + 47 + 36 + 1007} = 0.974$

Input
convex,
looping?
The fully connected layer
Output

$\frac{11}{11}$	$\frac{11}{11}$	$\frac{12}{12}$
$\frac{36}{36}$	$\frac{47}{47}$	$\frac{1884}{1884}$
$\frac{1920}{1920}$	$\frac{521}{521}$	$\frac{1007}{1007}$
$\frac{47}{47}$	$\frac{42}{42}$	$\frac{47}{47}$
$\frac{521}{521}$	$\frac{1931}{1931}$	$\frac{36}{36}$
		$\underline{\underline{2974}}$

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NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I JAN 2023

Subject Code: CTMSCS S1 P3 2024 - Pradyip bha / Date: 13/01/2023

Subject Name: Web Application Security

Time: 11:00 AM to 2:00 PM

(T5) Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

(2c)

Write any five questions

- Q.1 (a) What is information gathering? Types of information gathering. 04 4
(b) Define CVE and CWE. 04 4
(c) Explain privilege Escalation and its type. 04 4
(d) Write about HTTP vs HTTPS 04 4
(e) Define Cookies and Sessions with example 04 4
(f) Define terms:-
-Vulnerability
-Threat
-Attack
-Shellcode.

(2d)

Write any two questions

- Q.2 (a) What is VAPT and Importance of vulnerability assessments? 12 12
(b) Explain Broken Authentication and Authorization 12 12
(c) Explain NMAP and Its Scanning Techniques. 12 12

(2e)

Write any four questions

- Q.3 (a) Explain google hacking and steps for google hacking. 08 6
(b) Explain Encoding and types of Encoding X 08 X
(c) Explain "Using Components with Known Vulnerabilities" with one scenario. 08 6 4
(d) Explain TCP header. 08 6 2
(e) Explain File Inclusion Vulnerability. ~ Parte 28, 10 sec 08 6 6

(2f)

Write any two questions

- Q.4 (a) Explain Security Misconfiguration and Sensitive Data Exposure. 12 0-2
(b) Write a note on Vulnerability assessment Security scanning process. 12 12
(c) What is CMS? And Why CMS Security is important. 12 8-2

(1g)

END OF PAPER

Timeline

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NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I - Jan-2023

Subject Code: CTMSCS-S1-P5 2024 - Pradip bhai Date: 17/01/2023

Subject Name: Introduction to Forensic Science and Law

Time: 11:00AM to 02:00PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Marks
Q.1	(a) Explain the terms "MODUS OPERANDI" and "CORPUS DELICTI"	05
	(b) Write short note on: <u>Central Finger Print Bureau (CFPB)</u> Or <u>Government Examiner of Questioned Document (GEQD)</u>	05
	(c) Briefly mention the duties of a Forensic Scientist.	07
Q.2	(a) What is Chain of Custody? Highlight the significance.	05
	(b) What is Narco-Analysis? Explain the procedure of conducting the test and also mention any two hypnotic drugs used for the same. Or <u>Explain the organizational set up of Central Forensic Science Laboratory.</u>	05
	(c) Elaborate about the various <u>tools & techniques</u> applied in the investigation of various <u>physical evidences</u> . Or <u>Explain the collection, packaging techniques and transportation of cyber evidences found on and recovered from a scene of crime.</u>	07
Q.3	(a) Schematically explain the types of courts in India. What kind of <u>criminal/civil cases</u> are being taken up by these courts and been given the conviction? Or What do understand by Cyber Crime? What are the recent fraudulent practices being opted by attackers/hackers/offenders to commit a cyber-frauds?	08
	(b) Write briefly on: i- <u>Section 320 IPC</u> <i>प्रविष्ट तथा</i> ii- <u>Section 304A IPC</u> iii- <u>Section 45A IEA</u> <i>दोष पत्र शाम</i>	08

Bruel

- (b) Consider the following confusion matrix of the win/loss prediction of cricket match. Calculate model accuracy, precision, recall and error rate for the same. 05

	Predicted Win	Predicted Loss
Actual Win	82	7
Actual Loss	3	8

- (c) Explain how can you apply Machine learning to Intrusion detection systems

OR

What is perceptron? Discuss Perceptron Learning Algorithm. 07

- Q.5** (a) What is computer vision? List out applications of computer vision. 05
 (b) Explain the role of Machine Learning in cyber security. 05
 (c) Explain Various Data Pre-Processing techniques 05

OR

Explain how ML works using an application scenario

- Q.6** (a) Explain the Malware Detection in cyber security? 08

OR

Explain in brief the different types of layers in an ANN?

Discuss difference between Biological Neuron vs Artificial Neuron

- (b) What is cluster analysis? How many types of clusters are available? Write a note on the k-means clustering method. 08

END OF PAPER

		iv- Section 138 ITA v- Section 293 CrPC vi- Section 291A CrPC vii- Section 66A IT ACT 2000 — not used now viii- Section 67B IT ACT 2000 idm & tchr	
Q.4	(a)	Explain the three major Crime Programmes run by the INTERPOL.	05 X
	(b)	Highlight the main differences between Cognizable and Non-Cognizable offences.	05
	(c)	Explain in detail the principles of Forensic Science.	07
Q.5	(a)	Explain in detail the components of a forensic science report.	05
	(b)	Elaborate Bailable offences and Non-Bailable offences with examples.	05
	(c)	Mention and thoroughly explain the several divisions or branches of Forensic Sciences.	07
Q.6	(a)	Explain the mentioned below: i- CCTNS ii- CDTS X iii- NCRB — Delhi X iv- NIA	08
	(b)	In a suspected murder case, the investigating officer recovered a 9-inch sharp knife near the victim's body. Blood stain produced by direct contact of knife blade was observed on the lower part of denim Jeans worn by the victim. Fingerprint expert listed blood-stained fingerprint from a table lying near the victim. An open running laptop along with a smartphone was also present on the table. On exiting the premises, the I.O observed a CCTV installed just outside the main door of the house. All exhibits were collected, sealed and sent for forensic analysis. Answer the following: i- What information can be furnished by bloodstained fingerprint present on the table? ii- The investigation in this case should be carried out under which sections of IPC? Also, explain the sections. ³⁰⁰ iii- Explain the recovery, preservation and examination the CCTV footage and other smart devices found from the scene of occurrence. iv- How will you establish the presence of attackers at the scene of crime considering the same scenario where CCTV footage and blood prints are not there present at the scene?	08

— END OF PAPER

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NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. (Cyber Security)- Semester -I-December 2022 - ATKT

Subject Code: CTMSCS SI P4**Date: 27/12/2022****Subject Name: Artificial Intelligence****Time: 11.00 am to 2.00 pm****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

						Marks												
Q.1	(a)	Write a note on different types of Python Libraries : I. NumPy II Pandas III Matplot				05												
OR																		
		Explain the basic commands of python with Examples?																
	(b)	Write a note on Machine Learning with its perspective and issues.				05												
	(c)	Explain in detail linear regression and how it can be used in prediction				07												
Q.2	(a)	Give the difference between supervised learning and unsupervised learning with suitable example.				05												
	(b)	Find mean square error for given data set. Also explain the cost function for the same.				05												
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr> <td>Y</td><td>3</td><td>4</td><td>2</td><td>4</td><td>5</td></tr> </table>						X	1	2	3	4	5	Y	3	4	2	4	5	
X	1	2	3	4	5													
Y	3	4	2	4	5													
OR																		
Define the following and also list out the real-time applications of each of them : (I) Artificial Intelligence (AI), (II) Machine Learning (ML), (III) Deep Learning (DL).																		
	(c)	Explain the Pattern Recognition process along with it's Advantages and Disadvantages				07												
Q.3	(a)	What is supervised learning? Explain any one supervised learning model in detail.				08												
	(b)	Explain RNN with its limitations. How LSTM can overcome the limitations of RNN. Explain with an example?				08												
OR																		
Explain in detail the building blocks of Convolutional Neural Network (CNN) architecture.																		
Q.4	(a)	Describe the learning procedure of Multi Layer Perceptron.				05												

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Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I ATKT- July-2022

Subject Code: CTMSCS SI P3

Date: 13/07/2022

Subject Name: Web Application Security

Time: 11.00AM to 2.00PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Write any five questions

- | | | |
|------------|---|--------------|
| Q.1 | (a) What is information gathering? types of information gathering. | Marks |
| | (b) Define CVE and CWE. | 04 |
| | (c) Explain privilege Escalation and its type. | 04 |
| | (d) What is Docker? Write a note on Advantages of docker. | 04 |
| | (e) Define Cookies and Sessions with example | 04 |
| | (f) Define terms:-
-Vulnerability
-Threat
-Attack
-Shellcode. | 04 |

Write any two questions

- | | | |
|------------|---|-----------|
| Q.2 | (a) What is VAPT and Importance of vulnerability assessments. | 12 |
| | (b) Explain Broken Authentication and Authorization | 12 |
| | (c) Explain NMAP and Its Scanning Techniques. | 12 |

Write any four questions

- | | | |
|------------|--|----|
| Q.3 | (a) What is IDOR? Explain in brief | 08 |
| | (b) What is Threat Modeling? Explain any two Models. | 08 |
| | (c) Explain "Using Components with Known Vulnerabilities" with one scenario. | 08 |
| | (d) Explain TCP header. | 08 |
| | (e) Explain File Inclusion Vulnerability. | 08 |

Write any two questions

- | | | |
|------------|---|-----------|
| Q.4 | (a) Explain Security Misconfiguration and Sensitive Data Exposure. | 12 |
| | (b) Write a note on Vulnerability assessment Security scanning process. | 12 |
| | (c) What is CMS? and Why CMS Security is important. | 12 |

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NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. Cyber Security - ATKT Exam - Semester - I - July-2022

Subject Code: CTMSCS-SI-P2

Date: 12-07-2022

Subject Name: Cyber Security Audit and Compliance

Time: 11:00 AM to 2:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1	Marks
(a) Explain SOC Compliance in brief. -	04
(b) State the difference(s) between policy and standard	04
(c) How to identify the proper security control for the protection?	08
OR	
(d) Discuss HR Security control according to ISO27000 in detail.	09
(d) Write a sample cyber security policy points and their requirements in industry.	09
Q.2	Marks
(a) What are the good sign of an auditor.	04
(b) Discuss various types of audit in brief.	04
(c) Illustrate the importance of IT Act in a system.	04
(d) Explain Risk Management in detail.	08
OR	09
Discuss Security rule of HIPAA in detail with all requirements.	
Q.3	Marks
(a) Discuss various types of assessment methods.	04
OR	
What is Access Control? Discuss the various techniques to implement this control in computer system.	
(b) What is logging and monitoring control.	04
(c) Write a note on COBIT-5.	08
(d) Discuss any realtime case study related to audit or assessment.	09
Q.4	Marks
(a) What are the goals of audit.	04
OR	
(b) List all 7 domains of IT infrastructure.	04
(c) Explain Business Impact Analysis.	04
(d) Write a detailed note on Business Continue Planning.	08
(d) Explain the risk(s) in all seven domains of IT infrastructure respectively.	09

Seat No.: _____

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NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I - ATKT Exam- December-2022

Subject Code: CTMSCS SI P2

Date: 26-12-2022

Subject Name: Cyber Security Audit and Compliance

Time: 11:00 AM to 02:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.-

		Marks
Q.1	(a) Discuss the importance of security control. (b) Draw and List 7 domains of IT Infrastructure. (c) Discuss the Business Continuity Planning in detail.	04 04 08
	OR	
	Explain Risk Analysis, Risk Assessment and Risk Management with example of any typical organization.	
	(d) Explain various types of DR sites in detail.	09
Q.2	(a) What are the various assessment methods? (b) Explain the difference between Audit and Assessment. (c) Write a note on HIPAA Act and its rules. (d) Write a compliance within Remote Access and Application Domain.	04 04 08 09
	OR	
	Write a detailed note on COBIT-5 and its enabling process.	
Q.3	(a) How you can maximize C-I-A in LAN Domain? (b) Explain GDPR in brief. (c) Explain Asset Management and Access Control in detail. (d) Write any case study related to auditing.	04 04 08 09
Q.4	(a) What are the goals of audit? (b) Explain the Risk Control Matrix in brief. (c) How to select any security control and its implementation in your organization? (d) Write the process of audit / assess any typical Data-Center as per Physical and Environmental control.	04 04 08 09

Q.6	(a)	<p>Define the sections:</p> <ul style="list-style-type: none">• Section 299 of Indian Penal Code• Section 300 of Indian Penal Code• Section 137 of Indian Evidence Code• Section 293 of Criminal Procedure Code <p>OR</p> <p>Write a note on Significance of Mobile Forensic Van in Forensic Investigations.</p>	08
	(b)	<p>Write short note on:</p> <ul style="list-style-type: none">• Bailable and Non-bailable Offences• Objectives of Punishment.	08

Seat No.: _____

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NATIONAL FORENSIC SCIENCES UNIVERSITY
B.Tech. - M.Tech. Computer Science & Engineering (Cyber Security)
Semester-02- December 2022,- ATKT

Subject Code: CTBTCSE SII P6**Date:** 23/ 12 / 2022**Subject Name:** Fundamentals of Forensic Sciences & Laws**Duration:** 03:00hrs (11:00 AM to 2:00 PM)**Total Marks:** 100**Instructions:**

1. Write down each answer on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Marks
Q.1	(a)	What is forensic science? Discuss the significance of forensic science.	05
	(b)	Write a note on different branches of forensic science.	05
	(c)	Write a detailed note on the principles and laws of forensic science with relevant examples.	07
Q.2	(a)	Define the following: i) Criminalistics ii) Evidence iii) Transient evidence iv) Trace evidence v) Arson	05
	(b)	Write short note on code of conduct of forensic scientists.	05
	(c)	Discuss any seven tools & techniques in Forensic Science with examples.	07
Q.3	(a)	Diagrammatically represent the Hierarchical setup of any State Forensic Science Laboratory in India. OR Diagrammatically represent the Hierarchical setup of Directorate of Forensic Science Services (DFSS) in India.	08
	(b)	Briefly explain national and international organizations involved in crime investigation.	08
Q.4	(a)	Briefly explain the format of Report writing in Forensic Lab.	05
	(b)	Explain any five types of samples received in Forensic Physics division of a Forensic Science Laboratory.	05
	(c)	Write short note on Mobile Crime Laboratories and their significance on a crime scene. OR Write a note on various devices used for digital forensics.	07
Q.5	(a)	Write a note on five scientists involved with forensic science.	05
	(b)	Explain any five types of samples received in Biology division of a Forensic Science Laboratory.	05
	(c)	Explain what is copyright and discuss any one case-study related to Copyright Infringement.	07

Q.4 (a) Briefly explain the setup and role of INTERPOL OR FBI in National criminal investigation (5)
(b) Match the following notable scientists with their contributions in Forensic Science: (5)

a)	Mathieu Orfila	i)	Principles of Forensic Science
b)	Calvin Goddard	ii)	Forensic Toxicology
c)	Edmond Locard	iii)	Restoring dried blood stains for blood grouping
d)	Hans Gross	iv)	Questioned Documents
e)	Leone Lattes	v)	Forensic Ballistics.

(c) Write short note on Qualifications of Forensic Scientist (7)

Q.5. (a) Explain role of allied organizations like (GEQD) OR National Investigative Agency. (7)

(b) Write short note on: (8)

i) National Crime Record Bureau (8)

ii) Diagrammatically represent the hierachal organization of a Central Forensic Science Lab in India.

Q.6 (a) Explain copyright and Discuss any one case-study related to copyright Infringement. (5)

(b) Explain Patent and Discuss any one case-study related to Patent Infringement. (5)

(c) Write a brief note on IT Act 2000 and explain any three sections along with their punishments (7)

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Tech Cyber Security , Semester - I
ATKT Exam, July 2022

Subject Code: CTMTCS SI P5

Date: 14/07/2022

Subject Name: Introduction to Forensic Science and Law

Time: 3:00hrs (11:00 AM to 02:00 PM)

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1 (a) What are physical evidences. Write down the different crime scene evidence searching methods. (8)

(b) Explain:

- i) Modus Operandi (8)
- ii) Non-Bailable Offence
- iii) Circumstantial Evidence with example
- iv) Copyright Act

Q.2 (a) Mention the different branches of forensic science and the cases they deal with. (5)

(b) The Role of Mobile Forensic Van at Crime scene (5)

(c) Write down the basic principles of Forensic Science. (7)

Q.3 (a) Describe: (5)

- i) Write down 7 S's of Crime Scene.
- ii) Cognizable and non-cognizable offences in Criminal law

(b) Define the following: (5)

- i) Sec 300 of Indian Penal Code
- ii) Sec 304B of Indian Penal Code
- iii) Sec 320 of Indian Penal Code
- iv) Sec 45 of Indian Evidence Act
- v) FIR

OR

Write a short note on:

- (i) Expert Witness and Expert Opinion
- (ii) Objectives of Punishment.

(c) Write down different forms of Punishment in detail. (7)

Q.4	(a)	Write a short note on Interpol?	05
	(b)	Write a short note on GEQD?	
	(c)	Differentiate between Criminal Justice System & Civil Justice System? OR Differentiate between cognizable and Non-cognizable offences?	
Q.5	(a)	List various types of storage media used in computers?	05
	(b)	Briefly explain different forms of cybercrime.	
	(c)	Explain Section 66C and 66D of IT Act 2000? OR Explain Trademark and Patent?	
Q.6	(a)	Explain the hierarchy of courts in India. OR Describe any eight branches of Forensic Science with examples?	08
	(b)	Explain in detail the steps involved in Crime scene Investigation with examples?	

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security– Semester I
(ATKT Semester End Examination) – (July-2022)

Subject Code: CTMSCS S1 P5

Date: 14/07/22

Subject Name: Introduction to Forensic Science and Law

Total Marks: 100

Time: 11:00 AM – 02:00PM

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Marks
Q.1	(a)	Give a note on section 45 of Indian Evidence Act.	05
	(b)	Explain Section 43 of IT Act? OR Name the following IPC Sections: 304B, 339, 390, 405, and 499?	05
	(c)	Explain the principles of forensic science. Give an example for each of them.	07
Q.2	(a)	Enlist the components of scientific report writing?	05
	(b)	Describe about examination of witnesses in criminal proceedings?	05
	(c)	What do you understand by FIR and Case Diary? Mention its importance.	07
Q.3	(a)	Define Punishment. Explain the different types of punishment given in India with examples	08
	(b)	Explain Copyright & Copyright infringement Act?	08

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I - March-2022

Subject Code: CTMSCS SIP2
Subject Name: Cyber Security Audit and Compliance

Date: 15-03-2022
 Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1	Marks
(a) What are the various assessment methods?	04
(b) List the 7 domains of IT Infrastructure.	04
(c) Discuss the details of IT audit process with CAAT perspective.	08
OR	
(d) Explain Risk Analysis, Risk Assessment and Risk Management with example of any typical organization.	
(e) What is Disaster Recovery site? Explain various types of DR sites.	
OR	
(f) State section 66 along with its subsections of Indian IT Act.	04
(g) Explain the process and factor(s) for the selection of any standard for your any organization.	04
(h) Write a note on HIPAA Act and its rules.	08
(i) You are working as an IT Manager in a Bank and you have to take a downtime as you are shifting from server 2016 to 2020 because there was a series of serious vulnerabilities in server 2016 and the support from the vendor has been ended that forces you to move to server 2020. This is a change in the infrastructure, while shifting from old to new server what are the things you should take care of to be in the compliance	09
OR	
Write a detailed note on COBIT-5 and its enabling process.	
OR	
(a) How you can maximize C-I-A in LAN Domain?	04
OR	
(b) Discuss the importance of security control.	
(c) Explain the difference between SOC Type - 1, 2 and 3 reports.	04
(d) Explain operations security of ISO 27002.	08
(e) Write a detailed note on Business Continuity Planning.	09
OR	
(a) What are the goals of audit?	04
OR	
(b) What is the scope of an IT compliance audit?	
(c) Explain the audit as risk based approach.	04
(d) Discuss the process for selection of any security control and its implementation in your organization.	08
(e) Write the process of audit / assess any typical Data-Center as per Physical and Environmental control.	09

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Digital Forensics and Information Security - Semester - I - March-2022

Subject Code: CTMSDFIS SI P2**Date: 15-03-2022****Subject Name: Cyber Security Audit and Compliance****Time: 11:00 AM to 02:00 PM****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Marks
Q.1	(a) What are the various assessment methods? (b) List the 7 domains of IT Infrastructure. (c) Discuss the details of IT audit process with CAAT perspective.	04 04 08
	OR	
	Explain Risk Analysis, Risk Assessment and Risk Management with example of any typical organization.	
	(d) What is Disaster Recovery site? Explain various types of DR sites.	09
Q.2	(a) State section 66 along with its subsections of Indian IT Act. (b) Explain the process and factor(s) for the selection of any standard for your any organization. (c) Write a note on HIPAA Act and its rules. (d) You are working as an IT Manager in a Bank and you have to take a downtime as you are shifting from server 2016 to 2020 because there was a series of serious vulnerabilities in server 2016 and the support from the vendor has been ended that forces you to move to server 2020. This is a change in the infrastructure, while shifting from old to new server what are the things you should take care of to be in the compliance.	04 04 08 09
	OR	
	Write a detailed note on COBIT-5 and its enabling process.	
Q.3	(a) How you can maximize C-I-A in LAN Domain?	04
	OR	
	Discuss the importance of security control.	
	(b) Explain the difference between SOC type – 1, 2 and 3 reports. (c) Explain operations security of ISO 27002. (d) Write a detailed note on Business Continuity Planning.	04 08 09
Q.4	(a) What are the goals of audit?	04
	OR	
	What is the scope of an IT compliance audit?	
	(b) Explain the audit as risk based approach. (c) Discuss the process for selection of any security control and its implementation in your organization. (d) Write the process of audit / assess any typical Data-Center as per Physical and Environmental control.	04 08 09

National Forensic Sciences University
School of Cyber Security and Digital Forensics
M.Sc. Cyber Security (Semester I)
Semester End Examination (March 2022)

Subject Code: CTMSCS SI P1

Subject Name: Essentials of Cyber Security and Cyber Warfare

Total Marks: (100)

Date: 14/03/2022

Time: 11:00 to 14:00

Instructions:

1. Figures to the right indicate full marks.
2. Do as directed.

Q.1 Write a brief answer of following question. (Any Eight)

Marks: 4x8 = 32 Marks

1. Explain the difference between IT Infrastructure and Network Infrastructure.
2. Write a brief note on latest trends in cybercrimes.
3. What do you mean by malicious software? Explain.
4. Explain any five windows commands which can be used in cyber security.
5. How IDS and IPS is working? Explain.
6. Write a note on types of networks.
7. What is user account policy?
8. Explain the term security audit of an Operating System?
9. What do you mean by system hardening? Explain with an example.
10. Explain any five functionality to secure windows operating system.

Q.2 Write detailed answer of following question. (Any Four)

Marks: 8x4 = 32 Marks

1. Explain various types of digital data and its categorization in terms of cybercrime, cyber security and cyber forensics.
2. What do you mean by data breach? Suggest some cyber security measures to prevent data breach.
3. Explain windows event logs and its types in detail.
4. Explain different types of firewall with example. Also explain concept of Next Gen Firewall.
5. Explain any four sysinternal utility with an example.
6. Explain windows registry in detail with example.

Q.3 Write detailed answer of following question. (Any Four)

Marks: 9x4 = 36 Marks

1. Explain the terms data recovery and data carving with appropriate technical understanding.
2. Write ten suggestions for better cyber security for any small and medium scale organization.
3. Explain any five windows group policy with an appropriate example.
4. What do you mean by network sniffing? Explain PCAP in detail. Also explain various methodology to analyze the network packets.
5. Explain Cyber warfare with types and different examples.
6. Explain case study on cyber warfare.

Q.6 (a) Define the role of ML in the domain of cyber security by depicting different types of attacks. 08

OR

How Intrusion Detection can be managed by ML techniques? Explain in detail. 08

(b) Explain Logistic Regression with an example. Where will it be used? 08

OR

Explain social engineering attacks? Enlist its types with example. 08

END OF PAPER

Scene Investigation with

08

08

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security (W.E.F. 2021) - Semester - I - March-2022

Subject Code: CTMSCS SI P5**Date: 21/03/2022****Subject Name: Introduction to Forensic Science and Law****Time: 11:00am to 2:00pm****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1	(a) Write a brief note on sections: 66A, 66B, 66C, 66D and 66E?	Marks
	(b) Explain Section 43?	05
	(c) Explain Trademark and Patent?	05
Q.2	(a) Differentiate between cognizable and Non-cognizable offences?	05
	(b) What do you understand by culpable homicide not amounting to murder?	05
	OR Describe the organizational structure of Police?	05
Q.3	(c) What do you understand by FIR and Case Diary? Mention its importance.	07
	(a) Define Punishment. Explain the different types of punishment given in India with examples?	08
	OR Explain in detail about the services provided by the Forensic Sciences Laboratory?	08
Q.4	(b) Explain Copyright & Copyright infringement Act?	08
	(a) Describe about examination of witnesses in criminal proceedings?	05
	OR (b) Write a short note on NIA?	05
	(c) Write a short note on BPR&D?	05
	OR Write a short note on Interpol and FBI?	07

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. (Cyber Security) - Semester - I - March - 2022

Subject Code: CTMSCS SI P4**Date: 16/03/2022****Subject Name: Artificial Intelligence****Total Marks: 100****Time: 11:00 AM to 2:00 PM****Instructions:**

1. Write down each question on a separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Marks
Q.1	(a) Define the term (any 5)	05
	1. Tuple 2. Training set 3. SVM 4. Perceptron 5. Data cleaning 6. Confusion matrix	
	(b) What is Machine Learning? Explain its perspective and issues.	05
	(c) Describe various types of Machine Learning methods. Explain any one supervised algorithm with an example of a spam filter.	07
	OR	
	1. Differentiate: Classification v/s Prediction Model. 2. What is Artificial Intelligence? Describe its growth and sub-domains.	03 04
Q.2	(a) Write a note on Artificial Neural Network with its function and applications.	05
	(b) What is the use of backpropagation? How is it advantageous over the feed forward method?	05
	(c) Describe the learning procedure of Multi Layer Perceptron. How does average pooling and max pooling work in Convolutional Neural Network?	07
	OR	
	Explain RNN with its disadvantages. How LSTM can overcome the limitations of RNN. Explain with example.	07
Q.3	(a) 1. How Computer Vision works? Enlist its applications. 2. Compare and contrast supervised and unsupervised learning methods in context to training and validation dataset.	04 04

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Tech. Cyber Security
 Semester – I – May - 2024

Subject Code: CTMTCS S1 P5**Date: 03/05/2024****Subject Name: Introduction to Forensic Science and Law****Time: 2:00 PM to 5:00 PM****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Marks
Q.1		Attempt any three.	
	(a)	Define Copyright and delineate Copyright violation through a relevant case-study.	08
	(b)	Write short notes on (a) Fingerprint Bureaus (b) Police academies	08
	(c)	Explore the myriad tools and techniques utilized across diverse domains within forensic science.	08
	(d)	Explore the various forms of data representation, elucidating each with illustrative examples.	08
Q.2		Attempt any three.	
	(a)	Define Patent and analyze exclusions under Sections 3 and 4 of the Patents Act 1970.	08
	(b)	Elaborate on the distinctions between Civil and Criminal Justice systems.	08
	(c)	Explore Legal implications of Sections related to: <ol style="list-style-type: none"> i. Punishment for sending offensive messages through communication service ii. Punishment for dishonestly receiving stolen computer resource or communication device. iii. Punishment for identity theft. iv. Punishment for cheating by personation by using computer resource. v. Punishment for violation of privacy 	08
	(d)	Define and differentiate between Cognizable Offences, Non-Cognizable Offences, Bailable Offences, and Non-Bailable Offences.	08
Q.3		Attempt any three.	
	(a)	Describe all the fundamental principles of forensic science.	08

- (ii) Objectives of Punishment.
- (c) Explain murder and culpable homicide under section 299 and 300 of IPC (7)
- Q.5 (a) List of various types of storage media used in computers. (5)
- (b) Briefly explain different forms of cybercrime. (5)
- (c) Explain section 66C and 66D of IT Act 2000. (7)
- Q.6 (a) What are physical evidences, briefly explain the various methods for search of these evidences. (8)
- (b) Explain:
i) Transient evidences
ii) Examination-in-chief
iii) Cross-examination of witnesses
iv) Copyright Act (8)

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Digital Forensics and Information Security - Semester - I - March-2022

Subject Code: CTMSDFIS SI P5

Date: 21/03/2022

Subject Name: Introduction to Forensic Science and Law

Time: 3:00hrs

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

- Q.1 (a) Explain functions of a Forensic Scientist in scientific investigation of crime. (5)
(b) Write about any two notable scientists with their contributions in Forensic Science. (5)
(c) Briefly explain principles of Forensic Science. (7)
- Q.2 (a) Explain the scientific procedure followed during report making. (5)
(b) Briefly explain any five techniques utilized in Forensic investigation with examples OR Mention about any five branches of Forensic science along with the type of cases these divisions receives and examines. (5)
(c) Explain the setup of FBI OR INTERPOL (7)
- Q.3 (a) Explain role of allied organizations like Central Fingerprint Bureau OR National Crime Records Bureau in criminal investigation. (8)
(b) Write short note on:
i) Mobile Forensic Van and its utilization in Forensic investigation.
ii) Hierachal organization of CFSL/ FSL in India OR Hierachal organisation of courts in India. (8)
- Q.4 (a) Describe:
i) Cognizable and Non-cognizable offences
ii) Bailable and Non-bailable offences in Criminal law (5)
(b) Define the sections:
i) Sec 135 of Evidence Act
ii) Sec 136 of Evidence Act
iii) Sec 137 of Evidence Act
iv) Sec 319 of Indian Penal Code
v) Sec 320 of Indian Penal Code (5)
OR
Write a short note on:
(i) Primary and Sanctioning Rights

	(b)	Write short notes on (a) National Crime Records Bureau (b) Bureau of Police Research and Development	08
	(c)	Illustrate the distinct branches of forensic science by giving pertinent examples of evidence and cases encountered within each field.	08
	(d)	Illustrate the hierarchical structure of Central and State Forensic Science Laboratories.	08
Q.4	Attempt any two.		
	(a)	Give an overview of the historical development of forensic science within India.	07
	(b)	Highlight the crucial significance of ethics for a forensic scientist.	07
	(c)	Elaborate the process of report writing.	07
Q.5	Attempt any two.		
	(a)	Examine Trademarks in detail.	07
	(b)	Define Plaintiff, Defendant, Litigation, Verdict, Appeal, Evidence, and Trial, elucidating their legal significance.	07
	(c)	Discuss the significance of the Information Technology (IT) Act 2000 in regulating cyberspace.	07

--- End of Paper---



Q.4 *Attempt any two.*

- (a) Discuss Section 43 of IT Act 2000 with appropriate case-study.
(b) Discuss Section 66A,66B,66C,66D,66E.
Q.5 *Attempt any two.*

- (c) Explain the following terms: Plaintiff, Defendant, Litigation, Verdict, Appeal, Evidence, Trial.
(d) Elaborate the process of report writing.
(e) Enlighten the importance of ethics in the life of a forensic scientist.
(f) Provide insights into the history of forensic science in India.

— End of Paper--

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. Cyber Security
Semester - I - January - 2024

Subject Code: CTMSCS SI PS

Date: 10/01/2024

Subject Name: Introduction to Forensic Science and Cyber Law

Time: 2:00 PM to 5:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1	Attempt any three.	Marks
(a)	Enlist various tools and techniques in different fields of forensic science.	08
(b)	Write short notes on (a) NIA (b) CCTNS	08
(c)	Describe different fields of forensic science with relevant examples of evidences and cases received in them.	08
(d)	How can data be represented in different forms? Explain with examples.	08
Q.2	Attempt any three.	
(a)	Describe hierarchical setup of Central and State Forensic Science Laboratories.	08
(b)	Explain all the fundamental principles of forensic science and their respective significance in detail.	08
(c)	Write short notes on (a) Bureau of Police Research and Development (b) Fingerprint Bureaus	08
(d)	Discuss the difference between Civil and Criminal Justice.	08
Q.3	Attempt any three.	
(a)	Explain Copyright and Copyright infringement with appropriate case-study.	08
(b)	Explain Patent and Discuss what cannot be patented under Section 3 and 4 of Patents Act 1970.	08
(c)	Discuss Trademarks.	08
(d)	Explain the following terms: Cognizable Offences, Non-Cognizable Offences, Bailable Offences, Non-Bailable Offences.	08

Q.4	Attempt any two.	
(a)	Elaborate the process of report writing.	07
(b)	Enlighten the importance of ethics in the life of a forensic scientist.	07
(c)	Provide insights into the history of forensic science in India.	07
Q.5	Attempt any two.	
(a)	Discuss Section 43 of IT Act 2000 with appropriate case-study.	07
(b)	Discuss Section 66A,66B,66C,66D,66E.	07
(c)	Explain the following terms: Plaintiff, Defendant, Litigation, Verdict, Appeal, Evidence, Trial.	07

-- End of Paper--

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Tech. Cyber Security
Semester - I - January - 2024

Subject Code: CTMTCS SI P5**Date: 10/01/2024****Subject Name: Introduction to Forensic Science and Law****Total Marks: 100****Time: 2:00 PM to 5:00 PM****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

	Marks
Q.1	Attempt any three.
(a)	08
(b)	08
(c)	08
(d)	08
Q.2	Attempt any three.
(a)	08
(b)	08
(c)	08
(d)	08
Q.3	Attempt any three.
(a)	08
(b)	08
(c)	08
(d)	08

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
MSc Digital Forensics and Information Security
Semester - I - January - 2024

Subject Code: CTMSDFIS S1 P5

Date: 10.01.2024

Subject Name: INTRODUCTION TO FORENSIC SCIENCE AND CYBER LAWS

Time: 2:00 PM to 5:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

S. No.

Marks

Q.1

Attempt any three.

- (a) Describe about various computer storage devices and list out the volatile vs non-volatile memory difference. 08
- (b) What is Interpol/FBI, explain its role in international criminal investigations. 08
- (c) Explain the scope of any four type of analysis undertaken in Forensic Biology division. 08
- (d) What is IPC, explain the sections 299, 300, 375 & 377. 08

Q.2

Attempt any three.

- (a) Discuss Sec-66 of IT Act, 2000 with appropriate case-study. 08
- (b) Write a note on establishment of Fingerprint Bureau. 08
- (c) Explain about the various objectives of punishment. 08
- (d) Explain any four basic principles as followed in forensic science citing relevant illustrations. 08

Q.3

Attempt any three.

- (a) Define the following:
i) Criminalistics 08
ii) Physical evidence
iii) Law
iv) Mobile Laboratory

	(b)	Discuss very preciously, as pen-tester when to use sniper, Battering ram, Pitchfork, Cluster bomb during web application security pen-testing with situations.
	(c)	How to bypass authentication and authorization using burp suite / OWASP zed attack proxy (ZAP)? explain with example.
Q.5		Answer the following question (Attempt any two)
	(a)	Discuss in brief CMS and Docker containers security.
	(b)	Discuss Auth Tokens and IDOR with example.
	(c)	Discuss APIs and Insecure data storage with example.

--- Best of Luck---

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M. Tech Cyber Security
Semester – I, January - 2023

Subject Code: CTMTCS SI P4**Date:** 11/01/2024**Subject Name:** Application Security and VAPT**Time:** 11:00 AM to 2:00 PM**Total Marks:** 100**Instructions:**

1. Write down each question on separate page.
2. Make suitable assumptions wherever necessary.
3. Write answer very precisely and to the point.

		Marks
Q.1	Answer the following question (Attempt any three)	[24]
(a)	Discuss SQL Injection with example	08
(b)	Discuss XSS with example and also discuss defense strategy.	08
(c)	Discuss File Inclusion with scripting / code example.	08
(d)	Why XXS is consider as dangerous vulnerability? and what will be the defense strategy.	08
Q.2	Answer the following question (Attempt any three)	[24]
(a)	Discuss various techniques of web server fingerprinting with example.	08
(b)	Discuss the role of session and cookies in the web application security pen-testing.	08
(c)	Explain the HTTP protocol with example. Write three points related to HTTP protocol which pen-tester advice to consider for efficient web application security pen-testing.	08
(d)	Why sub-domain and virtual host enumeration is important in the pen-testing? Explain with example and also discuss various techniques to enumerate sub-domain and virtual host.	08
Q.3	Answer the following question (Attempt any three)	[24]
(a)	Discuss CVE with example and how pen-tester will use it during the pen-testing of web application.	08
(b)	False positiv is the biggest issue for the pen-tester while doing web application pen-testing. discuss the steps that pen-tester is advice to follow to tackle these issues.	08
(c)	What is threat, threat modeling and threading modeling assessment? Discuss the thread model which focuses on identifying and rating potential attack vectors with example.	08
(d)	Discuss the REST concepts and discuss the steps to secure the REST web service communication.	08
Q.4	Answer the following question (Attempt any two)	[14]
(a)	Discuss very precisely, as pen-tester when to use intruder, repeater and decoder with situations.	07

- (b) Explain what are the primary and secondary functions of court of law.
(c) Explain the role of any four techniques with their tools used for forensic investigations.
(d) Explain the scope of any four type of analysis undertaken in Forensic Biology division.

Q.4

Attempt any two.

- (a) Differentiate between Cognizable and Non-cognizable offences. **07**
(b) What is a State Central Forensic Science Laboratory, explain its hierarchical setup with diagrammatic representation. **07**
(c) Write a note on significance of forensic science in a society. **07**

Q.5

Attempt any two.

- (a) What is NIA, explain its role as an allied organization to forensic science. **07**
(b) Discuss the difference between Civil and Criminal Justice. **07**
(c) You are given a digital evidence for analysis, prepare a report of analysis for the same. **07**

*** End of Paper ***

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. (Cyber Security) - Semester -I - January 2023

Subject Code: CTMSCS SI P4

Subject Name: Artificial Intelligence

Time: 11 AM TO 2 PM

Date: 11/01/2023

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1 (a) Define an Intrusion Detection system (IDS). How can Machine learning be applied to IDS? **Marks** **06**

OR

Write a note on different types of Python libraries: I. NumPy II. Pandas III. Matplotlib. Give at least TWO functions/methods from each library.

(b) Explain undersetting and oversetting. List one method each to avoid undersetting and oversetting. **06**

(c) Explain in detail the Recurrent Neural Network along with its applications. **08**

Q.2 (a) Explain the following terms using an example: 1) Mean 2) Median 3) Mode 4) Standard deviation and 5) Variance **06**

OR

Solve the system of linear equation $x - 2y = 1$ and $3x + 2y = 11$.

(b) Explain ways to handle the missing values in data. **06**

(c) Consider the following set of points of the form (x, y) : $\{(30, 60), (40, 80), (50, 100)\}$. Find the least square regression line for the given data points. Using resultant regression line predict the value of y when $x = 10$.

OR

Discuss in detail the various types of Machine learning models.

Q.3 (a) Consider the following training data for the Naive Bayes Classifier. **10**

chills	runny nose	headache	fever	flu?
Y	N	Mild	Y	N
Y	Y	No	N	Y
Y	N	Strong	Y	Y
N	Y	Mild	Y	Y
N	N	No	N	N
N	Y	Strong	Y	Y
N	Y	Strong	N	N
Y	Y	Mild	Y	Y

Determine the class of the candidate ($\text{Flu} = \text{Y}$ / $\text{Flu} = \text{N}$) for the following data. Show step by step execution.

Chills	Runny nose	Headache	Fever	flu
Y	N	Mild	Y	?

OR

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Digital Forensics an Information Security - Semester - I - Jan-2023

Subject Code: CTMSDFIS SI P2

Date: 09/01/2023

Subject Name: Cyber Security Audit and Compliance

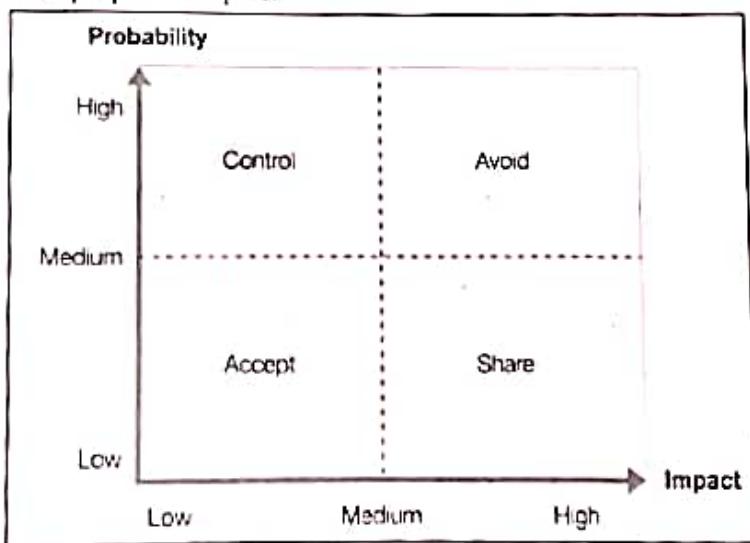
Time: 11:00 – 14:00

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Marks
Q.1	(a) What is Access Control? Explain the effective solutions to implement this control.	04
	(b) Define the following term. • Risk Analysis • Governance • Compliances • Risk Mitigation	04
	(c) Explain the Operations Security control according to ISO 27000 standard in detail.	08
	(d) Write a detailed note on COBIT5.	09
Q.2	(a) Explain SOC Compliance Reports briefly.	04
	(b) State the difference between Guideline and Policy.	04
	OR	
	(b) How to maximize C-I-A of workstation domain.	04
	(c) Read the figure given below and explain all risk management strategies along with proper examples.	08



Q.4	<p>(a) What is cyber espionage? Also provide the example from recent cases. OR Explain any five windows and linux commands use for security incident respond.</p>
	<p>(b) What is the significance of <i>iptable</i> in the Linux hardening? Also provide the example. (c) You receive an email from your bank telling you there is a problem with your account. The email provides instructions and a link so you can log into your account and fix the problem. What should you do?</p>
Q.5	<p>(a) What is Information assurance (IA)? Also explain its five important pillars. OR Explain CHMOD, CHROOT and CHOWN in terms of Linux OS.</p>
	<p>(b) What is Psychological Warfare? Also explain three types of propaganda. (c) Define the process of salting. What is the use of salting? OR Write a note on sysinternals suite.</p>
Q.6	<p>(a) (i) How can an attacker exploit the rootkit attack? What is the use of loadable kernel modules (LKMs) in this attack? (ii) With the help of suitable example, explain the 80/20 rule of functionality? (b) Explain any case study on cyber warfare like critical infrastructure information breach incident by state sponsor attack groups.</p>

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I JAN 2023

Subject Code: CTMSCS SI P3

Date: 13/01/2023

Subject Name: Web Application Security

Time: 11:00 AM to 2:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Write any five questions	Marks
Q.1	(a)	What is information gathering? Types of information gathering.	04
	(b)	Define CVE and CWE.	04
	(c)	Explain privilege Escalation and its type.	04
	(d)	Write about HTTP vs HTTPS	04
	(e)	Define Cookies and Sessions with example	04
	(f)	Define terms:- -Vulnerability -Threat -Attack -Shellcode.	04
		Write any two questions	12
Q.2	(a)	What is VAPT and Importance of vulnerability assessments?	12
	(b)	Explain Broken Authentication and Authorization	12
	(c)	Explain NMAP and Its Scanning Techniques.	12
		Write any four questions	08
Q.3	(a)	Explain google hacking and steps for google hacking.	08
	(b)	Explain Encoding and types of Encoding.	08
	(c)	Explain "Using Components with Known Vulnerabilities" with one scenario.	08
	(d)	Explain TCP header.	08
	(e)	Explain File Inclusion Vulnerability.	08
		Write any two questions	12
Q.4	(a)	Explain Security Misconfiguration and Sensitive Data Exposure.	12
	(b)	Write a note on Vulnerability assessment Security scanning process.	12
	(c)	What is CMS? And Why CMS Security is important.	12

END OF PAPER

- Define cluster analysis. List and briefly explain types of Clustering. Discuss any ONE clustering algorithm. 06
- (b) Explain in detail the Convolutional Neural Network architecture (CNN). List any two applications of CNN. 06
- Q.4** (a) Explain in brief the different types of layers in an Artificial Neural Network (ANN). Differentiate between single layer neural network and multi-layer neural network. 06
- OR**
- Define activation function and explain its importance. Explain any 4 activation functions in detail. 04
- (b) Write a short note on Face Detection methods and list any two applications of face detection. 06
- (c) Explain Anomaly detection using Machine learning. 08
- OR**
- Define object tracking. List and discuss types of object tracking. Explain object tracking algorithm with an example. 08
- Q.5** (a) Illustrate with a help of an example the working of a Perceptron model. 06
- (b) Define Image Segmentation. List and discuss various types of Image Segmentation. 06
- OR**
- Explain in general the end-to-end steps in Natural Language Processing. 06
- (c) Explain the Pattern Recognition process along with its Advantages and Disadvantages. 08
- OR**
- Compute any 8 values from the following True Positive, True Negative, False Positive, False Negative, Accuracy, Error Rate, Precision, Recall, Sensitivity, Specificity and F1-Score for the following confusion matrix. 08

		Predicted	
		Positive	Negative
Actual	Positive	1884	47
	Negative	36	1007

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. -CS - Semester -I - Jan-2022

Subject Code: CTMSCS SI P1

Date: 05/01/2023

Subject Name: Essentials of Cyber Security and Cyber Warfare

Time: 3 Hours

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Parts of question should be attempted at the same place.

Q.1	(a)	Consider different types of users in the Windows OS and explain the privilege escalation in the Windows OS.	Marks																
			05																
Q.2	(b)	What is Windows Integrity Control (WIC)? Also compare various levels of WIC with respect to trustworthiness.	05																
Q.2	(c)	What is Operating System hardening? explain few examples.	07																
Q.3	(a)	What are different file permissions in the windows OS? With the help of example explain ipconfig and ifconfig? Differentiate the Userspace and Kernel Spaces.	05 05 07																
Q.3	(a)	Consider the following scenario for the Windows Passwords: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>S.No.</th> <th>Username</th> <th>Password</th> <th>HASH</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>User1</td> <td>NFSU_GOA_123</td> <td>ASDFGHJKLM987</td> </tr> <tr> <td>02</td> <td>User2</td> <td>Nfsu_gandhinagr_456</td> <td>ZXCVBNMP654</td> </tr> <tr> <td>03</td> <td>User3</td> <td>NfSu</td> <td>QWERTYUI321</td> </tr> </tbody> </table> (i) With respect to the above table, comment on the password strength and security as per the standard policy and guidelines. (ii) Also identify the strong password from the above table and explain the possible attacks on the HASH. (iii) How you will overcome this problem?	S.No.	Username	Password	HASH	01	User1	NFSU_GOA_123	ASDFGHJKLM987	02	User2	Nfsu_gandhinagr_456	ZXCVBNMP654	03	User3	NfSu	QWERTYUI321	08
S.No.	Username	Password	HASH																
01	User1	NFSU_GOA_123	ASDFGHJKLM987																
02	User2	Nfsu_gandhinagr_456	ZXCVBNMP654																
03	User3	NfSu	QWERTYUI321																
Q.3	(b)	With the help of Windows Task Manager, answer the followings: (i) Write step by step process to identify the suspicious process. (ii) Why is chrome process considered as the special case? OR Write a short note on Windows Logs.	08																

		Draw the overview of organizational and hierarchical structure of any FSL in India.	
	(b)	Highlight the objectives and functions of: i. NIA ii. BPRD	05
Q.4	(a)	Write about any 5 types of digital storage media types where digital evidences can be found.	05
	(b)	What are the primary and secondary functions of law, explain in brief.	05
	(c)	Write a note on significance of INTERPOL and its role in international criminal investigation. OR Discuss about the objectives of punishment.	07
Q.5	(a)	What are the three basic duties of a Forensic Scientist. OR Describe the hierarchy of criminal courts in India.	05
	(b)	Write a short note on the Mobile Crime Laboratories and the type of kits available in one.	05
	(c)	What should be the model code of conduct of a Forensic Scientist, explain any 7 qualities.	07
Q.6	(a)	Define the following terms: i. Forensic Science ii. Physical evidence iii. Modus Operandi iv. Computer network v. Cyber security vi. Public and Private key vii. Information Access	08
	(b)	Name the scientist and the application of the below contributions. i. Chemical analysis of viscera ii. Physical measurement of Humans iii. Blood grouping iv. Comparison microscope	08

END OF PAPER

Seat No.: _____

Enrolment No.: _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc DFIS- Semester - I - June-2023

Subject Code: CTMSDFIS S1P5

Date:

Subject Name: Introduction to Forensic Science and Cyber Law

Time:

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

S. No.		Marks
Q.1	(a) Explain any five crime scene techniques with their tools utilized in Forensic Science. OR Write a note on significance of forensic science in criminal investigation.	05
	(b) Enumerate any five point of difference between Cognizable and Non-cognizable offences.	05
	(c) What do you understand by the term Cyber Crime; briefly explain some of the crimes done in cyberspace.	07
Q.2	(a) Briefly explain any five types of analysis done in Chemistry division of an FSL.	05
	(b) Briefly explain: i. Section 320, IPC ii. Section 293, CrPC iii. Section 291, CrPC iv. Section 137, IEA v. Section 375, IPC	05
	(c) Describe the main points of report writing in case of a sample received in FSL for digital evidence analysis. OR Write a brief note on the IT Act, 2000, highlighting its main objectives and aim.	07
Q.3	(a) Write a note on the following principles of Forensic Science. i. Principle of exchange ii. Law of probability iii. Law of progressive change iv. Principle of circumstantial facts	08

(d) Explain any 5 controls of IT Infrastructure with its risk, recommendation and example. 04

Q.3 (a) Write full form of the following: 04

- i) HIPAA
- ii) NIST
- iii) PCI-DSS
- iv) BCP

(b) What are the classification of Information? 04

(c) Discuss Disaster Recovery Planning and its various strategies. 08

OR

(c) What Must Your Organization Do to Be in Compliance? 08

(d) Describe the life cycle of BCP. 09

Q.4 (a) What is segregation of duties? 04

OR

(a) How to maximize C-I-A of LAN domain. 04

(b) Explain CAAT with various application control. 04

(c) If you are an auditor, then explain the process of cyber security audit carried out by you. 08

(d) Discuss the process of selecting and implementing effective controls in an organization. 09

OR

(d) Write a note on GDPR and its articles. 09

END OF PAPER

	(b)	Write briefly on: i- Section 304A IPC ii- Section 45A IEA iii- Section 293 CrPC iv- Section 67B IT ACT 2000
Q.4	(a)	Write a short note on INTERPOL and FBI.
	(b)	Highlight the main differences between Murder and Culpable homicide.
	(c)	Explain in detail the principles of Forensic Science.
Q.5	(a)	Explain in detail the components and types of a forensic science report.
	(b)	Elaborate Bailable offences and Non-Bailable offences with examples.
	(c)	Mention and thoroughly with examples the several divisions or branches of Forensic Sciences.
Q.6	(a)	Explain the mentioned below: i- CDTs ii- CCTNS iii- BPR&D iv- CBI
	(b)	The owner of the flat, which was rented out to a student, entered this flat as the main gate was unlocked. On entering the flat, he found two bodies, one male and another female, lying in a pool of blood. He immediately called the police and did not disturb the scene of occurrence. The investigation officer, on examination of the scene, found two sharp knives lying near the bodies. The suicide notes were recovered from the pockets of each body. Both the victims belonged to the same state and I.O. revealed that the girl had visited her friend. CCTV footage recording of a neighbor also confirmed her entry details in this flat. Answer the following: 1- What information can be furnished by the two sharp knives lying near the bodies? The investigation in this case should be carried out under which sections of IPC? Also, explain the sections. 2- Explain the recovery, preservation and examination of the CCTV footage found from the scene of occurrence

END OF PAPER

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Cyber Security - Semester - I - June-2023
Remedial Examination

Subject Code: CTMSCS-S1-PS**Date: 30/06/2023****Subject Name: Introduction to Forensic Science and Law****Time: 11:00AM to 02:00PM****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Mark
Q.1	(a)	What is Criminal Profiling?	05
	(b)	Write short note on: NCRB Or NIA	05
	(c)	Briefly mention the duties of a Forensic Scientist.	07
Q.2	(a)	What is Chain of Custody? Highlight the significance.	05
	(b)	Explain the collection and packaging technique to be followed for a ballistic evidence. Or Explain the organizational set up of Central Forensic Science Laboratory.	05
	(c)	Answer the following- <ol style="list-style-type: none"> 1- In which year the first GEQD was set up in India? 2- Name the first scientist to bring in the idea of anthropometry system for personal identification? 3- Section 47 of Indian Evidence Act is concerned with? 4- Mention any one intravenous hypnotic medications used for Narco-Analysis? 5- Which principle of forensic science was established by Mr. Edmond Locard? Explain. 	07
Q.3	(a)	Describe any 04 notices issued by the INTERPOL on international requests for cooperation and allowing in member countries to share critical crime-related information. Or What do understand by Cyber Crime? Explain Trojan, Malwares, Spam.	0

		<p>(b) Write briefly on:</p> <ul style="list-style-type: none"> i- Section 304A IPC ii- Section 45A IEA <p style="text-align: right;">Or</p> <ul style="list-style-type: none"> i- Section 293 CrPC ii- Section 67B IT ACT 2000
Q.4	(a)	Explain any two types of notices issued by the INTERPOL.
	(b)	Explain any 5 branches of forensic science.
	(c)	Explain in detail the principles of Forensic Science.
Q.5	(a)	Explain in detail the components of a forensic science report.
	(b)	Elaborate Bailable offences and Non-Bailable offences with examples.
	(c)	Explain in detail- <ul style="list-style-type: none"> i- Penetration testing ii- Firewall
Q.6	(a)	Explain the mentioned below: <ul style="list-style-type: none"> i- BPR&D ii- ED iii- CBI iv- NCRB
	(b)	What is CCTNS and what is the aim behind creation of such integrated system. How was it initiated and presently how does it help in the investigation of crime and detection of criminals? Explain.

END OF PAPER



Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Tech. Cyber Security - Semester - I - June-2023
(Remedial examination)

Subject Code: CTMTCS-S1-P5

Subject Name: Introduction to Forensic Science and Law

Date: 28/06/2023

Time: 11:00AM to 02:00PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Marks
Q.1	(a)	What do you mean by the Chain of Custody?	05
	(b)	Write short note on: Directorate of Forensic Science Services (DFSS) Or National Investigation Agency (NIA)	05
	(c)	Briefly mention the duties of a Forensic Scientist.	07
Q.2	(a)	What are packet sniffers?	05
	(b)	Explain the Hierarchical set up of Central Forensic Science Laboratory. Or Explain the Organizational set up of Central Forensic Science Laboratory.	05
	(c)	Answer the following- <ul style="list-style-type: none"> i- In which year the first GEDQ was set up in India? ii- Name the first scientist to bring in the idea of anthropometry system for personal identification? iii- Section 47 of Indian Evidence Act is concerned with? iv- Mention any one intravenous hypnotic medications used for Narco-Analysis? v- Which principle of forensic science was established by Mr. Edmond Locard? Explain. 	07
Q.3	(a)	Schematically explain the types of courts in India. What kind of criminal/civil cases are being taken up by these courts and been given the conviction? Or What do understand by Cyber Crime? What can be the possible preventive measures that can be followed in such type of crimes?	08

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Tech. Cyber Security

Semester - I

Subject Code: CTMTCS S1 P5

Date: 30/11/2023

Subject Name: Introduction to Forensic Science And Cyber Law

Time: 11:00 AM to 2:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

			Mark
Q.1	(a)	Discuss in brief the history of forensic science.	05
	(b)	Difference between bailable and non- bailable offences. OR Brief note on : CrPC, IPC, IEA	05
	(c)	Write the title of the following section : a) Sec 121A IPC b) Sec 302 c) Sec 324 IPC d) Sec 304A IPC	07
Q.2	(a)	Define: cognizable and non cognizable offences	05
	(b)	Describe various duties of forensic scientist.	05
	(c)	What are the different ways of data depiction? OR Illustrate the organizational structure of forensic science laboratory.	07
Q.3	(a)	Write about the basic principles of forensic science with examples.	08
	(b)	Discuss in detail about report writing.	08
Q.4	(a)	Brief note on : FIR OR Brief Note on : Cyber ethics	05
	(b)	Explain code of conduct of forensic scientists.	05
	(c)	Define forensic science and explain how is it related to other fields of science.	07
Q.5	(a)	Discuss about various police & detective training schools in India.	05

- (c) How to generate following output using python & other library from the given text "The quick brown fox jumps over the lazy dog." Explain output as well.

OUTPUT

07

[('The', 'DT'), ('quick', 'JJ'), ('brown', 'NN'), ('fox', 'NN'), ('jumps', 'VBZ'), ('over', 'IN'), ('the', 'DT'), ('lazy', 'JJ'), ('dog', 'NN'), ('.', '.')]

Q.5

Attempt any two.

- (a) How machine learning can be used to detect phishing attacks and identify fake content. 07
- (b) Explain the role of supervised learning algorithms in malware classification. 07
- (c) Explain how machine learning can be applied to pen testing, and discuss the benefits and limitations of this approach compared to traditional pen testing methods. 07

--- End of Paper---

Humidity	Sunny	Wind	Play
L	N	S	NO
H	N	W	YES
H	Y	S	YES
H	N	W	YES
L	Y	S	No

- (b) A medical team tests 800 individuals for a particular viral infection. Out of these:

500 people are actually infected with the virus (positive cases).

300 people are actually healthy (negative cases).

For the infected individuals:

The test correctly identifies the infection (true positive) in 400 cases.

The test wrongly identifies a healthy person as infected (false positive) in 100 cases.

For the healthy individuals:

The test correctly confirms they are healthy (true negative) in 250 cases.

The test wrongly identifies a healthy person as infected (false positive) in 50 cases.

1. Construct a confusion matrix for this data.

2. Calculate the accuracy, precision, recall, and F1 score for the test's performance in identifying infected individuals.

- (c) Explain working of K-means & Hierarchical clustering. Discuss about pros and cons of both unsupervised algorithm. 08

- (d) Explain KNN algorithm and finds the Euclidian distance between New customers named 'Monica' has height 161cm and weight 61kg and Old customer name 'Rama' has height 158cm and weight 58kg. 08

Q.3

Attempt any three.

- (a) Discuss the SVM algorithm working in detail. 08

- (b) Define perceptron neural network. Calculate the output y of three input neurons with a bias. The input feature vector is $(x_1, x_2, x_3) = (0.8, 0.4, 0.3)$ and weight values are $[w_1, w_2, w_3, b] = [0.2, 0.1, -0.3, 0.35]$. Use binary Sigmoid function as activation function. 08

- (c) Draw and describe ANN Architecture and CNN Architecture and how it's differentiate each other with an example of python code. 08

- (d) What is RNN? Define vanishing gradient descent problem. Why it happens in RNN. How it can be overcomes? 08

Q.4

Attempt any two.

- (a) Explain difference between object detection, object localization, object recognition, object segmentation. Write steps to detect face from given image using machine learning classifier. 07

- (b) Explain following Text-preprocessing with appropriate example. 07
1. Tokenization
 2. Stemming
 3. Lemmatization

	(b)	Write a short note on: (i) CCNTS and (ii) NCRB.	05
	(c)	Write a short note on INTERPOL..	07
Q.6	(a)	Discuss in detail the tools and techniques used in forensic analysis.	08
	(b)	Describe your court appearance as a Forensic expert. OR Write a note on various cyber crimes.	08

END OF PAPER

Q. 4 Attempt any Two

(07x02 = 14)

- (a) Discuss various applications of Computer Vision.
- (b) Write a note on Natural Language Processing and explain the importance of sentiment analysis.
- (c) Explain Pattern Recognition and discuss its importance with suitable example.

Q. 5 Attempt any Two

(07x02 = 14)

- (a) Write a note on Machine Learning based cyber security and discuss its importance in handling emerging cyber threats.
- (b) Write a note on Anomaly Detection and discuss an ML / DL based approach to detect anomalies.
- (c) Write a case study to illustrate how ML based malware detection is more effective than the traditional approach.

(b) Identify and briefly explain any one supervised machine learning model.

OR

Consider the following training data for the Naive Bayes Classifier.

chills	runny nose	headache	fever	flu?
Y	N	Mild	Y	N
Y	Y	No	N	Y
Y	N	Strong	Y	Y
N	Y	Mild	Y	Y
N	N	No	N	N
N	Y	Strong	Y	Y
N	Y	Strong	N	N
Y	Y	Mild	Y	Y

Which class is the candidate is classified in (Flu yes/ Flu No)? Show step by step execution.

Chills	Runny nose	Headache	Fever	flu
Y	N	Mild	Y	?

Q.4 (a) What is perceptron? Discuss Perceptron Learning Algorithm

06

(b) Write a short note on Face Detection methods and list any two applications of face detection.

06

(c) Explain in general the end-to-end steps in Natural Language Processing.

OR

Discuss the classification of Machine Learning systems

08

Q.5 (a) Discuss different types of Clustering. How do we measure similarity/proximity in cluster analysis? Discuss with the help of an example.

06

(b) Discuss Difference between following:

06

1) Prediction vs. Classification

2) Binary and multi-class classification

(c) Write a short note on the following:

08

i) Feed Forward (ii) Backpropagation algorithm

OR

Mention and explain different Performance Metrics of the Supervised Learning?

END OF PAPER

NATIONAL FORENSIC SCIENCES UNIVERSITY

MSc. (Cyber Security) - Semester -I (ATKT)- November- 2023

Subject Code: CTMSCS SI P4**Date: 22/11/2023****Subject Name: Artificial Intelligence****Time: 11.00 AM TO 2.00 PM****Total Marks: 100****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

	Marks
Q.1 (a) Explain the following terms : 1) NumPy 2) List 3) Dictionary 4) Pandas and 5) Matrices	06

OR

Discuss the machine Learning process with the help of Training, Testing and Validation Dataset.

(b) Consider following table for Data Pre Processing. List out all existing Data Quality Issues and give One solution for each issue.	06
--	-----------

Driver License	Age in Years	Occupation	Monthly Salary (INR)
123	24	driver	10000
512	234	teacher	8000
345	34	lawyer	20000
41	10	assistant	12000
623	54	doctor	9500
542	42	barber	12

(c) List out and discuss different static as well as dynamic features, which can be used for malware analysis using Machine Learning	08
---	-----------

Q.2 (a) Discuss difference between following:	06
(i) Dependent vs Independent variable	
(ii) Labelled vs Unlabeled Data	
(b) Clearly bring out the difference between ML and DL based on different criteria.	06
(c) Use K-means clustering algorithm to divide the following data points {2,3,4,10,11,12,20,25,30} into TWO clusters. Consider initial cluster centres as $c1=4$, $c2=12$.	08

OR

What is Anomaly? Explain Anomaly Detection using ML?

Q.3 (a) Define object tracking. List out and discuss types of object tracking. Explain object tracking algorithm with an example	10
---	-----------

OR

Explain RNN with its limitations. How LSTM can overcome the limitations of RNN. Explain with an example?

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. Digital Forensic & Information Security
Semester - II - November-2023

Subject Code: CTMSDFIS SII P4
Subject Name: Artificial Intelligence
Time: 11:00am-2:00pm
Total Marks: 100

Date: 04/12/2023

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q.1	(a)	What do you mean by loss function? Explain with an example squared loss function	Marks 10																										
	(b)	Classify different types of learning techniques. Explain any classification models with example	10																										
Q.2	(a)	Discuss in detail with a suitable example ANN. Also, mention the techniques used to fine-tune the model parameter.	10																										
	(b)	Use the method of least squares to find an equation for the prediction of a student's End semester exam grade based on the student's midterm grade in AI course shown in the Table below. Also, predict the final exam grade of a student who received an 86 on the midterm exam.	10																										
		<table border="1"><thead><tr><th>End Semester Grade</th><th>84</th><th>63</th><th>77</th><th>78</th><th>90</th><th>75</th><th>49</th><th>79</th><th>77</th><th>52</th><th>74</th><th>90</th></tr><tr><th>Mid Semester Grade</th><td>72</td><td>50</td><td>81</td><td>74</td><td>94</td><td>86</td><td>59</td><td>83</td><td>65</td><td>33</td><td>88</td><td>81</td></tr></thead></table>	End Semester Grade	84	63	77	78	90	75	49	79	77	52	74	90	Mid Semester Grade	72	50	81	74	94	86	59	83	65	33	88	81	
End Semester Grade	84	63	77	78	90	75	49	79	77	52	74	90																	
Mid Semester Grade	72	50	81	74	94	86	59	83	65	33	88	81																	
Q.3	(a)	Discuss with example nearest neighbour classification technique	10																										
	(b)	Explain with suitable example, how face detection work in real-time applications.	10																										
Q.4	(a)	Write a short note on the following: Object detection (ii) Backpropagation algorithm	10																										
	(b)	Define activation function and explain its importance. Explain any 3 activation functions in detail.	10																										
Q.5	(a)	Define text vectorization. Name all methods used for text vectorization and discuss anyone in detail.	10																										
	(b)	Discuss the Architecture and States of Long Short-Term Memory Network (LSTM)	10																										

Seat No.: _____

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Tech Cyber Security
Semester - I - January - 2024

Subject Code: CTMTCS23 SI P1

Subject Name: Artificial Intelligence

Time: 11:00 AM to 2:00 PM

Date: 17/01/2024

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Q. 1 Attempt any Three

(08x03 = 24)

- (a) Write any two python scripts to illustrate the way loops and conditions are implemented in python.
- (b) Explain arange, ones, shape and reshape functions of numpy library.
- (c) Explain matrix multiplication with suitable example and write a python script for multiplying two random matrices: A(3x4) and B(4x2).
- (d) Write python scripts to illustrate histogram and scatter charts / plots of Matplotlib.

Q. 2 Attempt any Three

(08x03 = 24)

- (a) Define Machine Learning and differentiate AI, ML and DL with suitable example(s).
- (b) Write a note on Feature Engineering and explain how it impacts the performance of any model.
- (c) Discuss various methods for measuring performance of any model.
- (d) Differentiate Supervised and Unsupervised learning and explain unsupervised learning with a suitable example.

Q. 3 Attempt any Three

(08x03 = 24)

- (a) Define a Neuron and explain the Artificial Neural Network along with back-propagation method.
- (b) Write a python script to illustrate Multi-layer Perceptron classifier.
- (c) Write a detailed note on Convolutional Neural Network.
- (d) Explain LSTM with suitable example.

NATIONAL FORENSIC SCIENCES UNIVERSITY

M.Sc. Cyber Security – ATKT - Semester - I - Nov-2023

Subject Code: CTMSCS S1 P2**Date: 23-11-2023****Subject Name: Cyber Security Audit and Compliance****Total Marks: 100****Time: 11:00 AM to 02:00 PM****Instructions:**

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

Marks

Q.1	(a) What are the controls, list its various types?	04
	(b) List the various types of Audit.	04
	(c) Discuss the HR Security control with all its sub controls according to ISO 27001/2, in detail.	08
	OR	08
Q.2	(c) What an organization must do to be in compliance.	09
	(d) Explain the check list to audit the data-center's physical and environmental security control.	09
	OR	04
	(a) State section 66 along with its subsections of Indian IT Act.	04
Q.3	(b) Give full form of 1) HIPAA, 2) SOC, 3) ISO, 4) BCP	08
	(c) Write a detailed note on COBIT framework.	09
	(d) You need to protect your organization from cyber-attack(s) which security controls you will implement in your organization for the protection? Explain them with justification.	09
	OR	09
Q.4	(d) Write a detailed note on HIPAA.	04
	OR	04
	(a) What is/are included in LAN Domain compliance?	04
	(a) Discuss the importance of security control.	04
Q.5	(b) Explain the difference between audit and assessment.	08
	(c) Illustrate the importance of having security audit in the organization.	09
	(d) Write a detailed note on Risk Management.	09
	OR	04
Q.6	(a) What is Computer Assisted Audit Techniques (CAAT)? Explain it in brief.	04
	(b) What is IT security assessment?	04
	OR	04
	(b) Explain the vulnerability management.	08
Q.7	(c) You are working as CISO of ABC organization. Recently your organization could not provide the services to the client because of heavy rain and flood like situation at Data-Center. Your board of directors have informed you to select a plan which can provide <u>24*7*365 continuous services</u> to the clients. Which plan you will select and explain that in detail.	09
	(d) Write the process for selecting proper security control for the organization in detail.	09

NATIONAL FORENSIC SCIENCES UNIVERSITY
M.Sc. Digital Forensics and Information Security – ATKT - Semester - I - Nov-2023

Subject Code: CTMSDFIS SI P2

Date: 23-11-2023

Subject Name: Cyber Security Audit and Compliance

Time: 11:00 AM to 02:00 PM

Total Marks: 100

Instructions:

1. Write down each question on separate page.
2. Attempt all questions.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.

		Marks
Q.1	(a) What are the controls, list its various types? (b) List the various types of Audit. (c) Discuss the HR Security control with all its sub controls according to ISO 27001/2, in detail.	04 04 08
	OR	08
	(c) What an organization must do to be in compliance. (d) Explain the check list to audit the data-center's physical and environmental security control.	09
Q.2	(a) State section 66 along with its subsections of Indian IT Act. (b) Give full form of 1) HIPAA, 2) SOC, 3) ISO, 4) BCP. (c) Write a detailed note on COBIT framework. (d) You need to protect your organization from cyber-attack(s) which security controls you will implement in your organization for the protection? Explain them with justification.	04 04 08 09
	OR	09
	(d) Write a detailed note on HIPAA.	04
Q.3	(a) What is/are included in LAN Domain compliance? (a) Discuss the importance of security control. (b) Explain the difference between audit and assessment. (c) Illustrate the importance of having security audit in the organization. (d) Write a detailed note on Risk Management.	04 04 08 09
Q.4	(a) What is Computer Assisted Audit Techniques (CAAT)? Explain it in brief. (b) What is IT security assessment? (b) Explain the vulnerability management. (c) You are working as CISO of ABC organization. Recently your organization could not provide the services to the client because of heavy rain and flood like situation at Data-Center. Your board of directors have informed you to select a plan which can provide <u>24*7*365 continuous services</u> to the clients. Which plan you will select and explain that in detail. (d) Write the process for selecting proper security control for the organization in detail.	04 04 04 08 09
