MCA/SEM-III/Choice Base/Two Year Course

(3 Hours) [Total Marks : 80]

N.B. :1) Question No.1 is **compulsory.**
2) Attempt any **three** from the remaining **five** questions.

Write a short note on following (any Four)

1. (a) 5 V's of Big Data **(5)**
(b) HDFS **(5)**
(c) No SQL **(5)**
(d) Hive **(5)**
(e) Pig **(5)**
(f) Apache Kafka **(5)**

2. (a) Explain Hadoop Ecosystem with core components. Explain its architecture ? **(10)**
(b) What are the different frameworks that run under YARN? Discuss the various YARN Daemons. **(10)**

3. (a) What is NoSQL? Explain various NoSQL Data architecture patterns? **(10)**
(b) What is RDD? How is data partitioned in RDD ? **(10)**

4. (a) (i) What are the advantages of Apache Spark over Map Reduce ? **(10)**
(ii) D3 and big data
(b) Explain Bulk Synchronous Processing (BSP) and graph processing wrt to Apache spark ? **(10)**

5 (a) What is significance of Apache Pig in Hadoop Context? Explain the main components and the working of Apache Pig with the help of diagram ? **(10)**
(b) What is Big Data and its types? List out the difference between Traditional Data Vs. Big Data with the help of example ? **(10)**

6 (a) Discuss the Apache Kafka fundamentals. Explain the Kafka Cluster Architecture with suitable diagram **(10)**
(b) Write short note on any one: **(10)**

a. Master slave vs peer to peer Architecture in No SQL
b. Partitioner and Combiner wrt to Map Reduce

Paper / Subject Code: 70722 / Distributed System & Cloud Computing

MCA/SEM-III/Choice Base/Two Year Course

(3 Hours) **[Total Marks: 80]**

N.B.: 1) Question No.1 is compulsory.
2) Attempt any three from the remaining five questions.

Q.1	**(a)**	What are the load-sharing policies used for distributed systems?	**5**
	(b)	What are election algorithms? Explain bully algorithm.	**5**
	(c)	What are the issues in data security in cloud computing?	**5**
	(d)	What is a grid computing mechanism	**5**
Q.2	**(a)**	Discuss the issues in designing and implementing DSM systems.	**10**
	(b)	What is process management? Explain the address transfer mechanism in detail.	**10**
Q.3	**(a)**	What is physical and logical clock synchronization; explain the drifting of a clock.	**10**
	(b)	What is group communication? Explain in detail Message ordering techniques (Absolute, consistent and casual ordering)	**10**
Q.4	**(a)**	Explain cloud computing and discuss cloud security issues.	**10**
	(b)	How file management is performed in a distributed environment? Explain with an example.	**10**
Q.5	**(a)**	What is multi-datagram messaging? Explain the failure handling technique in IPC	**10**
	(b)	Explain cloud computing architecture in detail.	**10**
Q.6		**Write a short note on:** a. Pipeline Thread Model b. Strict Consistency Model c. Drifting of the clock d. Callback RPC	**20**

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Time: 3 Hours **Marks: 80**

N.B.: (1) Question number 1 is **compulsory**.
(2) Attempt any **three** out of the remaining five.
(3) Figures to the right indicate full marks.

Q1.	A	Explain the concept of Hash chain.	**(05)**
	B	What is double spending? How it is overcome in Bitcoin	**(05)**
	C	Explain types of Block chain	**(05)**
	D	What is Sybil attack? How is it prevented in Bitcoin?	**(05)**
Q2.	A	State the difference between Bitcoin block chain and Ethereum block chain	**(10)**
	B	Explain Proof of Elapsed Time with suitable example.	**(10)**
Q3.	A	What are the objectives of consensus mechanisms	**(10)**
	B	What are various types of account in Ethereum?	**(10)**
Q4.	A	Explain Paxos algorithm in detail	**(10)**
	B	Explain Solidity in detail.	**(10)**
Q5.	A	Explain RAFT algorithm in detail	**(10)**
	B	Explain Byzantine Fault Tolerance in detail.	**(10)**
Q6		Write short notes on **(Any Four)**	**(20)**
	1	Hyper ledger Fabric	
	2	Smart Contracts	
	3	Proof of Work	
	4	Proof of Stake	
	5	Uses of Block chain.	

Paper / Subject Code: 70724 / Elective III : Deep Learning

MCA/SEM-III/Choice Base/Two Year Course

(3 Hours) **Total Marks: 80**

N.B. : 1) Question No.1 is **compulsory.**

2) Attempt any **THREE** from the remaining questions.

3) Figures to the right indicate full marks.

Q.1		Write a short note on any **Four**	**20**
	A	McCulloch-Pits Neuron	**5**
	B	Dataset Augmentation	**5**
	C	Recursive Neural Networks.	**5**
	D	Long Short-Term Memory (LSTM) network.	**5**
	E	The relation between ML and DL.	**5**
Q.2	**A**	Describe Ensemble Learning methods for Deep Neural Networks.	**10**
	B	Explain any one Regularization Technique in detail.	**10**
Q.3	**A**	Explain Multi-Layered Perceptron (MLP) with a neat diagram	**10**
	B	Briefly explain any two benefits of using CNNs over traditional fully connected Feed-Forward NNs for learning visual tasks.	**10**
Q.4	**A**	Explain Multi-task Learning and describe some of its applications.	**10**
	B	Explain the Gradient-Descent based Back-Propagation Learning algorithm.	**10**
Q.5	**A**	Explain the encoder-decoder RNN architecture for machine translation.	**10**
	B	Explain the basic algorithms for and challenges in neural network optimization.	**10**
Q.6	**A**	Briefly explain the concepts of overfitting and inductive bias.	**10**
	B	Explain the architecture of a Convolutional Neural Network with a neat diagram.	**10**

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Time: 3 Hours **Max. Marks: 80**

Note:

1. **Question 1 is compulsory. All questions in Q1 must be solved.**
2. **Solve any three from Q2 to Q6.**
3. **Draw diagrams wherever necessary.**
4. **All questions carry equal marks.**

Q1. Write short notes on: **(20)**

A. Email Spoofing and Phishing.
B. ID theft.
C. Computer sabotage.
D. Cyber defamation.

Solve any Three from Q2 to Q6

Q2. **(20)**

A. What is Cyber crime against society? Explain in detail. **10**

B. Explain network scanning and its types in detail. **10**

Q3 **(20)**

A. What is footprinting? Explain types of footprinting & purpose of footprinting in detail. **10**

B. What is Banner grabbing? Explain types of techniques available to perform Banner grabbing. **10**

Q4 **(20)**

A. What is SQL Injection? Explain SQL Injection attack & prevention. **10**

B. What is steganography? Explain types of steganography. **10**

Q5 **(20)**

A. What is Social Engineering? Explain types of Social Engineering. **10**

B.. What is BOT's & BOTNET's Explain in detail. **10**

Q.6. **(20)**

A. Explain DNS Poisoning & ARP Poisoning in detail. **10**

B. What is Proxy Server? Explain types of Proxy server in detail. **10**

Paper / Subject Code: 70727 / Elective III : Quantum Computing

MCA/SEM-II / Choice Base / Two Year Course

Time: 3 hours **Max. Marks: 80**

Instructions:

i. Question 1 is compulsory.
ii. Solve any three from the remaining questions Q2 to Q6.
iii. Provide illustrations wherever required.

Q1.

A What are the various Quantum state transformations? (10)

B Write a note on circle notation for Multi-Qubit Registers. (10)

Q2.

A Explain Quantum Arithmetic briefly. (10)

B Discuss Quantum Gates. (10)

Q3.

A What is the benefit of QPU in the field of Computer Graphics? (10)

B Explain the Quantum Circuit Model of Computation. (10)

Q4.

A Compare Quantum Supersampling (QSS) with Conventional Supersampling? (10)

B How is linear Algebra performed in Quantum Computing? (10)

Q5.

A How does Quantum computing differ from Traditional Computing? (10)

B Discuss the various Single Qubit Gates. (10)

Q6.

A What is Quantum Teleportation? Discuss the pros and cons of Quantum teleportation. (10)

B Give a write-up on general Quantum Operations. (10)

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Z154

MCA/SEM-III/Choice Base/Two Year Course

(Time : 3 Hours) **[Total Marks : 80]**

N.B. (1) Question No. **1** is **Compulsory.**
(2) Attempt any **three** questions from the remaining **five** questions.
(3) Answers to **sub-questions** should be **grouped** and written **together.**

Q.1	A	Explain in brief protection for plants in IPR	[5]
	B	What cannot be registered as a Trademark?	[5]
	C	What is Geographical Indication? What is the importance of GI tag?	[5]
	D	What are Software Copyrights and Software Patents?	[5]
Q.2	A	What is Trademark? Explain the types of trademarks and state why the types of trademarks are important.	[10]
	B	How is the IPR enforced? Which agencies help actively to do so?	[10]
Q.3	A	What are Patents? Explain the procedure for its filing.	[10]
	B	How is the trademark on any goods and services implemented in different countries? Also give an overview of trademark of domain names.	[10]
Q.4	A	Explain in detail copyrights for digital age.	[10]
	B	What is trade secret? What are the characteristics of it? Explain the types of trade secrets with suitable example	[10]
Q.5	A	What is Industrial Design? What is infringement of Industrial Designs and remedies for it?	[10]
	B	Explain Copyright infringement and its remedies & penalties.	[10]
Q.6	A	What is IP ownership? What are the issues and challenges in IPR in India?	[10]
	B	Explain in detail Patent infringement & its remedies.	[10]

Paper / Subject Code: 70729 / Elective IV : Green Computing

MCA / SEM-III / Choice Base / Two Year Course

(Time: 3 Hours) Total Marks: 80

N.B. (1) Question No. 1 is compulsory.
(2) Attempt any three of the remaining five questions.
(3) Figures to the right indicate full marks.

1 **Write short notes on:** [20]

a) What do you mean by Global warming, greenhouse gases? Explain
b) Write a short note on the smart grid.
c) What is the difference between RoHS and WEEE?
d) Explain the life cycle of the device or hardware.

2 (a) Communication and social media play an important role in managing Green IT and justify the statement. [10]

(b) What are the major categories of information systems within an organization? Provide examples of greening enterprise activities at each level. [10]

3 (a) Which are the programming methods used to achieve computational efficiency? [10]

(b) How to calculate the Cooling Needs of any organization? Explain in detail. [10]

4 (a) What are the different stages in the electronic device? Explain the impact of every stage on the environment. [10]

(b) What is meant by green IT? Explain a holistic approach to green IT. [10]

5 (a) Discuss the drivers for businesses to implement the green IT strategy. Illustrate with relevant real-world examples. [10]

(b) What are the various e-waste disposal techniques, and which is the most effective among them and why? [10]

6 (a) Describe in detail the green building standards and green data centers. [10]

(b) Distinguish between the direct effects of green IT and the enabling effects of green IT–based applications. [10]

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Paper / Subject Code: 70730 / Elective IV : Management Information System

MCA/SEM-III /Choice Base / Two Year Course

(3 Hours) **Total Marks: - 80**

N.B. (1) Question No. **1** is **compulsory.**
(2) Attempt any **three** from the remaining questions.
(3) Illustrate answers with neat sketches wherever required.
(4) Answers to questions should be **grouped** and written **together.**

Q.1	(a)	What is called MIS? Define its importance?	05
	(b)	What is the purpose of DSS in MIS?	05
	(c)	What is the IT infrastructure?	05
	(d)	Explain the types of Decision support system?	05
Q.2	(a)	How are information systems and information technology different?	10
	(b)	Explain the types of communications in organizations.	10
Q. 3	(a)	What is the main difference between data and information? Give some examples.	10
	(b)	Explain Knowledge based expert system (KBES) and its components.	10
Q. 4	(a)	Why is BI developed? Explain the process of converting Data into BI.	10
	(b)	What is information security management? Explain.	10
Q. 5	(a)	Explain the Tools and Techniques of BI	10
	(b)	What are the measures of information security.	10
Q. 6	(a)	Why is vendor management important? What are the key issues to consider for managing vendors carefully?	10
	(b)	Define what is the IT Infrastructure for an organization?	10

Paper / Subject Code: 70731 / Elective IV : Cyber Security & Digital Forensics

MCA/SEM-II/Choice Base/Two Year Course

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No.1 is compulsory

(2) Attempt any THREE Questions between Question No.2 to 6

Q1. **Answer ANY FOUR out of FIVE questions.** **(20)**

a) Indian ITA- 2000.

b) Industrial Espionage

c) Credit Card Frauds.

d) Key loggers and Spywares

e) Challenges in Computer Forensics

Q2.

A. Discuss in detail the classification of cybercrime. **(20)**

B. What is the different between virus and worms? Discuss the different types of viruses

Q3.

A. What is the need for digital forensic? Illustrate Digital Forensic process with diagram. **(20)**

B. Define SQL injection? What are the steps for SQL Injection?

Q4.

A. Explain the difference between passive and active attacks with examples **(20)**

B. Explain the relevance of the OSI 7 Layer Model to Computer Forensics?

Q5.

A. Discuss human based and computer based social engineering. **(20)**

B. What is digital evidence? Discuss the challenges in handling Duplication and Preservation of Digital Evidence.

Q6.

A. What is Android Data Extraction? Explain Android Data Extraction Techniques. **(20)**

B. What is an intrusion detection system? Give its advantages and disadvantages.

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Paper / Subject Code: 70732 / Elective IV : Entrepreneurship Management

MCA/SEM-III /Choice Base / Two Year Course

Total Marks: 80

(3 Hours)

N.B. : 1) Question No.1 is **compulsory.**
2) Attempt any **THREE** from the remaining questions.
3) Figures to the right indicate full marks.

Q1. (a) What is the difference between Entrepreneurship and Intrapreneurship? Explain the classification & types of Entrepreneurs. [10]
(b) Explain the strengths and weakness of Small Industries Business. [10]

Q2. (a) Briefly explain about writing a business plan and why some business plan fails? [10]
(b) Describe Small-scale Industries with Undertakings, SSI Policy Statement, Procedure for SSI Registration. [10]

Q3. (a) Explain the role of Entrepreneurship Development Institute of India (EDII) & National Institute of Entrepreneurship & Small Business Development (NIESBUD). [10]
(b) Write a brief note on Marketing Strategies. [10]

Q4. (a) Explain the terms Leadership and HRM in detail. [10]
(b) Define Social Responsibility. Explain Corporate Social Responsibility with suitable example. [10]

Q5. (a) Briefly explain about Marketing Mix & Breakeven Analysis [10]
(b) What is Negotiation & Delegation. Explain the different action taken in Leadership for the growth and development of the Venture? [10]

Q6. Short Note (Solve Any Four) [20]
a) Risk Management
b) Digital Marketing
c) Strengths and Weakness of Small Business
d) Dimensions of CSR
e) Small Industries Service Institute (SISI)
