

(Time: 3 Hours)

Total Marks: 80

N.B. :

- 1) Question No.1 is **compulsory**.
- 2) Attempt any **three** from the remaining **five** questions.
- 3) Figures to the right indicate full marks

1. (a) Explain the process of call set up and mobile number portability in GSM. What are the various roaming scenarios in GSM? (10)  
(b) Explain the Mobile IP configuration and describe how data transfer from mobile node to fixed node and vice versa with short description about i) Foreign agent ii) Home agent iii) Care of Address iv) Mobile Node. (10)
  2. (a) Explain in detail Spread Spectrum Technique and its uses. What is Direct Sequence Spread Spectrum Technique? (10)  
(b) Explain the Indirect TCP and Snooping TCP with their advantages and disadvantages. (10)
  3. (a) Discuss the WAP protocol architecture in detail. Explain its bearer services. (10)  
(b) Explain the various operational steps in Cellular System for call establishment between mobile users. Differentiate Soft Handoff and Hard Handoff. (10)
  4. (a) Discuss various impairments in wireless communication. Define Fading and its types in detail. (10)  
(b) What is WiMAX? Explain IEEE 802.16 protocol architecture and its services in detail. (10)
  5. (a) Explain the architecture and components of GPRS. (10)  
(b) Explain the concept behind Dynamic Host Configuration Protocol. How Dynamic Source Routing (DSR) different from Destination Sequenced Distance Vector (DSDV) in MANET. (10)
  6. (a) Write short notes any **two** of the following (10)
    - (i) LTE
    - (ii) W-CDMA
    - (iii) WML and WML Script.  
(b) Explain Bluetooth protocol architecture with diagram and its devices various transition states. (10)
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## Sem - V - choice based.

(3 Hours)

[Total Marks: 80]

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

(2) Attempt any three out of remaining five questions.

- Q.1 (a) Discuss the issues involved in designing a Distributed Operating System. 10  
 (b) What is Cloud Computing? What are the service models of Cloud Computing? 10  
 Explain in brief.
- Q.2 (a) Explain concept of logical clock & their importance in distributed system. A clock 10  
 should never run backwards. How can this be implemented? How is this issue handled  
 in implementation of logical clocks?  
 (b) What do you mean by Idempotency? How can you implement exactly once semantics 10  
 in message passing system?
- Q.3 (a) What are threads? What advantage they have over processes? Compare 10  
 implementation of threads package at user level and kernel level.  
 (b) What is light weight RPC? Explain in detail. 10
- Q.4 (a) Differentiate between stateful & stateless servers. Which servers are better for fault 10  
 recovery and why?  
 (b) What are election algorithms? Explain bully algorithm in detail with diagram. Is it 10  
 more efficient than ring algorithm?
- Q.5 (a) What is sequential consistency? How is data locating mechanism handled in replicated 10  
 migrating blocks and non-replicated migrating blocks?  
 (b) What is parallel computing? Explain with example task and data parallelism. 10
- Q.6 Write short notes on - 20  
 (a) CORBA  
 (b) SOA  
 (c) Grid computing  
 (d) Identity and access management

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## Sem-IV - choice based

Time : 3 hrs

Total Marks : 80 marks

**Note : Question No. 1 is compulsory.**Attempt any **three** from the remaining **six** questions.

All questions carry equal marks.

- Q1 a) Explain in details emotional impact of user experience. (10 marks)  
b) Explain the Formative and summative UX evaluation model with its data analysis technique. (10 Marks)
- Q2. A) Draw User Experience lifecycle diagram and explain in details each module. (10 Marks)  
b) Explain Mapping between Designers and User Mental Model. (10 Marks)
- Q3. A) Discuss various Ux Design paradigms. (10 Marks)  
B) Explain various bridged contextual inquiry process. (10 Marks)
- Q4. A) Enlist all User Experience needs in business and its usability impact in business model. (10 Marks)  
B) Differentiate between user persona and sketching. (10 Marks)
- Q5. A) Explain the process of extracting requirements systematically from conceptual data. (10 marks)  
B) Explain some Ux design data collection technique and its impact on result evaluation. (10 marks)
- Q6. A) What are the factors essential for User experience agile SE method and its advantages and disadvantages. (10 marks)  
B) Write short note on i) User Classes ii) UXD evaluation report. (10 Marks)

## Sem-V - choice based.

Time : 3 Hours

Total Marks: 80

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

2) Attempt any **three** from the remaining **five** questions.

3) Figures to the right indicate full marks

- Q1. Explain in brief
- (a) BASE properties of NoSQL databases. 5
  - (b) 3 Vs of Big data. 5
  - (c) HDFS Federation 5
  - (d) Hive SerDe 5
- Q2. (a) Illustrate the main components of HDFS with the diagram. 10
- (b) Compare HBASE with conventional RDBMS. 10
- Q3. (a) Explain the Hadoop ecosystem with the diagram. Elaborate any three components of Hadoop Ecosystem? 10
- (b) What to you mean by InputFormat ? What is the role of RecordReader in Hadoop MapReduce? 10
- Q4. (a) List the types of NoSQL databases with an example of each. 10
- (b) What is HIVE? Explain HIVE architecture in detail. 10
- Q5. (a) How Relational Algebra operations are executed using MapReduce ? 10
- (b) What is Pig ? Discuss the Load() & Store() commands in Pig framework. 10
- Q6. Write short notes on **any four** of the followings 20
- (a) HBASE data models
  - (b) Speculative Execution
  - (c) YARN
  - (d) HDFS Commands
  - (e) Pig Latin

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## Sem-IV - choice based.

[3 hours]

[Marks: 80]

- Question No. 1 is compulsory
- Attempt **any three** from the remaining six questions
- Assumptions should be made whenever required and should be clearly stated
- Answers to sub questions should be answered together
- Illustrate answers with diagrams wherever necessary
- Use of Calculators is permitted

- Q1 A Explain the K Means clustering and write the algorithm . Find TWO clusters of the following data set taking subject 1 and 4 as the initial clusters 10

Subject	A	B
1	1.0	1.0
2	1.5	2.0
3	3.0	4.0
4	5.0	7.0
5	3.5	5.0
6	4.5	5.0
7	3.5	4.5

- B What are ensemble algorithms? Explain the Adaboost as a boosting ensemble method and its working 10

- Q2 A Explain with a suitable example the Principal Component Analysis used for Dimension reduction 10

- B What is an anomaly? Analyze the various methods of Anomaly detection 10

- Q3 A Predict the target value( FLU) using Naive Bayes Theorem for the case (Y,Y,Mild,Y) 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

- B Define Support Vector Machines and explain the process of getting the maximum margin linear separator 10

- Q4 A Fit a Linear Regression Model to best predict statistics performance, based on math aptitude scores 10

Student	Math Aptitude Score	Statistics
1	95	85
2	85	95
3	80	70
4	70	65
5	60	70

- B Explain the Bayesian belief networks with a suitable example 10

- Q5 A Draw the decision tree for the following set of data where the target variable is Purchased 10

City	Job	Credit Limit	Age	Purchased?
Bangalore	Employed	1-2 L	20	Yes
Chennai	Student	1L	15	Yes
Chennai	Employed	2-3 L	55	No
Chennai	unemployed	1L	33	No
Bangalore	Employed	1L	27	Yes
Bangalore	Student	1L	18	No
Chennai	Employed	2-3 L	28	Yes

- B Explain the following terms 10

- Bias
- Error
- Accuracy
- Variance
- Dimensions

- Q6 A Write Short Notes on **any four** of the following 20
- Recommender systems
  - EM Learning
  - CART
  - Hierarchical Clustering
  - Hypothesis Testing

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## Sem - V - choice based.

Time : 3 Hours

Marks: 80

N.B. :

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

- Q.1 (a) Explain IoT value chain 10
- (b) Explain IoT in terms of Smart Cities 10
- Q.2 (a) What are different IoT enabling technologies? Explain Wireless Sensor Network (WSN) in detail 10
- (b) Explain one open source prototyping platform for IoT 10
- Q.3 (a) Explain Architecture Reference Model for IoT. 10
- (b) Explain Service Oriented Architecture (SOA) for IoT 10
- Q.4 (a) Explain technical design constraints involved in Devices and Networks in terms of Functional Requirements, Sensing and communications field 10
- (b) What is M2M? Explain key application areas of M2M. 10
- Q.5 (a) Explain IoT in terms of Retail 10
- (b) Explain in detail functional model in IoT reference model 10
- Q.6 Write short notes on (any four) 20
- (a) Difference between IoT and M2M
  - (b) ETSI M2M/ one M2M state of art architecture
  - (c) Cloud Computing
  - (d) Motion Sensor
  - (e) Constraints in IoT data representation and visualization

V (Choice Base)

(3 Hours)

[Total Marks : 80]

- N.B. :**
- 1) Question No.1 is **compulsory**.
  - 2) Attempt **any three** from the remaining five questions.
  - 3) Answers to questions should be grouped together

- Q1. (a) Explain the basic components of a Multimedia System. Discuss issues related to their compatibility. [10]
- (b) Discuss the relevance of Prototype development in designing multimedia systems. [10]
- Q2. (a) Explain the IMA architecture framework used in designing multimedia applications. [10]
- (b) Explain various analog and digital display standards. [10]
- Q3. (a) Discuss in detail various Video file formats. [10]
- (b) What are RAID's? Explain in detail all RAID levels with suitable diagrams. [10]
- Q4. (a) Discuss various Print output technologies prevalent today. [10]
- (b) Explain any two image compression techniques in detail. [10]
- Q5. (a) Explain the process of determining the cost of a multimedia project. Explain with a suitable example. [10]
- (b) Discuss various Audio file formats and standards. [10]
- Q6. Write short notes on following topics (**any four**) [20]
- a) WROM
  - b) Full Motion Video
  - c) Huffman Coding
  - d) Idea analysis
  - e) Scanners
  - f) Touch Screens



Sem-IV - choice based.

Duration: 3 hours

[Total Marks :80]

- N.B (1) Question No.1 is compulsory.  
 (2) Answer any **Three** questions from Question Nos. 2 to 6.  
 (3) Figures to the right indicate full marks.

- Q1 **Write a note on any 4:** [20]  
 A) Role of IPR in the world of E-Commerce  
 B) Ownership of IPR.  
 C) Geographical Indication  
 D) Discuss some important patents acquired by India.  
 E) Piracy and its impact on society.
- Q2A What do you mean by patents? What can and cannot be patented? Explain in brief the process to get a patent. [10]  
 Q2B Write a note on the Intellectual Property Rights with respect to Industrial designs and Integrated Circuits layout design. [10]
- Q3A Discuss in detail implementation of IPR in India. [10]  
 Q3B How is the IPR enforced? Which agencies help actively to do so? [10]
- Q4A How is the trademark on any goods and services implemented in other countries? Also give an overview of trademark of domain names. [10]  
 Q4B What is a copyright? Explain its types in detail. [10]
- Q5A What are trademarks? Explain the types of trademarks in brief. [10]  
 Q5B What are the copyrights uses and misuses? Explain the exceptions to copyright infringements. [10]
- Q6A Explain in detail the issues that occur in the IPR. [10]  
 Q6B What do you mean by the term 'Confidential Information'? Also explain what can and what cannot be protected by confidentiality [10]



## Choice Base

## NOTE:

- I. Question No. 1 is Compulsory
- II. Attempt any **THREE** question from 2 to 6
- III. **Group Question** must be **answered together**
- IV. Assume any **additional** information but **justify the same**

- 1 A Write short note on:  
i. Hypothesis    ii. Thesis    iii. Law    iv. Construct    v. Postulate    10
- B a. What do you mean by research? Explain its significance in modern times.    05  
b. Mention the criteria of good research.    05
- 2 A "Empirical research in India in particular creates so many problems for the researchers". State the problems that are usually faced by such researchers.    10
- B What is t-test? Explain its significance in statistical analysis.    10
- 3 A What is a literature review in a research study?    10
- B Find out two types of mean deviation for the following data-  
4, 7, 10, 11, 13, 5, 8, 12    10
- 4 A a. Doctors believe that the average teen sleeps on average no longer than 10 hours per day. A researcher believes that teens on average sleep longer. Write Null and alternative hypothesis for given situation and calculate level of significance?    05  
b. A company has stated that their straw machine makes straws that are 4 mm diameter. A worker believes the machine no longer makes straws of this size and samples 100 straws to perform a hypothesis test with 99% confidence. Write Null and alternative hypothesis for given situation and calculate level of significance?    05
- B Why interpretation is necessary? Discuss two major aspects of it.    10
- 5 A Mention various measures of central tendency with examples.    10
- B Discuss different steps followed in writing reports.    10
- 6 A Which are various points to be kept in mind related to ethics in our research?    10
- B Explain the research process with a flow chart.    10

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Sem-IV - choice based.

(3 Hours)

[Marks: 80]

**N.B. :**

- (1) Question No.1 is **compulsory**.
- (2) Attempt any **Three** Questions from the remaining **Five** questions.
- (3) Answers to questions should be **grouped** and written **together**.
- (4) Draw the diagrams whenever required.

1. (a) What is MIS? How MIS support the managers in Management process? (10)
- (b) Differentiate data and Information, Is Information a product? What are the quality parameters of Information? (10)
2. (a) What is rational decision making? What are different kinds of rationality? What are the problems in rational Decision making? (10)
- (b) What are the factors of success and failure of development of MIS? (10)
3. (a) What are the differences between strategic design and contemporary design of MIS? Explain with suitable diagram. (10)
- (b) What are the different kinds of Analytical models used for Decision analysis, Explain each in brief. (10)
4. (a) What is Knowledge Management System (KMS)? What are the driving force behind KM? Explain in brief. (10)
- (b) "Development of MIS is linked with the business plan of organization" Justify your answer. (10)
5. (a) In the process of development of MIS when would you use prototype approach and when would you use life cycle approach explain it? (10)
- (b) Why the systems are vulnerable? Explain spoofing, sniffing and Denial of Service attacks on system. (10)
6. Write Short Notes on any **Four** :- (20)
  - (a) Types of E-Commerce
  - (b) Differentiate among Goal , Objective and Target
  - (c) Classification of Information
  - (d) Function of MIS
  - (e) Human as an Information Processor



## Sem-V - choice based

(3 Hours)

[Total Marks : 80]

- N.B. :** 1) Question No.1 is **compulsory**.  
2) Attempt any **three** from the remaining **five** questions.  
3) Draw suitable diagrams wherever required

- Q.1 A List and Explain Business drivers of Green IT Strategy 10  
B What is green data centre? Explain Green data centre metrics. 10
- Q.2 A List and Explain Steps in developing a Green IT Strategy. 10  
B Explain in detail the life cycle of device or hardware. 10
- Q.3 A Explain Business dimensions for green IT Transformations 10  
B Explain energy Management Techniques for hard disks. 10
- Q.4 A Explain Green Data storage, Networks and Communications with suitable examples. 10  
B Explain the term Telepresence and Telecommuting. 10
- Q.5 A Explain the term Reuse, Recycle and Dispose in Green Computing 10  
B What are Energy-Saving software techniques? 10
- Q.6 20  
Write short notes on (**any four**)
- A Regulating Green IT  
B Three R's of Green IT  
C Green software  
D Power consumption issues.  
E Smart Grid