JGI **ARKA JAIN University** Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY			[30-04-2026] **END SEM EXAMINATION** School of Engineering & IT
Program	**Computer Science & Engineering**	**Branch**	**B. Tech**
Subject Name	**Compiler Design**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s).**		
Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	Define compiler and list its phases.	02	CO1	K1
ii	What is a token? Give examples.	02	CO1	K2
iii	Define Context-Free Grammar (CFG).	02	CO2	K1
iv	What is shift-reduce parsing?	02	CO2	K2
v	What is Syntax-Directed Definition (SDD)?	02	CO3	K1
vi	What is three-address code?	02	CO3	K2
vii	What is a basic block?	02	CO4	K1
viii	What is register allocation?	02	CO4	K1
ix	Define constant propagation.	02	CO5	K2
x	What is data-flow analysis?	02	CO5	K2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL
2	Explain the phases of a compiler with a neat diagram.	05	CO1	K2
3	Convert the given regular expression (ab)*abb into an NFA	05	CO2	K4
4	Explain top-down parsing with an example.	05	CO3	K2
5	Construct an LR parsing table for a simple grammar.	05	CO4	K3
6	Generate three-address code for the expression: a = b + c * d	05	CO5	K3
7	Explain basic block formation and flow graph with an example.	05	CO3	K2

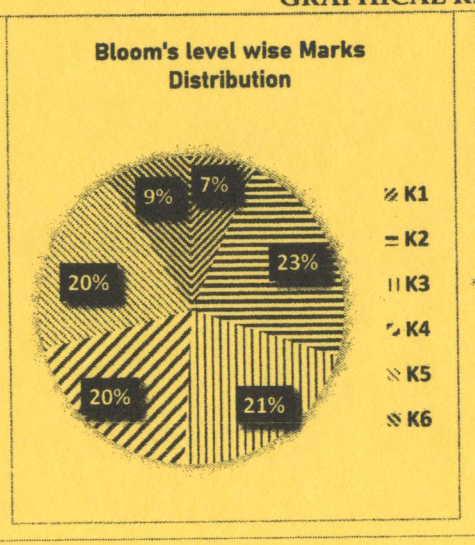
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

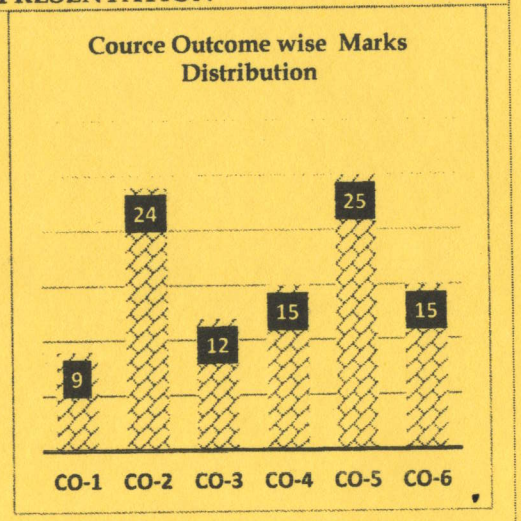
Q. No.	QUESTIONS	Marks	COs	KL
8	Design a lexical analyzer for identifiers, numbers, and keywords using DFA.	10	CO1	K4
9	Construct CLR parser for the grammar S→L=R, S→R, L→*R, R→L	10	CO2	K3
10	Explain syntax-directed translation and generate intermediate code for control statements (if-else / while).	10	CO3	K4
11	Explain code generation process and perform register allocation for a given expression Cont. a=(b+c) * (d-e)+f	10	CO4	K4
12	Explain data-flow analysis and apply constant propagation on a given code segment. Cont. a=5, b=a+3, c=b*2, a=10, d=a+c	10	CO5	K5

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Demonstrate the ability to design a compiler given a set of language features.
	CO2	Understand patterns, tokens & regular expressions for lexical analysis
	CO3	Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
	CO4	Design and implement LL and LR parsers.
	CO5	Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
	CO6	Design algorithms to generate machine code.

GRAPHICAL REPRESENTATION





JGI ARKA JAIN University Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY			[04-05-2026] END SEM EXAMINATION School of Engineering & IT
Program	**Computer Science & Engineering**	**Branch**	**B. Tech**
Subject Name	**Computer Networks**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will come under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.		
Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	What is IP? Explain subnet mask.	02	CO1	K1
ii	What is the significance of www in internet?	02	CO4	K2
iii	Explain Multiplexing. Describe all multiplexing techniques with a neat diagram	02	CO4	K2
iv	Differentiate static routing and dynamic routing	02	CO5	K4
v	What are transmission media in computer network? Name the transmission media used in computer networks.	02	CO3	K2
vi	Name some services provided by the application layer in the Internet model	02	CO3	K3
vii	Define LAN and MAN with examples.	02	CO2	K2
viii	Name the factors that affect the performance of the network?	02	CO2	K1
ix	What is the difference between switch and hub?	02	CO1	K1
x	Define Simplex, Half Duplex and Full-Duplex	02	CO2	K4

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	What is the difference between ipv4 and ipv6?	05	CO2	K1
3	What is CSMA/CD? Describe how it works?	05	CO2	K4
4	What is HTTP? Describe different types of HTTP?	05	CO4	K2
5	Differentiate between Physical Address and Logical Address	05	CO3	K6
6	What is the difference between TCP and UDP?	05	CO2	K2
7	Define SMTP? Describe how it works?	05	CO3	K4

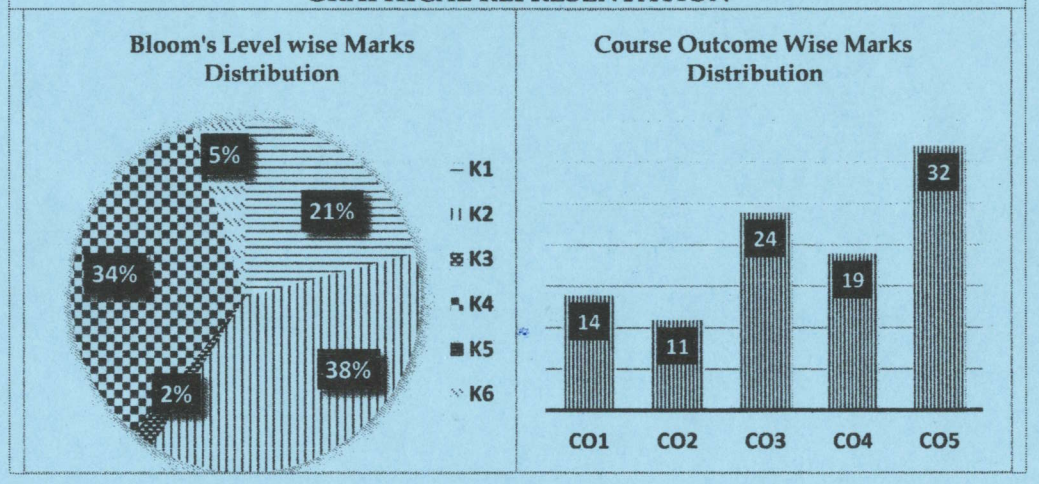
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Define multiplexing? Describe different types of multiplexing briefly?	10	CO4	K4
9	Explain the different topologies of the network	10	CO5	K1
10	What do you mean by Transmission media? Describe different types of transmission media with advantages and disadvantages of each?	10	CO4	K2
11	What are the general principles of congestion control? Explain	10	CO1	K2
12	Explain about ALOHA and CDMA	10	CO3	K4

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Explain the functions of the different layer of the OSI Protocol.
	CO2	Draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) describe the function of each block.
	CO3	Design it based on the market available component, for a given requirement (small scale) of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
	CO4	Develop the network programming, for a given problem related TCP/IP protocol.
	CO5	Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

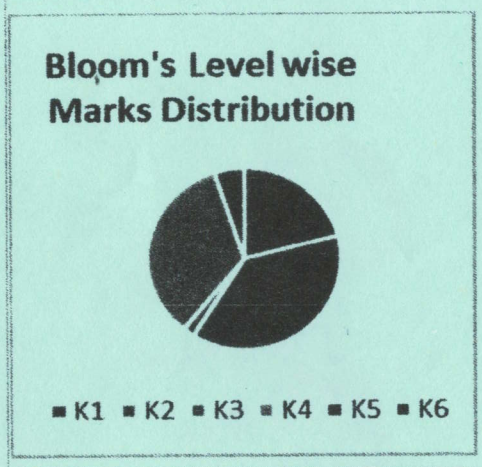
GRAPHICAL REPRESENTATION

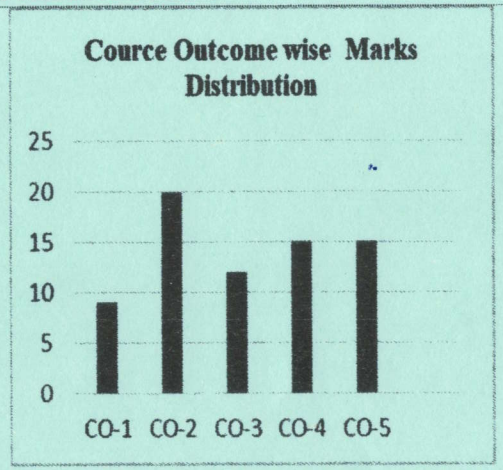


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Familiarize and compare the concepts of POP and OOP
	CO2	Test and execute the programs and correct syntax and logical errors.
	CO3	Understanding various components of networking that can be programmed
	CO4	Decompose a problem into functions and synthesize a complete program and their implementations using JDBC
	CO5	Develop reusable component for Graphical User Interface applications

GRAPHICAL REPRESENTATION





JGI **ARKA JAIN University** Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [06-05-2026] END SEM EXAMINATION School of Engineering & IT

Program	**Computer Science & Engineering**	**Branch**	**B. Tech**
Subject Name	**Advance Java Programming**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **Answer all Questions of Section A (Compulsory)**
- **Answer Any Four out of Six of Section B**
- **Answer Any Three out of Five of Section C**
- **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s).**

Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	Write an Applet code to show moving text.	02	CO1	K1
ii	What is the Abstract Window Toolkit (AWT) in Java?	02	CO2	K2
iii	Write an Applet code to show moving text.	02	CO2	K4
iv	List the main components of the JDK and their functions.	02	CO3	K1
v	How can you read form parameters sent via an HTTP request in a servlet?	02	CO4	K5
vi	What are the common security risks in servlet-based web applications?	02	CO2	K2
vii	What are reserved sockets in networking? Give examples of well-known ports that are reserved for common services	02	CO2	K3
viii	What is the purpose of the InetAddress class in Java?	02	CO5	K2
ix	What are the key security concerns when designing client-server applications in Java?	02	CO5	K6
x	Compare and contrast TCP and UDP.	02	CO5	K4

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Write a Java program that creates a window using AWT, displaying a button that changes the background colour when clicked	05	CO1	K3
3	In Hibernate, what are primary keys and foreign keys? How do you define a primary key for an entity class using annotations or XML configuration?	05	CO2	K2
4	What are reserved sockets in networking? Give examples of well-known ports that are reserved for common services.	05	CO3	K1
5	Write a servlet that handles both GET and POST HTTP methods. How would you differentiate between the two requests in your code?	05	CO3	K4
6	How would you use the Graphics class to change the paint mode in AWT? Provide a sample code to demonstrate this.	05	CO4	K2
7	Compare the use of Flow Layout and Grid Layout in AWT. In what situations would each be more appropriate?	05	CO5	K4

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	How can you map inheritance in Hibernate using annotations? Provide an example of using @Inheritance, Discriminator Column, and Discriminator Value for a class hierarchy.	10	CO4	K4
9	Evaluate the usability of JTree and JTable in displaying hierarchical and tabular data. Which one would you choose in a project that involves managing a complex dataset, and why?	10	CO2	K5
10	Create a program that opens a window and uses event listeners to handle multiple events such as button clicks, checkbox selections, and text input. Also Demonstrate how to use Graphics to draw a simple shape, like a rectangle, within a window.	10	CO3	K6
11	Create a Swing application that uses JTabbedPane to organize different sections of a user profile (e.g., personal details, contact info, preferences). Each tab should contain relevant form fields and buttons.	10	CO5	K6
12	Describe the different stages in the life cycle of a servlet. What happens in each stage?	10	CO3	K4

JGI ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[08-05-2026] END SEM EXAMINATION School of Engineering & IT	
Branch	**Computer Science & Engineering**	**Program**	**B. Tech**
Subject Name	**Data Science**	**Session**	**Even 2025-2026**
Semester	**VI**	**Year**	**April 2026**
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.		
Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	What do you mean by data science?	02	CO1	K1
ii	List any four tools used in data science.	02	CO1	K1
iii	What is a variable in Python? Give one example.	02	CO2	K1
iv	What is Exploratory Data Analysis (EDA)?	02	CO3	K1
v	Define CRISP-DM.	02	CO1	K2
vi	Explain ensemble learning.	02	CO5	K2
vii	Define median and mode.	02	CO3	K2
viii	What is K-Nearest Neighbours (KNN)?	02	CO4	K1
ix	Explain the purpose and working of the group by () function in Pandas.	02	CO5	K2
x	What do you mean by data visualization?	02	CO3	K2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain roles and responsibilities of data scientist.	05	CO1	K2
3	Explain different data types in Python with examples.	05	CO2	K2
4	Explain the role of descriptive statistics in Exploratory Data Analysis.	05	CO3	K2
5	Explain the common techniques used for data preprocessing.	05	CO3	K4
6	Describe regression and classification with examples.	05	CO5	K4
7	Explain Under fitting and Over fitting in ML.	05	CO4	K4

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

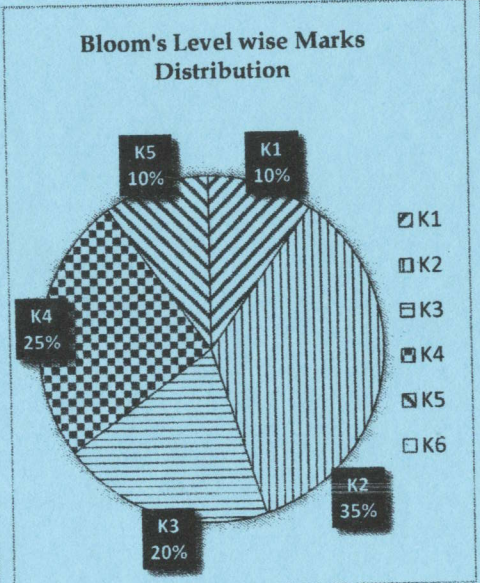
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain Data Science in detail and discuss its applications in various domains such as healthcare, finance, education, and business.	10	CO1	K2
9	Explain Python programming fundamentals and discuss the use of Pandas and NumPy libraries in Data Science	10	CO2	K3
10	Calculate the mean and standard deviation for the following table giving the age distribution of 542 members of a club.	10	CO5	K4
11	Explain advanced machine learning techniques such as PCA, t-SNE, Random Forest, Bagging, Boosting, and Deep Learning models (ANN, CNN, RNN).	10	CO5	K5
12	Explain the process of creating and querying relational databases using SQL with suitable examples.	10	CO2	K3

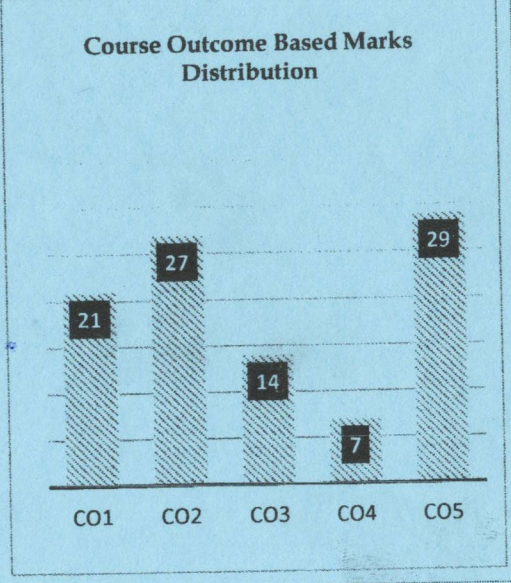
Age (in years)	Number of member
20-30	3
30-40	61
40-50	132
50-60	153
60-70	140
70-80	51
80-90	2

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Fundamental principles and methodologies in data science.
	CO2	Understand the core concepts of databases, and learn about Python Libraries.
	CO3	Acquire skills for data collection, cleaning, analysis, interpretation and gain proficiency in visualizing data to extract meaningful insights.
	CO4	Understand various machine learning algorithms and their applications.
	CO5	Apply data science techniques to solve practical problems and make data-driven decisions.

GRAPHICAL REPRESENTATION





JGI ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[11-05-2026] END SEM EXAMINATION School of Engineering & IT	
Program	**Computer Science & Engineering**	**Branch**	**B. Tech**
Subject Name	**Cyber Law and Ethics**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.		
Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	What do you mean by multi-factor authentication (MFA)?	02	CO1	K1
ii	List different types of Cyber Attack.	02	CO4	K1
iii	Outline the different types of security controls?	02	CO2	K2
iv	How do attackers exploit system vulnerabilities?	02	CO3	K3
v	Explain Cyber Security and what do you mean by CIA triad?	02	CO2	K2
vi	Define Firewall and its types.	02	CO3	K4
vii	Write the Common Vulnerabilities and Exposures (CVE) database.	02	CO2	K3
viii	What are the benefits of a zero-trust security model?	02	CO3	K4
ix	What are the benefits of a zero-trust security model?	02	CO2	K1
x	Write the JSON Web Token (JWT), and how is it used for authentication?	02	CO3	K2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Define how do firewalls and Intrusion Detection/Prevention Systems (IDS/IPS) help protect servers?	05	CO2	K2
3	Evaluate the effectiveness of IT act in controlling cyber security.	05	CO3	K5
4	Explain the penalties and expenses under the IT act.	05	CO2	K2
5	Explain Cyber forensic tools used in investigation.	05	CO4	K4
6	Identify security risks in case of corporate data breach.	05	CO2	K3
7	Explain the amendment made to IT act 2000.	05	CO4	K4

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Prepare a cyber security policy draft for an organisation.	10	CO4	K6
9	Compare intrusion detection and prevention systems (IDS/IPS)? How can security awareness training help reduce cyber threats?	10	CO2	K5
10	Discuss the silent features of IT Act 2000.	10	CO4	K1
11	Apply IT act provision to a case of data theft. Identify legal remedies available for cyber Stalking.	10	CO3	K3
12	Write the best practices for securing RESTful web services. How does poor network security lead to vulnerabilities?	10	CO2	K2

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Conduct a cyber-security risk assessment
	CO2	Measure the performance and troubleshoot cyber security systems
	CO3	Implement cyber security solutions.
	CO4	Use cyber security, information assurance, and cyber/computer forensics software/tools.

GRAPHICAL REPRESENTATION

