MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech.V Semester End Examinations
(Information Technology)
(Model Question Paper)

MR-22

Subject Title: Software Engineering **Subject Code: IT501PC**
Time: 3 hours Max. Marks: 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	Write the applications of software	1	1	1	1
1. b)	Outline two disadvantages of Waterfall model	1	2	1	1
	Unit-II				
1. c)	List the functional requirements of online-Examination system	1	1	2	1
1. d)	What is requirements validation?	1	1	2	1
	Unit-III				
1. e)	Define Design Quality	1	1	3	3
1. f)	What is Software Architecture	1	1	3	1
	Unit-IV				
1. g)	Define system testing	1	1	4	1
1. h)	Define Software Quality	1	1	4	8
	Unit-V				
1. i)	Identify different categories of risks	1	3	5	2
1. j)	What is software reliabilty	1	1	5	2

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Describe Management and Customer Myths	5	1	1	1
2. b)	Explain about Capability Maturity Model Integration	5	2	1	1
	OR				
2. c)	Explain about Spiral model with a neat diagram	5	2	1	1
2. d)	Explain about Agile Methodology	5	2	1	11
	Unit-II				
3. a)	Explain the Taxonomy of Non-functional requirements with a neat diagram	5	2	2	1
3. b)	Demonstrate software requirements document	5	2	2	1
	OR				
3. c)	Write short notes on Feasibility studies	5	1	2	1
3. d)	Explain about requirements management	5	2	2	1
	Unit-III				
4. a)	Write short notes on Design Concepts	5	1	3	1
4. b)	Describe about Architectural styles with a neat diagram	5	1	3	3
	OR				
4. c)	Construct Class diagram for Passport automation System	5	6	3	3
4. d)	Construct Sequence diagram for Book bank System	5	6	3	1
	Unit-IV				
5. a)	Explain about Black-box Testing techniques	5	2	4	1
5. b)	Explain about White box testing techniques	5	2	4	1
	OR				
5. c)	Compare and contrast Testing and Debugging	5	4	4	1
5. d)	Write short notes on Software measurement	5	1	4	1
	Unit-V				

P.T.O.

6. a)	Explain the methods for Risk Identification.	5	2	5	1
6. b)	Prepare the format of risk information sheet	5	3	5	1
OR					
6. c)	Write ISO 9000 quality Standards	5	1	5	8
6. d)	Write short notes on Formal Technical Reviews	5	1	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech.V Semester End Examinations
(Information Technology)
(Model Question Paper)

MR-22

Subject Title: Data Communications and Computer Networks **Subject Code: IT502PC**
Time: 3 hours Max. Marks: 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	List various types of Topologies.	1	1	1	1,2
1. b)	What are the key elements of any protocol?	1	2	1	1
	Unit-II				
1. c)	Name all the framing techniques	1	1	2	1
1. d)	Describe ALOHA.	1	3	2	1,2
	Unit-III				
1. e)	Define Tunnelling.	1	1	3	1
1. f)	What is meant by Internetwork routing?	1	1	3	1,2
	Unit-IV				
1. g)	Why three way handshake is used in TCP.	1	1	4	2
1. h)	List all QoS parameters of transport layer	1	1	4	1
	Unit-V				
1. i)	What is a hierarchical namespace in DNS?	1	3	5	1,2
1. j)	Define SNMP Protocol	1	1	5	1

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Discuss the features and principles of OSI reference model diagram.	5	2	1	1,2
2. b)	What is connection? Explain different types of connections.	5	2	1	1
	OR				
2. c)	Briefly explain about frame relay networks	5	2	1	1,3
2. d)	What is Switching? Explain various switching Mechanisms?	5	2	1	1,2
	Unit-II				
3. a)	Explain simple stop and wait protocol.	5	1	2	1
3. b)	With the neat sketches, formulate and explain the working principle of CRC with an example.	5	3	2	1,2,3
	OR				
3. c)	How performance is improved in CSMA/CD protocol compared to CSMA protocol? Explain.	5	4	2	1,3
3. d)	Write about the control frames of HLDC protocol	5	3	2	1
	Unit-III				
4. a)	Explain unicast routing protocol in detail.	5	2	3	1
4. b)	What is internetworking? Explain its types.	5	1	3	1,2
	OR				
4. c)	What is purpose of ICMP? Explain its messages in detail.	5	1	3	1,3
4. d)	With a neat diagram explain distance vector routing protocol	5	4	3	1,2
	Unit-IV				
5. a)	Write a comparative notes on TCP and UDP protocols	5	3	4	1,3
5. b)	Elucidate congestion Prevention Policies?	5	4	4	1,2
	OR				

P.T.O.

5. c)	What is congestion? Explain any two methods of handling it.	5	1	4	1,2,3
5. d)	Write short notes of different techniques that are employed to improve QoS.	5	3	4	1,2,3
Unit-V					
6. a)	Explain DNS in internet in detail.	5	1	5	1,2
6. b)	Distinguish between FTP and SMTP.	5	3	5	1
OR					
6. c)	What is an Electronic mail? Explain the two scenarios of architecture of E-Mail.	5	1	5	1,3
6. d)	Explain the operation of SNMP protocol in detail	5	2	5	1,3

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech. V Semester End Examinations
(Common to IT & CSM)
(Model Question Paper)

MR-22

Subject Title: Machine Learning **Subject Code:** CM502PC
Time: 3 hours Max. Marks : 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	What is the main goal of machine learning?	1	1	1	1,2,12
1. b)	What is Overfitting?	1	1	1	1,2,12
	Unit-II				
1. c)	What metric is commonly used to determine the best split in a decision tree?	1	2	2	1,2,3,12
1. d)	What is the main disadvantage of k-NN in terms of computational efficiency	1	1	2	1,2,3,12
	Unit-III				
1. e)	What problem does the Exclusive-OR (XOR) function present for a single-layer perceptron?	1	1	3	1,2
1. f)	What is the primary goal of the backpropagation algorithm	1	1	3	1,2,12
	Unit-IV				
1. g)	What is a Bayesian Belief Network?	1	2	4	1,2,3,12
1. h)	What is the objective of a Support Vector Machine?	1	1	4	1,2,3,12
	Unit-V				
1. i)	Differentiate between hierarchical and partitional clustering.	1	1	5	1,2,3,12
1. j)	What is a centroid in the context of the k-means algorithm?	1	2	5	1,2,3,12

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Explain the differences between supervised, unsupervised, and reinforcement learning with examples of each.	5	1	1	1,2,12
2. b)	Define the confusion matrix and explain its significance in evaluating classification models. Discuss the different metrics that can be derived from the confusion matrix.	5	2	11	1,2,12
	OR				
2. c)	Compare and contrast Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) in the context of dimensionality reduction.	5	2	1	1,2,12
2. d)	Explain the concept of cross-validation and its importance in evaluating machine learning models. Provide an example of how k-fold cross-validation is performed.	5	3	1	1,2,12
	Unit-II				
3. a)	Explain the process of constructing a decision tree using the basic decision tree learning algorithm. Discuss the role of Information Gain in this process.	5	3	2	1,2,3,12
3. b)	Discuss the differences between lazy learning and eager learning in the context of instance-based learning. Provide examples of each.	5	3	2	1,2,3,12

P.T.O.

<table>
<tr><td colspan="7">OR</td></tr>
<tr><td>3. c)</td><td>Find the Entropy and Information Gain for the given dataset.
<table>
<tr><th>Outlook</th><th>Temperature</th><th>Humidity</th><th>Wind</th><th>Play tennis</th></tr>
<tr><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr>
<tr><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr>
<tr><td>Overcast</td><td>Hot</td><td>High</td><td>Weak</td><td>Yes</td></tr>
<tr><td>Rain</td><td>Mild</td><td>High</td><td>Weak</td><td>Yes</td></tr>
<tr><td>Rain</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr>
<tr><td>Rain</td><td>Cool</td><td>Normal</td><td>Strong</td><td>No</td></tr>
<tr><td>overcast</td><td>Cool</td><td>Normal</td><td>Strong</td><td>Yes</td></tr>
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<tr><td>Rain</td><td>Mild</td><td>High</td><td>strong</td><td>No</td></tr>
</table></td><td>5</td><td>3</td><td>2</td><td>1,2,3,12</td></tr>
<tr><td>3. d)</td><td>Explain the k-nearest neighbors algorithm in detail, including how it works and its application in classification tasks.</td><td>5</td><td>4</td><td>2</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">Unit-III</td></tr>
<tr><td>4. a)</td><td>Explain the perceptron learning algorithm and how it adjusts weights during training. Illustrate with an example.</td><td>5</td><td>2</td><td>3</td><td>1,2,3,12</td></tr>
<tr><td>4. b)</td><td>Describe the process of initializing weights in neural networks. Why is proper weight initialization important, and what are some common strategies?</td><td>5</td><td>2</td><td>3</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">OR</td></tr>
<tr><td>4. c)</td><td>Provide an illustrative example of how a neural network, particularly an MLP, can be applied to face recognition. Describe the key steps involved.</td><td>5</td><td>4</td><td>3</td><td>1,2,3,12</td></tr>
<tr><td>4. d)</td><td>Compare and contrast the use of radial basis functions (RBF) and multi-layer perceptrons (MLP) in neural networks. When would you prefer one over the other?</td><td>5</td><td>2</td><td>3</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">Unit-IV</td></tr>
<tr><td>5. a)</td><td>Explain Bayes' Theorem and its significance in Bayesian learning. Provide an example to illustrate how it is applied in machine learning.</td><td>5</td><td>2</td><td>4</td><td>1,2,3,12</td></tr>
<tr><td>5. b)</td><td>Provide an example of how SVMs can be used in a real-world application, such as image classification. Explain the steps involved from data preprocessing to model evaluation</td><td>5</td><td>3</td><td>4</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">OR</td></tr>
<tr><td>5. c)</td><td>Discuss the Naïve Bayes classifier and its application in text classification. What are the key assumptions,</td><td>5</td><td>2</td><td>4</td><td>1,2,3,12</td></tr>
<tr><td>5. d)</td><td>Describe the SVM algorithm, including its training process and how it deals with both linearly separable and non-linearly separable data.</td><td>5</td><td>2</td><td>4</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">Unit-V</td></tr>
<tr><td>6. a)</td><td>Explain the k-means clustering algorithm. Provide a step-by-step example of how it works on a small dataset.</td><td>5</td><td>3</td><td>5</td><td>1,2,3,12</td></tr>
<tr><td>6. b)</td><td>Discuss the concepts of bagging and boosting in ensemble learning. How do these methods improve model performance?</td><td>5</td><td>3</td><td>5</td><td>1,2,3,12</td></tr>
<tr><td colspan="7">OR</td></tr>
<tr><td>6. c)</td><td>Compare and contrast hierarchical clustering with k-means clustering. What are the advantages and limitations of each method?</td><td>5</td><td>3</td><td>5</td><td>1,2,3,12</td></tr>
<tr><td>6. d)</td><td>Provide an example of how reinforcement learning can be applied to a real-world problem, such as robot navigation. Describe the key components involved.</td><td>5</td><td>2</td><td>5</td><td>1,2,3,12</td></tr>
</table>

M: Marks; L: Bloom’s Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)

MR-22

B.Tech.V Semester End Examinations

(Common to CSE & IT)

(Model Question Paper)

Subject Title: Principles of Programming Languages **Subject Code: CS512PE**

Time: 3 hours Max. Marks: 60

Note: Answer ALL Questions

Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	List out language categories.	1	1	1	3
1. b)	Define syntax and semantics.	1	1	1	2
	Unit-II				
1. c)	What is type checking?	1	1	2	1
1. d)	What is scope and life time of variable?	1	1	1	2
	Unit-III				
1. e)	What are the characteristics of subprograms?	1	2	1	1
1. f)	What is meant by encapsulation?	1	1	1	2
	Unit-IV				
1. g)	What is semaphore?	1	1	1	2
1. h)	What is meant by exception?	1	1	1	2
	Unit-V				
1. i)	What are the applications of Logic programming?	1	3	1	1
1. j)	What is data abstraction?	1	1	1	2

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Describe the steps involved in the language evaluation criteria.	5	5	1	2
2. b)	Describe the basic concept of axiomatic semantics.	5	2	2	1
	OR				
2. c)	Discuss various programming domains and their associated languages.	5	1	2	3
2. d)	Discuss about language recognizers and language generators.	5	1	2	3
	Unit-II				
3. a)	What is type checking? Differntiate between static and dynamic type checking and give their relative advantages.	5	1	1	2
3. b)	Explain about the control structures with an example.	5	3	1	1
	OR				
3. c)	What do you mean by binding? Give examples of some of the bindings and their binding times.	5	1	2	1
3. d)	Explain associative arrays, their structure and operations.	5	3	1	3
	Unit-III				
4. a)	Explain about the semantic models of parameter passing.	5	3	1	1
4. b)	Explain about generic sub-programs with examples.	5	3	2	2
	OR				
4. c)	Define sub program. What are the distinct categories of subprograms?	5	1	1	1
4. d)	How co-routines are different from conventional subprograms?	5	1	3	1
	Unit-IV				
5. a)	What are the various methods of exception handling? Discuss.	5	2	1	1
5. b)	What is monitors? Explain in detail.	5	2	1	2
	OR				
5. c)	Explain how to handle the exceptions in C++.	5	3	1	2
5. d)	Write a brief note on C# threads.	5	1	1	1
	Unit-V				
6. a)	Explain about the internal representation of two LISP lists.	5	3	1	2

P.T.O.

6. b)	Describe about the basic elements of prolog.	5	2	1	2
OR					
6. c)	Explain about the fundamentals of functional programming languages.	5	3	1	1
6. d)	Differentiate functional and imperative languages	5	4	2	3

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MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)

MR-22

B.Tech. V Semester End Examinations

(Common to CSE & IT)

(Model Question Paper)

Subject Title: Data Science **Subject Code: CS523PE**

Time: 3 hours Max. Marks : 60

Note: Answer ALL Questions

Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	Define BigData.	1	1	1	1
1. b)	What is Datafication?	1	1	1	1
	Unit-II				
1. c)	List out Statistical summary functions.	1	2	2	1
1. d)	What is Linear regression?	1	1	2	1
	Unit-III				
1. e)	Differentiate between Supervised and Unsupervised Learning.	1	2	3	1
1. f)	Mention applications of Naive Bayes Algorithm.	1	2	3	1
	Unit-IV				
1. g)	Define Data Wrangling.	1	1	4	1
1. h)	List out R packages for Web Scrapping.	1	2	4	1
	Unit-V				
1. i)	What is Data Security?	1	1	5	1
1. j)	Mention the features of Boxplot.	1	2	5	1

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Explain in detail about data types in R language.	5	2	1	1
2. b)	What is meant by modelling? Explain how to build a statistical model.	5	1,2	1	1
	OR				
2. c)	What is operator? Explain different types of operators in R Programming.	5	1	1	1
2. d)	Write about Model Fitting with an example.	5	4	1	2
	Unit-II				
3. a)	Briefly explain about the activities or lifecycle of Data science with neat diagram.	5	2	2	1
3. b)	Frame out the differences between KNN and K-Mean models?	5	4	2	2
	OR				
3. c)	What is EDA? Explain the basic visualization graphs.	5	2	2	1
3. d)	Illustrate the Linear Regression? Apply this technique for House price prediction	5	3,4	2	2
	Unit-III				
4. a)	In detail, Write about the demerits of Linear Regression and KNN algorithms.	5	2	3	1
4. b)	How does the Naive Bayes algorithm work in the context of spam filtering?	5	4	3	2
	OR				
4. c)	What is Motivation behind using Naive Bayes algorithm in Filtering Applications?	5	3	3	1
4. d)	Explain in detail about the Mathematical Working Principle of Naive Bayes algorithm.	5	2	3	2
	Unit-IV				

P.T.O.

5. a)	Explain the differences between filter, wrapper, and Embedded methods for feature selection.	5	2	4	1
5. b)	What is feature selection? Illustrate decision tree algorithm.	5	4	4	1
OR					
5. c)	What are the primary differences between Web Scraping and using APIs for data collection?	5	2	4	1
5. d)	What role does creativity play in feature generation? Why it is important in Data Science?	5	1	4	1
Unit-V					
6. a)	Define Data Visualization? Explain Basic Principles of Data Visualization?	5	1,2	5	1
6. b)	Describe a Case Study on iris Dataset using Visualization Techniques.	5	6	5	3
OR					
6. c)	Deduce the steps to create your own Visualization of a Complex Dataset.	5	6	5	3
6. d)	List out some key ethical considerations in Data Science, particularly in relation to Privacy and Security?	5	2	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome