

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC2OE16

CLOUD COMPUTING

Time: 3 hours

(IT, CSE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Discuss about business and IT perspective of Cloud Computing	2	1	7M
		ii) Explain the Essentials of Cloud Computing	2	1	7M
	OR				
	b	i) How to develop a Cloud Infrastructure. Explain	2	1	7M
		ii) Explain the limitations of Cloud Computing	2	1	7M
2	Unit-II				
	a	i) Explain the storage and network virtualization	2	1	8M
		ii) Explain the different types of hypervisors	2	1	6M
	OR				
	b	i) Explain the Cloud Computing architecture on the basis of load balancing	2	2	7M
		ii) Explain the similarities and differences between grid computing and cloud computing	2	2	7M
3	Unit-III				
	a	i) Compare and Contrast the public cloud and private cloud with example	3	2	7M
		ii) Compare and Contrast the Jericho cloud cube model and Linthicum model	3	2	7M
	OR				
	b	i) Explain the different types of cloud services	2	2	14M
	4	Unit-IV			
a		i) Explain the Cloud management products	2	3	7M
		ii) Explain the various types of web browsers	3	3	7M
OR					
b	i) Explain the disaster management in detail	3	3	14M	
5	Unit-V				
	a	i) Explain the components of MS Azure	3	4	7M
		ii) Discuss about the Applications of MS Azure	3	4	7M
	OR				
	b	i) Explain the Amazon Web Services Cloud Platform in the perspective of compute and networking	3	4	7M
		ii) Explain the Comparison between Azure and AWS	3	4	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks***

III B.Tech II Semester Regular Examinations, APRIL-2023

Sub Code: R20CC32MC1 ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

Time: 3 hours

(ME, CE, EEE, ECE)

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a Elucidate the position of women in Ancient, Medieval and Modern Women.	K2	1	14M
	OR			
	b Describe Characteristics of Indian culture, Significance of Indian Culture.	K2	1	14M
Unit-II				
2	a Briefly explain Epic of Ramayana.	K3	2	14M
	OR			
	b Write about the short history of the Sanskrit literature.	K3	2	14M
Unit-III				
3	a Explain the role of Modern theatre and Indian Cinema	K2	3	14M
	OR			
	b Write about the main elements of Hindu temples in Indian.	K2	3	14M
Unit-IV				
4	a How can you assess Indian Culture in South, East and Central Asia and Western World through ages?	K3	4	14M
	OR			
	b Explain briefly Causes, Significance and Modes of Indian culture Exchanges.	K3	4	14M
Unit-V				
5	a Elaborate the Aim of Indian education in Ancient, Medieval and Modern era.	K2	5	14M
	OR			
	b Describe Science and Scientist in Ancient and Modern India.	K2	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations - APRIL-2023

Sub Code: R20CC32MC2 PROFESSIONAL ETICS AND HUMAN VALUES

Time: 3 hours

(CSE.IT.AI)

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	Explain the importance of self confidence in ethics	K2	1	14M
	OR				
	b	Explain: A)Civic virtue B) Respect for others C)Cooperation	K2	1	14M
2	Unit-II				
	a	Distinguish the theory of Lawrence Kohlberg's with Carol Gilligan's	K2	2	14M
	OR				
	b	Discuss Engineers Role As Managers, Consultants And Leaders.	K2	2	14M
3	Unit-III				
	a	Describe the concept of Human Rights.	K2	3	14M
	OR				
	b	Explain the factors that influence Gender bias and Mayer Model.	K2	3	14M
4	Unit-IV				
	a	What is collective bargaining? Explain the process of collective bargaining	K2	4	14M
	OR				
	b	Describe the Occupational crimes and explain types of Whistle Blowing.	K2	4	14M
5	Unit-V				
	a	Describe the concept of Risk-Benefit Analysis with an example.	K2	5	14M
	OR				
	b	What are the Engineers responsibilities towards safety and risk?	K2	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC3201 CRYPTOGRAPHY AND NETWORK SECURITY

Time: 3 hours

(CSE, CSE (AI), IT)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a i) With a neat sketch, explain the model for network security and different components in it.	2	1	7M
	a ii) Consider an automated teller machine (ATM) in which users provide a personal identification number (PIN) and a card for account access. Give examples of confidentiality, integrity, and availability requirements associated with the system.	4	1	7M
	OR			
	b i) Discuss about different security services and their relation with security mechanisms.	2	1	7M
	b ii) Encrypt the text 'NARASARAOPETAENGINEERINGCOLLEGE' using rail fence cipher with 3 levels. Also explain the decryption process.	3	1	7M
Unit-II				
2	a i) With an example for each, write about different operations used in each full round of AES encryption.	2	2	7M
	a ii) Present and explain the design considerations of modern block ciphers.	5	2	7M
	OR			
	b i) With a neat sketch, explain DES Key Schedule.	2	2	7M
	b ii) Discuss the merits and demerits of different block cipher operational modes.	5	2	7M
Unit-III				
3	a i) With an example explain RSA key generation and encryption procedures.	2	3	7M
	a ii) If 2 is a primitive root of 29, construct a table of discrete logarithms, and use it to solve the congruence $x^7 \equiv 17 \pmod{29}$.	3	3	7M
	OR			
	b i) State and prove Euler's Totient theorem.	4	3	7M
	b ii) Illustrate the working of Diffie-Hellman key exchange.	2	3	7M
Unit-IV				
4	a i) Present and explain the requirements of cryptographic hash functions.	2	4	7M
	a ii) Explain signature generation and verification processes of DSS.	2	4	7M
	OR			
	b i) Illustrate birthday attacks on digital signatures.	5	4	7M
	b ii) Explain the procedure for HMAC calculation.	2	4	7M
Unit-V				
5	a i) Explain the working of Kerberos authentication service.	2	5	7M
	a ii) Explain the importance of dual signature in SET.	4	5	7M
	OR			
	b i) Explain different fields in X.509 certificates.	2	5	7M
	b ii) Explain the phases in SSL handshake protocol.	2	5	7M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC3204

MACHINE LEARNING

Time: 3 hours

(CSE, IT)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	i) If your model performs great on the training data but generalizes poorly to new instances, what is happening? Can you name three possible solutions?	2	1	7M
	a ii) The complexity of most learning algorithms is a function of the training set. Can you suggest and explain a filtering algorithm that finds redundant instances?	3	1	7M
	OR			
	b i) One source of noise is error in the labels. Can you suggest and explain a method to find data points that are highly likely to be mislabeled?	2	1	7M
	ii) Propose a three-level cascade where when one level rejects, the next one is used. How can we fix the λ on different levels?	4	1	7M
Unit-II				
2	i) What is the likelihood ratio? Write the log likelihood for a multinomial sample of your choice.	1	2	7M
	a ii) For a two-class problem, describe normal samples for two classes with different variances, and then use parametric classification to estimate the discriminant points.	3	2	7M
	OR			
	b i) When the training set is small, the contribution of variance to error may be more than that of bias and in such a case; we may prefer a simple model even though we know that it is too simple for the task. Can you give an example?	3	2	7M
	ii) Describe the procedures that can be used for fine-tune the model complexity.	2	2	7M
Unit-III				
3	i) Explain the reasons why reducing dimensionality is a separate preprocessing step.	2	3	7M
	a ii) In factor analysis, how can we find the remaining ones if we already know some of the factors?	1	3	7M
	OR			
	b i) What are the THREE measures that are frequently calculated in learning association rules? Explain.	1	3	7M
	ii) Describe the TWO steps in Apriori Algorithm.	2	3	7M

Unit-IV					
4	a	i) How can we do hierarchical clustering with binary input vectors—for example, for text clustering using the bag of words representation?	2	4	7M
		ii) We can do k-means clustering, partition the instances, and then calculate S_i separately in each group. Why is this not a good idea? Explain your answer.	3	4	7M
	OR				
	b	i) How can we make k-means robust to outliers? Explain.	2	4	7M
ii) In hierarchical clustering, how can we have locally adaptive distances? What are the advantages and disadvantages of this? Explain.		3	4	7M	
Unit-V					
5	a	i) In regression trees, how can we get rid of discontinuities at the leaf boundaries? Explain with example.	2	5	7M
		ii) In generating a univariate tree, a discrete attribute with n possible values can be represented by n 0/1 dummy variables and then treated as n separate numeric attributes. What are the advantages and disadvantages of this approach?	3	5	7M
	OR				
	b	i) Illustrate Decision Tree versus random Forest.	2	5	7M
ii) Explain the working principle of random forest algorithm		3	5	7M	

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC3205

ADVANCED JAVA AND WEB TECHNOLOGIES

Time: 3 hours

CSE, CSE(AI)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Describe various phases of Servlet Life Cycle.	1	1	7M
		ii) Discuss the use of session tracking and cookies.	2	1	7M
	OR				
	b	i) Briefly explain the functionality of Tomcat web server.	2	1	7M
ii) Explain the step by step process of HTTP Servlet request and response with an example.		2	1	7M	
Unit-II					
2	a	i) Describe the template text, action elements and usage of implicit JSP objects.	1	3	7M
		ii) Distinguish between Servlets and JSP.	4	2	7M
	OR				
	b	i) Write an example program for displaying values using an Expression to Set an Attribute.	3	2	7M
ii) Briefly explain the JSP application design process with Model View Controller.		2	2	7M	
Unit-III					
3	a	i) Write brief note on the Error handling and debugging process in JSP.	1	2	7M
		ii) What are the different ways of sharing data between JSP pages? Explain.	3	3	7M
	OR				
	b	i) What are memory usage considerations in JSP? Discuss the importance of keeping track on memory usage.	1,6	3	7M
ii) What is Control passing? Explain different control passing techniques between JSP pages.		1,2	3	7M	
Unit-IV					
4	a	i) Explain JDBC architecture.	2	4	7M
		ii) Discuss the use of JDBC in developing an interactive web page.	2	4	7M
	OR				
	b	i) Explain the process of retrieving data from Java Server Page using prepared statement result.	2	4	7M
ii) What is JDBC and how does it work? Explain.		1,2	4	7M	
Unit-V					
5	a	i) Illustrate the working of PHP arrays with an example program.	3	5	7M
		ii) Explain recursive variables and call back functions with example program.	2,5	6	7M
	OR				
	b	i) What is database programming? Give an example using MySQL.	1,3	5	7M
ii) Write an example PHP script to validate the User registration screen. (Assume any 5 fields of your choice for new user registration)		3	6	7M	

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC3206

BIG DATA ANALYTICS

Time: 3 hours

(CSE, IT)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Discuss in brief about various building blocks of Hadoop.	2	1	7M
		ii) Briefly explain the step by step the procedure to configure Hadoop Cluster in local mode.	2	1	7M
	OR				
	b	i) Explain the Google File System Architecture with a neat diagram.	2	2	7M
		ii) Write a short note on Hadoop Distributed File System(HDFS).	1	1	7M
2	Unit-II				
	a	i) What is Map Reduce. Explain its implementation process with an example.	1,3	2	7M
		ii) What is the purpose of Mapper and Reducer? Write a short note on a) Mapper Code and b) Reducer Code	1,2	2	7M
	OR				
	b	i) Discuss the difference between old and new Hadoop APIs for Map Reduce Framework.	4	1,2	7M
		ii) Write Map Reduce steps for counting number of occurrences of specific number in input file.	3	2	7M
3	Unit-III				
	a	i) Define RDD. Briefly explain the steps in creating RDDs.	1,2	3	7M
		ii) How the caching is relevant in Spark Streaming? Explain.	2	4	7M
	OR				
	b	i) Explain the working of SPARK with the help of its architecture.	2	4	7M
		ii) What are the different Data Formats supported by SPARK. Illustrate with suitable example.	1,3	4	7M
4	Unit-IV				
	a	i) How can you run Pig Latin scripts in Local and Distributed Modes? Briefly explain.	2	5	7M
		ii) Draw and Explain the architecture of APACHE PIG in detail.	2	5	7M
	OR				
	b	i) Discuss about Pig Latin Application Flow.	2	5	7M
		ii) Write about the various categories of Operators supported by PIG.	1,2	5	7M
5	Unit-V				
	a	i) Explain in detail about the data types and schemes in HIVE	2	5	7M
		ii) Highlight the role of indexes in improving HIVE queries with suitable illustration.	5,6	5	7M
	OR				
	b	i) Explain any three HIVEQL DDL commands with their syntax and examples.	2,3	5	7M
		ii) Explain the process of creating and managing Databases and Tables in HIVE.	1,2	5	7M

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CCMN40

FUNDAMENTALS OF MACHINE LEARNING

Time: 3 hours

(ME)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) What is machine learning, and what are some of its key components	K2	CO1	7M
		ii) Can you give an example of a learning problem with a small VC Dimension and one with a large VC Dimension?	K4	CO1	7M
	OR				
	b	i) How does the sample size affect the success of a PAC Learning algorithm?	K3	CO1	7M
		ii) Explain the difference between supervised and unsupervised learning. Provide examples of each.	K2	CO1	7M
2	Unit-II				
	a	i) What is Bayesian Decision Theory and how is it different from frequentist approaches to decision making?	K2	CO2	7M
		ii) How can one evaluate the performance of a classification model?	K1	CO2	7M
	OR				
	b	i) What is the relationship between discriminant functions and feature selection in machine learning?	K3	CO2	7M
		ii) What is the difference between support and confidence in association rule mining? Illustrate with example.	K2	CO2	7M
3	Unit-III				
	a	i) What are some common techniques for dimensionality reduction	K1	CO3	7M
		ii) How can one use LDA to reduce dimensionality in a classification problem	K4	CO3	7M
	OR				
	b	i) What are some common applications of PCA in industry?	K4	CO3	7M
		ii) What is the Apriori algorithm and how does it work	K3	CO3	7M
4	Unit-IV				
	a	i) What is the Expectation Maximization algorithm and how does it work?	K2	CO4	7M
		ii) What are some advantages of the SOM algorithm over other clustering algorithms?	K2	CO4	7M
	OR				
	b	i) How can one use the k-Means Clustering algorithm to cluster data? Illustrate with example	K3	CO4	7M
		ii) What is fuzzy clustering and how is it different from traditional clustering methods?	K2	CO4	7M

Unit-V					
5	a	i) What is a decision tree and how does it work?	K3	CO5	7M
		ii) What are some common advantages of using a random forest over a decision tree?	K3	CO5	7M
	OR				
	b	i) What are some common techniques used to prune decision trees	K2	CO5	7M
ii) How can one evaluate the performance of a random forest algorithm?		K4	CO5	7M	

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CCMN34

SOFTWARE ENGINEERING

Time: 3 hours

(ECE,EEE)

Max. Marks: 70

Note: Answer All FIVE Questions. All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) What is software Life cycle model? Explain.	K4	CO1	7M
		ii) Write the differences between functional and non-functional requirements.	K4	CO1	7M
	OR				
	b	i) Explain merits and demerits of different software life cycle models?	K4	CO1	7M
		ii) Discuss in detail about Spiral model.	K4	CO1	7M
2	Unit-II				
	a	i) Write the properties of a good SRS document.	K4	CO1	7M
		ii) Discuss about the importance of System models?	K4	CO1	7M
	OR				
	b	i) Write notes on Building Blocks of UML.	K2	CO2	7M
		ii) Discuss about the Interaction Diagrams?	K2	CO2	7M
3	Unit-III				
	a	i) Write notes on Activity Diagrams in Software Engineering?	K2	CO2	7M
		ii) Discuss about the Component Diagrams?	K2	CO2	7M
	OR				
	b	i) Write notes on State Chart Diagrams in Software Engineering?	K2	CO2	7M
		ii) Discuss about the Deployment Diagrams?	K2	CO2	7M
4	Unit-IV				
	a	i) Explain about Common Modeling Techniques of Use case diagrams?	K2	CO2	7M
		ii) Discuss about the Analysis Object Model in detail.	K2	CO3	7M
	OR				
	b	i) What are the different patterns involved in Analysis Pattern Template?	K2	CO3	7M
		ii) Explain the Non-Functional Requirements in detail?	K2	CO3	7M
5	Unit-V				
	a	i) Explain different types of Software Design?	K2	CO3	7M
		ii) Discuss about advantages and disadvantages of Architectural Design?	K2	CO3	7M
	OR				
	b	i) What are the principles of software testing?	K4	CO4	7M
		ii) Write notes on Black box testing techniques.	K4	CO4	7M

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC2OE01

REMOTE SENSING AND GIS

Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Define remote sensing. Discuss the different types of remote sensing with examples.	K1	1	7M
		ii) List the various sensors used in LANDSAT AND IRS satellites specifying their spectral and spatial resolutions.	K2	1	7M
	OR				
	b	i) Differentiate between spatial and spectral resolution with examples.	K2	1	7M
	ii) Discuss advantages and disadvantages of different digital image data formats.	K2	1	7M	
Unit-II					
2	a	i) Explain with a neat sketch image to map rectification.	K3	2	7M
		ii) Describe the oriented network analysis with an example.	K2	2	7M
	OR				
	b	i) Explain the concept of image fusion giving its advantages and disadvantages.	K2	2	7M
	ii) What is image classification? Explain the different types of image classification.	K3	2	7M	
Unit-III					
3	a	i) List the different types of GIS data. Explain them in detail.	K2	3	7M
		ii) What is map projection? Why is it important in GIS?	K2	3	7M
	OR				
	b	i) Explain the various components of GIS.	K2	3	7M
	ii) Describe the metric properties of a map.	K3	3	7M	
Unit-IV					
4	a	i) Differentiate between vector and raster data models.	K4	4	7M
		ii) What is raster data compression in GIS? Explain the different types of raster data compression.	K3	4	7M
	OR				
	b	i) What is the necessity of ER Diagram in data models.	K4	4	7M
	ii) What are the differences between TIN and grid data models?	K4	4	7M	
Unit-V					
5	a	i) What is the difference between map projection and datum? List the commonly used datum used in GIS.	K4	5	7M
		ii) Describe the various rules of topological consistency in GIS.	K3	5	7M
	OR				
	b	i) Define coordinate transformation? Explain the different types of coordinate transforms.	K3	5	7M
	ii) Explain the process of GPS Data Integration in detail.	K4	5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC2OE06

INDUSTRIAL ROBOTICS

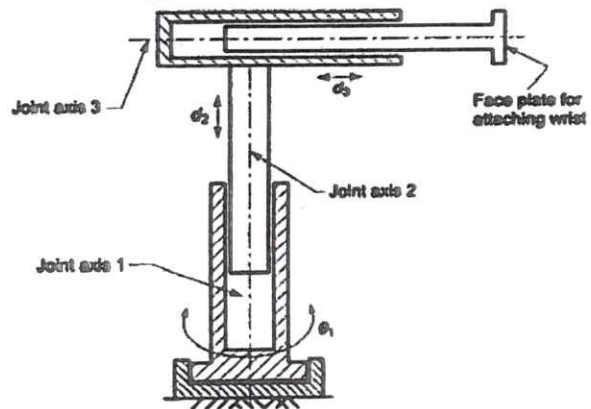
Time: 3 hours

EEE, CSE (AI)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q. No	Questions	KL	CO	M	
Unit-I					
1	a	i) Discuss the major advantages, and dis-advantages of industrial robots.	K2	CO1	7M
		ii) Explain the possible applications of robots other than industrial applications.	K2	CO1	7M
	OR				
	b	Explain in detail the basic components of a Robot system.	K2	CO1	14M
Unit-II					
2	a	i). Discuss the major applications of actuator in robots.	K1	CO2	4M
		ii) What you understand by servomotors? Explain the working of DC servomotor used in robot with neat sketch.	K2	CO2	10M
	OR				
	b	i) What are the different types of stepper motors? Explain any one of them with suitable sketches.	K3	CO2	10M
		ii) Explain the role of actuator in robotics.	K3	CO2	4M
Unit-III					
3	a	Explain the different types of sensors used in robotics.	K3	CO3	14M
	OR				
	b	i) Explain the working of Position sensors.	K2	CO3	7M
		ii) What is the role of sensors in robotics? Explain its application in robots.	K2	CO3	7M
Unit-IV					
4	a	Formulate the forward kinematic model of the three degree of freedom (RPP) manipulator as shown in Figure-1.	K5	CO4	14M
		 <p style="text-align: center;">Figure-1.</p>			

	OR				
	b	i) Explain the Jacobian matrix with example.	K3	CO4	10M
		ii) Describe briefly the kinematics of a robot	K2	CO4	4M
	Unit-V				
5	a	Discuss the applications of robots in loading and unloading of objects.	K3	CO5	14M
	OR				
	b	Explain the requirements and benefits of the robot for continuous arc welding applications.	K3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC20E10

OOPS THROUGH JAVA

Time: 3 hours

(ECE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) What is Object Oriented Programming (OOP)? Explain the need for OOP.	K3	CO1	7M
		ii) What are the principles of Object-Oriented Programming? Explain the concepts of Classes, Objects, Abstraction, Encapsulation, Inheritance, and Polymorphism.	K3	CO2	7M
	OR				
	b	i) What are the differences between Procedural Languages and Object-Oriented Programming? Explain with examples.	K3	CO1	7M
		ii) How can we install JDK 1.8? Explain the steps involved in getting started with JDK, including installation notes, and exploring the JDK.	K3	CO1	7M
2	Unit-II				
	a	i) Write a Java program to declare and initialize variables of different data types, including integers, floating-point numbers, characters, and boolean values. Print their values on the console.	K3	CO2	7M
		ii) What are Identifiers in Java? Explain the naming conventions for identifiers and list the reserved keywords in Java.	K3	CO2	7M
	OR				
	b	i) Explain the concept of expressions in Java. Write a Java program to demonstrate the use of expressions with different operators and operands.	K3	CO2	7M
		ii) What are the different types of flow control constructs in Java? Explain the concepts of branching, conditional statements, and loops with examples.	K3	CO2	7M
3	Unit-III				
	a	i) Explain the concept of inheritance in Java. What are the different types of inheritance, and how are they implemented in Java?	K3	CO3	7M
		ii) What is the final keyword in Java? Explain how it is used to create final classes, final methods, and final variables.	K3	CO3	7M
	OR				
	b	i) What is an abstract class in Java? Explain the concept of abstract methods and how they are implemented in Java.	K3	CO3	7M
		ii) What are exceptions in Java? Explain the different types of exceptions in Java, and how to handle exceptions using try-catch blocks, throw, throws, and finally block.	K3	CO3	7M
4	Unit-IV				
	a	i) Explain the concept of multithreading in Java. What is a thread, and how is it different from a process?	K3	CO4	7M
		ii) What is thread priority in Java, and how is it used to control thread execution? Explain the concept of thread scheduling in Java.	K3	CO4	7M

		OR			
	b	i) What is synchronization in Java, and why is it important in multithreaded programs? Explain how to synchronize methods and statements in Java.	K2	CO4	7M
		ii) How do you use the isAlive() and join() methods to manage threads in Java? Explain the differences between the two methods.	K2	CO4	7M
		Unit-V			
5	a	i) What is an applet in Java, and how is it different from a standalone application? Explain the structure of an applet program in Java.	K3	CO5	7M
		ii) What is the applet lifecycle in Java? Explain the different methods that are called during the lifecycle of an applet, such as init(), start(), stop(), and destroy().	K3	CO5	7M
		OR			
	b	i) How do you use the paint(), update(), and repaint() methods to create graphics in Java applets? Explain the differences between the three methods.	K3	CO5	7M
		ii) What is the Abstract Window Toolkit (AWT) in Java? Explain the components and containers in AWT.	K3	CO5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CC20E13

DIGITAL MARKETING

Time: 3 hours

(ME)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q. NO	QUESTION	KL	CO	MARKS
Unit - I				
1	a Describe the merits of Digital Marketing. Differentiate between Digital Marketing with Traditional Marketing	K6	CO1	[14 M]
	OR			
b	Elucidate the contemporary issues and challenges in Digital Marketing.	K6	CO1	[14 M]
Unit - II				
2	a Distinguish between Email Marketing and Website Marketing.	K5	CO2	[14 M]
	OR			
b	Critically discuss the Online Advertising. Present the recent developments in Online Advertising.	K4	CO2	[14 M]
Unit - III				
3	a Summarize the key constituents in Digital Marketing Plan.	K4	CO3	[14 M]
	OR			
b	Outline the various Trick Banners. Discuss the limitations of Mobile Marketing.	K4	CO3	[14 M]
Unit - IV				
4	a Classify the various types of Search Engine Optimations.	K2	CO4	[14 M]
	OR			
b	Describe the Cost per thousand and Cost per Click.	K6	CO4	[14 M]
Unit - V				
5.	a State the merits of Social Customer Relationship Management.	K4	CO5	[14 M]
	OR			
b	Write about the Digital Media and Website Performance.	K3	CO5	[14 M]

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CE3201

DESIGN AND DRAWING OF STEEL STRUCTURES

Time: 3 hours

(CE)

Max. Marks: 70

**Answer any ONE Question from Part - A & Any THREE Questions
from Part - B**

Q.No	Questions	KL	CO	Marks
PART A				
1	Design and Drawing of Gantry girder, without lateral restraint along its span, to be used in an industrial building carrying over head travelling crane for the following data: Centre - to - centre distance between columns = 6m (span of the Gantry girder) Crane capacity = 50KN Self weight of the Crane girder without trolley = 40KN Self weight of the trolley, Electric motor, hook, etc. =10KN Minimum hook approach =1.0m Wheel centers =3m Centre - to - centre distance between gantry rails =12m (Span of crane) Self weight of rail section= 100N/m Yield stress of steel= 250N/mm ²	K4	5	[28M]
OR				
2	Design and draw a built up column with two channels toe to toe to carry a factored load of 2000KN. Take the effective length as 5.5 m a) Design it as a laced column and also design the lacings. b) Design it as a battened column and also design the battens	K4	5	[28M]
PART B				
3	What are the advantages and disadvantages of welding? Explain about Beam to column connections with neat sketches?	K2	1	[14M]
4	Design a column with single lacing system to carry a factored axial load of 1500 KN. The effective height of the column is 4.2 m. Use two channels placed toe to toe.	K4	2	[14M]
5	A simply supported beam spanning 5m carrying a udl of 3KN/m including its selfweight . Floor construction restrains it against lateral buckling. What size of beam is required with $f_y = 250\text{MPa}$?	K2	3	[14M]
6	Design a suitable slab base for a column section ISHB 400 @ 822 N/m. Supporting an axial load 500 KN. The base plate is to rest on a concrete pedestal of M20 grade concrete.	K4	4	[14M]
7	a) Explain the design principles of Gantry Girder b) List out various elements of the truss and mark all its significance	K2	5	[7M] [7M]

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CE3202

ENVIRONMENTAL ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Enumerate the methods you can adopt for determining the total water requirement of a community.	K3	1	7M
		ii) Sketch and explain direct intake from a river and intake tower in a reservoir.	K2	1	7M
	OR				
	b	i) Discuss the advantages and disadvantages of underground and surface sources of public water supply.	K2	1	7M
	ii) What points are to be considered in selecting a suitable site for the location of an impounding reservoir which is to be constructed for supplying water to a town?	K3	1	7M	
2	Unit-II				
	a	A water treatment plant treats 250 m ³ /h of water. Workout the following with respect to a flocculator: Dimensions of the flocculator unit, power input by paddle to water, size and number of paddles. Assume water temperature = 25°C and with absolute viscosity = 0.89 X 10 ⁻³ Nm/s. Assume any other data suitably. Draw the sketch of flocculation and the paddles.	K3	2	14M
	OR				
b	Calculate the head losses and the corrected flows in the various pipes of a distribution network as shown in figure 1. The diameters and the lengths of the pipes used are given against each pipe. Compute corrected flows after one correction.	K3	2	14M	
<p style="text-align: center;">Fig. 1</p>					
3	Unit-III				
	a	i) Discuss the comparative merits and demerits of the separate system and combined system of sewerage.	K4	3	7M
		ii) Explain self-purification of streams and indicate how sunlight helps in self-purification.	K2	3	7M

	OR			
	i) State the types of sewers used in sewerage system, giving their use in sewerage systems, giving their sketches. Comment on their hydraulic properties.	K4	3	7M
b	ii) Write in brief: (A) Minimum DO content in polluted streams for survival of aquatic life (B) BOD and COD (C) Sewage irrigation.	K2	3	7M
	Unit-IV			
	i) Mention the various sewer appurtenances used in sewerage scheme and state the location and utility of each.	K2	4	10M
	ii) Design the sewer for a discharge of 650 l/s running full.	K4	4	4M
4	OR			
	i) State the pumps usually employed for the pumping of sewage and sludge.	K2	4	4M
b	ii) In designing a rectangular grit chamber for the following data: Flow = 40 MLD; grit of specific gravity = 2.65 and size = 0.2 mm to be removed. Find the settling velocity of 0.2 mm particles, critical horizontal velocity of flow and size of grit chamber.	K4	4	10M
	Unit-V			
	i) Write a short principle of anaerobic sludge digestion.	K2	5	5M
a	ii) Calculate the sludge volume index for a mixed liquor with 250 mg/lit suspended solids having settled volume of 190 ml with a litres samples. Is this sludge volume index good or poor?	K3	5	9M
	OR			
5	i) Discuss the factors which influence the working of a trickling filter.	K2	5	5M
b	ii) Design an oxidation pond for treating domestic sewage of 10,000 persons supplied with 100 litres per capita water per day. The BOD and suspended solids are each of 300 mg/lit. Permissible organic loading for the pond is not less than 500 kg/ha. The detention period is not to exceed 6 days. Assume width of the pond to its length as 1:2 and the operational depth is 1.2 m. Assume any other suitable data.	K3	5	9M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CE3203

HYDROLOGY AND IRRIGATION ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M			
Unit-I							
1	a	i) Describe the hydrologic cycle. Explain briefly humankind's interference in various parts of this cycle.			K2	C01	7M
		ii) what are different applications of hydrology			K2	C01	7M
	OR						
	b	i) What are the different types of rain gauges and explain the working of the non-recording rain gauge used in India?			K2	C01	7M
ii) Describe different forms of precipitation and types of precipitation.			K2	C01	7M		
Unit-II							
2	a	i. Explain evaporation process. Describe various factors that affect rate of evaporation.			K3	C02	7M
		ii. Describe the various abstractions from precipitation.			K3	C02	7M
	OR						
	b	i. What is infiltration? Explain the different methods of measuring infiltration. How would you use infiltration capacity curve to calculate runoff from a small catchment?			K3	C02	7M
ii. How do you measure evapotranspiration using a Lysimeter?			K3	C02	7M		
Unit-III							
3	a	i. Discuss the various factors, which affect the runoff from a basin.			K2	C03	7M
		ii) What equipment will you use for making velocity measurements in a stream? Explain.			K2	C03	7M
	OR						
	b	i) A steady 6-hour rainfall with intensity of 4 cm/hr produces a peak discharge of 560 cumec. The average storm loss can be assumed as 1cm/hr and base flow 20 cumec. What is the peak discharge of the unit hydrograph and its duration? On the same basin, determine the peak discharge from a 6-hour rainfall at an intensity of 3.5 cm/hr assuming an average loss rate of 1.5 cm/hr and base flow of 15 cumec.			K3	C03	7M
ii) Explain the use of the unit hydrograph in the construction of the flood hydrograph resulting from two or more periods of rainfall.			K3	C03	7M		
Unit-IV							
4	a	i) State and explain Darcy's law.			K2	C04	7M
		ii) With a neat sketch explain about unconfined and unconfined aquifers.			K2	C04	7M
	OR						
	b	i) A 15 cm diameter well penetrates an 8 m thick water bearing strata underlain and overlain by impermeable beds. The well was operated with a constant discharge rate of 100 liters/min for 12 hours. The steady state draw downs were 3 and 0.05 m at distance 10 m and 50 m, respectively from the well. Using This equations calculate the transmissibility and hydraulic conductivity of the aquifer.			K3	C04	10M
ii) What is dupuit's equation?			K3	C04	4M		

Unit-V					
5	a	i) Define irrigation? What is the necessity of irrigation? write types of irrigation.	K2	C05	10M
		ii) mention the different methods irrigation	K2	C05	4M
	OR				
	b	Compute the depth and frequency of irrigation required for a certain crop with data given below: Root zone depth = 100 cm; Field capacity = 22 %; Wilting point = 12 %; Dry density of soil = 1.5 g/cc; Consumptive use = 25 mm/day; Efficiency of irrigation = 50%.	K3	C05	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CE3204

FOUNDATION ENGINEERING

Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70)

Q.No	Questions	KL	CO	M
Unit-I				
1	a Describe with the help of neat sketch the wash boring method of subsoil exploration in what type of soils this method is recommended? what are the limitations of this method?	2	1	14M
	OR			
	b i) Discuss briefly the method of taking undisturbed samples in I. Non-cohesive soils ii Cohesive soils. ii) Write a brief note on Electrical Resistivity method of soil Exploration?	2	1	7M
Unit-II				
2	a How do you distinguish a finite slope from an infinite slope? What are the various types of failures that are likely to occur in finite slopes? Under what circumstances do they occur? Explain with sketches.	2	2	14M
	OR			
	b What is Coulombs Wedge theory of earth pressure? Derive the condition for obtaining the maximum active earth pressure	2	2	14M
Unit-III				
3	a i) What are the assumptions made Terzaghis analysis of bearing capacity?	2	3	7M
	ii) A strip footing 1m wide rests on the surface of dry Cohesion less soil having $\phi=25^\circ$ and $\gamma = 1.8t/m^3$, what is the ultimate bearing capacity ? what is its value if there as complete flooding Assume , $N_q=12$, $N_\gamma =10$.	3	3	7M
	OR			
	b i) What are the differences between Terzaghis bearing capacity theory and Mayerhof bearing capacity theory.	2	3	7M
	ii) Bring out clearly the effect of ground water table on the safe bearing capacity	2	3	7M
Unit-IV				
4	a Differentiate between i. Shallow foundation and deep foundation, ii. Gross and net bearing capacity, iii. Safe bearing capacity and soil pressure	2	4	7M
	ii) What are the different types of settlements which can occur in a foundation? How are these estimated?	2	4	7M
	OR			
	b i) What are the limitations of plate load test?	2	4	7M
	ii) Describe the procedure of determining the safe bearing capacity based on the standard penetration test?	2	4	7M

5	Unit-V				
	a	i) Briefly explain how the load carrying capacity of a pile is determined using pile load test?	2	5	7M
		ii) Sketch a completed well foundation for a Bridge pier. Indicate the various components and their functions.	2	5	7M
	OR				
	b	i) Discuss the various forces acting on a well foundation?	2	5	7M
ii) Write a brief note on tilts and shifts. Discuss the remedial measures to control tilts and shifts		2	5	7M	

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CEHN08 RURAL WATER SUPPLY AND SANITATION

Time: 3 hours

(CE)

Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Explain traditional sources of water in rural areas.	K2	C01	7M
		ii) List and explain different types of water born diseases with precautionary measures to be taken to control the water borne diseases.	K1	C01	7M
	OR				
	b	i) Explain the factors to be considered in the selection of water in formulating a rural water supply project.	K2	C01	7M
		ii) Write about waste related standards and philosophy.	K2	C01	7M
2	Unit-II				
	a	i) what are the norms of rate of water supply in rural areas as per government of India?	K2	C02	7M
		ii) Explain the National Rural Drinking Water program.	K2	C02	7M
	OR				
	b	i) what are the standards of water quality in rural area. Explain water quality surveillance.	K2	C02	7M
		ii) Write about operation and maintenance of rural water supplies.	K1	C02	7M
3	Unit-III				
	a	i) Explain the Epidemiological aspects of water quality.	K2	C03	7M
		ii) write short notes on following a) Slow sand filter b) Disinfection of rural water sources. c) Fluoride problem and its control.	K2	C03	7M
	OR				
	b	i) what are the different methods of low cost water treatment.	K2	C03	7M
		ii) Draw the flow diagram of treatment of water.	K2	C03	7M
4	Unit-IV				
	a	i) what are the main objectives of Rural sanitation in villages ?.	K1	C04	7M
		ii) with the aid of neat sketch, explain Pit Privy and Aqua Privy types of latrines used for rural sanitation.	K2	C04	7M
	OR				
	b	i) Sketch and design a septic tank for 100 users. Describe the working of a septic tank and the pollution problem associated with it.	K3	C04	9M
		ii) Write about Grey water and storm water management.	K3	C04	5M
5	Unit-V				
	a	i) What are the specific issues and problem encountered with rural sanitation? Explain in detail.	K1	C05	7M
		ii) explain the treatment of solid waste by using bio-gas plant.	K1	C05	7M

	OR				
	b	i) Write about incineration and salvaging disposal methods with advantages and disadvantages.	K2	C05	7M
		ii) What do you understand by the sanitary land filling. Discuss the physical tests of solid waste.	K2	C05	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EE3201 MICROPROCESSOR AND MICROCONTROLLERS

Time: 3 hours

(EEE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Discuss about the memory segmentation in 8086 processor.	2	1	7M
		ii) List basic features of 80286 microprocessor.	2	1	7M
	OR				
	b	i) Explain the segmented memory organization structure of 8086 and also discuss the advantages.	2	1	7M
		ii) List basic features of 80386 microprocessor.	2	1	7M
2	Unit-II				
	a	i) Discuss about minimum mode of operations of 8086 microprocessors.	3	2	7M
		ii) Explain any four addressing modes with an example.	2	2	7M
	OR				
	b	i) Draw the Timing diagrams of 8086.	3	2	7M
		ii) Explain about the Instruction set of 8086 microprocessors.	2	2	7M
3	Unit-III				
	a	i) Write an 8086 Assembler Program that adds two given 4-digit BCD numbers.	2	3	7M
		ii) Write an ALP to find the multiplication of two 16-bit Hex numbers?	2	3	7M
	OR				
	b	i) Write a program to implement FOR loop using instructions of 8086.	2	3	7M
		ii) What is a MACRO? How do you pass parameters to MACRO's?	2	3	7M
4	Unit-IV				
	a	i) What are the registers available in 8257? What are their functions?	2	4	7M
		ii) Explain the architecture and operation of 8257 DMA controller with a neat block diagram.	2	4	7M
	OR				
	b	i) Discuss about the initialization command words of 8259 and their sequence in detail.	2	4	7M
		ii) Draw block diagram of 8255 and explain its modes of operation.	3	4	7M
5	Unit-V				
	a	i) Explain the memory organization of 8051 microcontroller.	2	5	7M
		ii) Draw and Explain the pin diagram of 8051.	3	5	7M
	OR				
	b	i) Explain the data types and assembler directives of 8051.	2	5	7M
		ii) Explain how interrupts are handled in 8051.	2	5	7M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EE3202

POWER SYSTEM ANALYSIS

Time: 3 hours

(EEE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1	Unit-I				
	a	i) Compare the single phase and three phase systems in per unit quantities?	3	1	7M
		ii) A three phase alternator with a rating of 14MVA, 22kV has its armature resistance of 11 ohms per phase and synchronous reactance of 71 ohms per phase. Find the per unit impedance of the alternator?	3	1	7M
	OR				
	b	i) Explain the concept of element node incidence matrix with suitable example?	2	1	7M
		ii) A single phase transformer of 8.6kV/440V, 50Hz, 155kVA has primary resistance and reactances are 3 ohms and 11 ohms, the secondary resistance and reactances are 0.02 ohms and 0.07 ohms respectively. Determine the per unit values of the transformer?	3	1	7M
2	Unit-II				
	a	i) Derive and analyze the static power flow equations of a 3 machine power system?	3	2	7M
		ii) Describe the Newton Raphson method in polar coordinates form with relevant equations?	2	2	7M
	OR				
	b	i) Draw the flow chart of Gauss Seidel method of power flow analysis?	2	2	7M
		ii) Elaborate the fast decoupled method applied to a 3 bus power system network?	3	2	7M
3	Unit-III				
	a	i) Derive the expression for power of a 3 phase circuit in terms of symmetrical components?	3	3	7M
		ii) Describe the components of short circuit MVA and derive it for a three phase system?	3	3	7M
	OR				
	b	i) Draw and analyze the properties of sequence networks?	3	3	7M
		ii) The line to ground voltages on high voltage side of a step up transformer are 88kV, 30kV and 42kV on phase R, Y and B respectively. The voltage of phase 'R' leads that of phase 'Y' by 104° and lags that of phase 'B' by 186.7°. Find the symmetrical component of the voltages?	3	3	7M
4	Unit-IV				
	a	i) Derive the expression for the fault current in the occurrence of line to ground fault on an alternator?	3	4	7M
		ii) Explain in detail about the existence of un symmetrical faults in a power system network?	2	4	7M

OR						
b	i)	Obtain the sequence network of an alternator affected by a line to line fault?	2	4	7M	
	ii)	A synchronous generator of rating 15MVA, 50Hz and has sequence reactances of 33%, 11% and 6% to positive, negative and zero respectively. It is connected to a line of having 3 conductors of 1.2 cm diameter arranged in triangle spacing 5.7m aside. The synchronous generator is excited to give 32kV on open circuit. Find the currents in the line when two lines are short circuited at a distance of 25km along the line by assuming resistance is zero?	3	4	7M	
Unit-V						
5	a	i)	Memorize the methods to improve the steady state stability of the power system?	2	5	7M
		ii)	Draw and explain about the power angle curve in the stability analysis of power system?	2	5	7M
	OR					
	b	i)	Memorize the methods to improve the transient stability of the power system?	2	5	7M
ii)		Explain the application of equal area criterion for the stability analysis?	2	5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EE3203

MEASUREMENTS AND INSTRUMENTATION

Time: 3 hours

(EEE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1	Unit-I				
	a	i) Discuss in detail about the dynamic characteristics of measuring instruments?	2	1	7M
		ii) Elaborate the statistical analysis of measurement data and write its outcomes?	2	1	7M
	OR				
b	i) Describe the principle of operation of digital voltmeters?	2	1	14M	
2	Unit-II				
	a	i) Compare the construction and features of current transformer and potential transformers?	3	2	7M
		ii) Draw the circuit diagram and explain the operation of phase measurement instrument?	2	2	7M
	OR				
b	i) Compare single phase and 3 phase watt meters by drawing the connection diagrams?	3	2	7M	
	ii) A ring type current transformer has a ratio of 1800/8. When operating at rated primary current with a secondary burden of non inductive resistance of 2.8 ohms, takes a no-load current of 2.6A at 0.4 power factor. Find the phase angle difference between primary and secondary currents and the ratio error at full load?	3	2	7M	
3	Unit-III				
	a	i) List out and explain the grounding methods with disadvantages?	2	3	7M
		ii) Draw the bridge diagram and obtain the balance condition of wheat stone bridge?	2	3	7M
	OR				
b	i) What is the principle of operation of D.C potentiometer? Explain with neat diagram.	2	3	7M	
	ii) The 4 arms of a bridge are connected as follows: Arm AB: A choke coil L_1 with an equivalent series resistance r_1 . Arm BC: non inductive resistance R_3 . Arm CD: A mica capacitor C_4 in series a non inductive resistance R_4 . Arm DA: A non inductive resistance R_2 . When the bridge is supplied from a source of 440 Hz is given between terminals A and C and the detector is connected between nodes B and D, balance is obtained the following conditions: $R_2=2210$ ohms, $R_3= 555$ ohms, $C_4=0.4$ micro farad and $R_4=52.5$ ohms. Series resistance of the capacitor is 0.7 ohms. Find the resistance and inductance of the choke coil?	3	3	7M	
4	Unit-IV				
	a	i) Describe the principle of operation of digital CRO with their applications?	2	4	7M
		ii) Compare the design aspects of LCD and LED devices?	2	4	7M

OR						
	b	i)	Discuss in detail about the principle of operation of digital printers?	2	4	7M
		ii)	Compare the characteristic features of magnetic disk and magnetic tapes with their applications?	2	4	7M
Unit-V						
5	a	i)	List out and explain the basic requirements of a transducer?	2	5	7M
		ii)	Explain the principle of operation of LVDT with neat circuit diagram	3	5	7M
	OR					
	b	i)	Draw the diagram and explain the differential arrangement of capacitive transducer?	2	5	7M
ii)		Elaborate the properties and applications of digital transducer with diagram?	2	5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EE3205

ELECTRIC DRIVES

Time: 3 hours

(EEE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M		
Unit-I						
1	a	i)	Draw the block diagram and explain in detail about the electrical drive operation?	2	1	7M
		ii)	A motor drives two loads. One has rotational motion. It is coupled through a reduction gear with $a = 0.2$ and efficiency of 84%. The load has a moment of inertia of 11 kg-m^2 and a torque of 8 N-m . The other load has translational motion and consists of 880 kg weight to be lifted up at a uniform speed of 1.7 m/s . The coupling between this load and the motor has an efficiency of 76%. The motor has inertia of 0.5 kg-m^2 and runs at a constant speed of 1355 r.p.m . Find the equivalent inertia referred to the motor shaft and the power developed by the motor?	3	1	7M
	OR					
	b	i)	Explain in detail about the four quadrant operation of a motor driving the hoist load?	2	1	7M
	ii)	Elaborate the friction torque and its components with relevant diagrams?	2	1	7M	
Unit-II						
2	a	i)	Analyze the discontinuous conduction mode of operation of single phase fully controlled rectifier control of DC separately excited motor?	3	2	7M
		ii)	Discuss in detail about the characteristic features of dual converter fed DC motor drives?	2	2	7M
	OR					
	b	i)	Analyze the continuous conduction mode of operation of single phase fully controlled rectifier control of DC separately excited motor?	3	2	7M
	ii)	A 190 V , 866 r.p.m , 148 A separately excited DC motor has an armature resistance of 0.07 ohms . It is fed from a single phase fully controlled rectifier with an AC source voltage of 210 V , 50 Hz . Assuming the continuous conduction, find a) The firing angle for rated motor torque and 740 r.p.m . b) Firing angle for rated motor torque and $(-480) \text{ r.p.m}$. c) Motor speed for $\alpha = 155^\circ$ and rated torque?	3	2	7M	
Unit-III						
3	a	i)	Explain in detail about the operation of two quadrant DC-DC converter fed self excited DC motors?	2	3	7M
		ii)	Draw and explain the speed torque characteristics of DC-DC converter fed DC motor drives?	2	3	7M
	OR					
	b	i)	Explain in detail about the operation of two quadrant DC-DC converter fed separately excited DC motors?	2	3	7M
	ii)	Discuss the objectives and outcomes of closed loop operation of DC-DC converter fed DC motor drives?	2	3	7M	

Unit-IV						
4	a	i)	Memorize the advantages and applications of static Kramer drive?	2	4	7M
		ii)	Explain in detail about the variable frequency control of induction motor by using PWM voltage source inverter?	2	4	7M
	OR					
	b	i)	Draw and analyze the speed torque characteristics of static Kramer drive?	2	4	7M
ii)		Describe the closed loop V/f control of induction motor drives with necessary expressions?	2	4	7M	
Unit-V						
5	a	i)	Draw the diagram and explain the separate control of synchronous motor?	2	5	7M
		ii)	Describe the basic operation of PMSM with neat diagram?	2	5	7M
	OR					
		i)	Draw the block diagram and explain the closed loop control of synchronous motor drive?	2	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B. Tech II Semester Regular Examinations, April-2023

Sub Code: R20ME3201

DESIGN OF MACHINE ELEMENTS-II

Time: 3 hours

(ME)

Max. Marks: 70

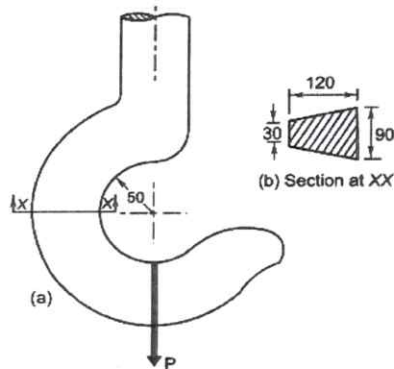
Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q. No	Questions	KL	CO	M
Unit-I				
1	<p>a Solve the following problem. Design a journal bearing for a centrifugal pump from the following data: Load on the journal = 20000 N, Speed of the journal = 900 r.p.m, Type of oil is SAE 10, (Take absolute viscosity at 55°C = 0.017 kg/m-s), Ambient temperature of oil = 15.5°C, Maximum bearing pressure for the pump = 1.5 N / mm². Calculate also mass of the lubricating oil required for artificial cooling, if rise of temperature of oil be limited to 10°C. Heat dissipation coefficient = 1232 W/m²/°C.</p>	K3	CO1	14M
	OR			
	<p>b i) What are rolling contact bearings? Discuss their advantages over sliding contact bearings. ii) Explain the following terms as applied to journal bearings: (a) Bearing characteristic number; and (b) Bearing modulus</p>	K2	CO1	7M
Unit-II				
2	<p>a Solve the following problem. Design a suitable connecting rod for a car with the following data: Piston diameter = 68 mm, Stroke length = 80 mm, Length of connecting rod = 160 mm, Maximum explosion pressure = 3.5 Mpa, Weight of the reciprocating parts = 2.5 kg, Speed = 4000 rpm and Compression ratio 8:1</p>	K3	CO2	14M
	OR			
	<p>b Discuss the design of Center Crankshaft when the crank shaft is at dead center.</p>	K2	CO2	14M
Unit-III				
3	<p>a Solve the following problem. Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = 100 mm, Stroke = 125 mm, Maximum gas pressure = 5 N/mm². Indicated mean effective pressure = 0.75 N/mm². Mechanical efficiency = 80%, Fuel consumption = 0.15 kg per brake power per hour, Higher calorific value of fuel = 42 × 10³ kJ/kg, Speed = 2000 r.p.m. Any other data required for the design may be assumed.</p>	K3	CO3	14M
	OR			
	<p>b Solve the following problem. A four-stroke diesel engine has the following specifications: Brake power = 5 kW, Speed = 1200 r.p.m. Indicated mean effective pressure = 0.35 N / mm² Mechanical efficiency = 80 %. Determine: 1. bore and length of the cylinder; 2. thickness of the cylinder head and 3. size of studs for the cylinder head.</p>	K3	CO3	14M

Unit-IV

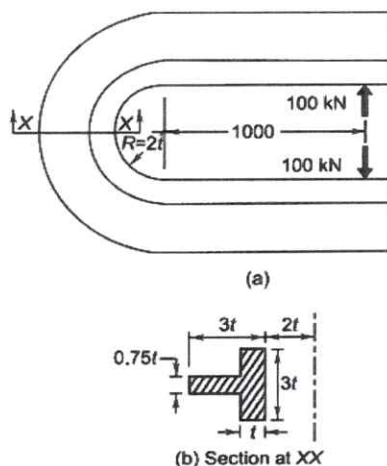
A crane hook having an approximate trapezoidal cross-section is shown in **Figure. I**. It is made of plain carbon steel 45C8 [yield strength (S_{yt}) = 380 N/mm²] and the factor of safety is 3.5. Determine the load carrying capacity of the hook.



K3 CO4 14M

OR

The C-frame of a 100 kN capacity press is shown in Figure-2 (a & b). The material of the frame is grey cast iron FG 200, and the factor of safety is 3. Determine the dimensions of the frame.



K3 CO4 14M

Unit-V

Two pulleys, one 450 mm diameter and the other 200 mm diameter, on parallel shafts 1.95 m apart are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min, if the maximum permissible tension in the belt is 1 kN, and the coefficient of friction between the belt and pulley is 0.25?

K3 CO5 14M

OR

Two shafts whose centres are 1 metre apart are connected by a V-belt drive. The driving pulley is supplied with 95 kW power and has an effective diameter of 300 mm. It runs at 1000 r.p.m. while the driven pulley runs at 375 r.p.m. The angle of groove on the pulleys is 40°. Permissible tension in 400 mm² cross-sectional area belt is 2.1 MPa. The material of the belt has density of 1100 kg / m³. The driven pulley is overhung, the distance of the centre from the nearest bearing being 200 mm. The coefficient of friction between belt and pulley rim is 0.28.

K3 CO5 14M

Estimate the followings:

1. The number of belts required; and
2. Diameter of driven pulley shaft, if permissible shear stress is 42 Mpa.

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20ME3202

HEAT TRANSFER

Time: 3 hours

(ME)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Derive general heat conduction equation for isotropic material in cylindrical co-ordinates	3	1	7M
		ii) What do you mean by boundary and initial condition?	2	1	7M
	OR				
	b	Derive the heat conduction equation in a cartesian coordinate system.	3	1	14M
Unit-II					
2	a	i) What criteria are considered while designing and selecting a fin?. Also derive fin equation	3	2	7M
		ii) A long carbon steel rod length 40 cm and diameter 10 mm ($K = 40 \text{ W/mK}$) is placed in such that one of its end is at 400°C and the ambient temperature is 30°C . The film coefficient is $10 \text{ W/m}^2\text{K}$. Determine: (i) Temperature at mid length of the fin. (ii) Fin efficiency. (iii) Heat transfer rate from the fin.	3	2	7M
	OR				
		b	i) Give the values of characteristic dimensions (LC) used in lumped analysis for following cases: (i) Sphere. (ii) Cylinder. (iii) Plate.	2	2
		ii) A steel ball [$c = 0.46 \text{ kJ/kg }^\circ\text{C}$, $k = 35 \text{ W/m }^\circ\text{C}$] 5.0 cm in diameter and initially at a uniform temperature of 450°C is suddenly placed in a controlled environment in which the temperature is maintained at 100°C . The convection heat-transfer coefficient is $10 \text{ W/m}^2\text{ }^\circ\text{C}$. Calculate the time required for the ball to attain a temperature of 150°C .	3	2	7M
Unit-III					
3	a	i) State Buckingham pi theorem. What are the merits and demerits?	2	3	7M
		ii) Air at 200 kPa and 200°C is heated as it flows through a tube with a diameter of 25 mm at a velocity of 10 m/sec. The wall temperature is maintained constant and is 20°C above the air temperature all along the length of tube. Calculate: (i) The rate of heat transfer per unit length of the tube. (ii) Increase in the bulk temperature of air over a 3 m length of the tube.	3	3	7M
	OR				
		b	i) Briefly discuss about the convective heat transfer in a horizontal pipe flow.	2	3
		ii) Engine oil at 20°C flows with a velocity of 1 m/s across a 2.5 cm diameter tube which is maintained at 100°C . Determine the average heat transfer coefficient and rate of heat transfer per m length of the tube.	3	3	7M
Unit-IV					
4	a	Determine the heat transfer rate by free convection from a plate $0.3\text{m} \times 0.3\text{m}$ for which one surface is insulated and the other surface is maintained at 110°C and exposed to atmosphere air at 30°C for the following arrangements: i). The plate is vertical ii). The plate is horizontal with the heating surface facing up iii). The plate is horizontal with the heating surface facing down.	3	4	14M
	OR				
		b	i) Explain the concept of LMTD for a counter flow heat exchanger.	2	4
		ii) Explain NTU method of design of heat exchanger	2	4	7M

Unit-V

5	a	i) What are the three boiling regimes and show the regimes on a boiling curve?	2	5	7M
		ii) Estimate the power required to boil water in a copper pan, 0.35m in diameter. The pan is maintained at 120°C by an electric heater. What is the evaporation rate? Estimate the critical heat flux.	3	5	7M
	OR				
	b	i) Write short notes on: Radiation heat exchange between black surfaces and Radiation shields. Explain transmittivity, reflectivity and absorptivity	2	5	7M
	ii) Two circular disc of diameter 20cm each are placed 2m apart. Calculate the radiant heat exchange for these plates if these are maintained at 800°C and 300°C respectively and their corresponding emissivity's are 0.3 and 0.5.	3	5	7M	

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20ME3203

DYNAMICS OF MACHINERY

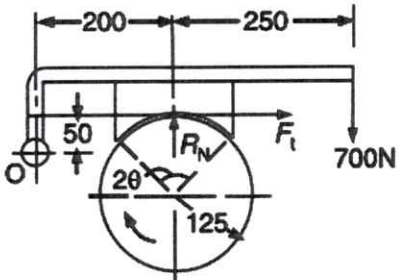
Time: 3 hours

(ME)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	<p>a</p> <p>The turbine rotor of a ship has a mass of 2000 kg and rotates at a speed of 3000 r.p.m. clockwise when looking from a stern. The radius of gyration of the rotor is 0.5 m. Determine the gyroscopic couple and its effects upon the ship when the ship is steering to the right in a curve of 100 m radius at a speed of 16.1 knots (1 knot = 1855 m/hr).</p> <p>Calculate also the torque and its effects when the ship is pitching in simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 50 seconds and the total angular displacement between the two extreme positions of pitching is 12°. Find the maximum acceleration during pitching motion.</p>	K3	CO1	14M
	OR			
	<p>b</p> <p>Define gyroscopic effect. With usual notation and diagram, derive an expression for gyroscopic couple produced by a rotating disc.</p>	K1	CO1	14M
Unit-II				
2	<p>a</p> <p>i) Describe with a neat sketch the working of a single plate friction clutch</p> <p>ii) Discuss the various types of brakes with neat sketches.</p>	K3	CO1	7M
	OR			
	<p>b</p> <p>i) A single block brake is shown in Figure.1. The diameter of the drum is 250 mm and the angle of contact is 90°. If the operating force of 700 N is applied at the end of a lever and the coefficient of friction between the drum and the lining is 0.35, determine the torque that may be transmitted by the block brake.</p> <div style="text-align: center;">  <p style="text-align: center;">All dimensions in mm. <i>Figure.1.</i></p> </div>	K3	CO2	7M
	<p>ii) A single plate clutch, with both sides effective, has outer and inner diameters 300 mm and 200 mm respectively. The maximum intensity of pressure at any point in the contact surface is not to exceed 0.1 N/mm^2. If the coefficient of friction is 0.3, determine the power transmitted by a clutch at a speed 2500 r.p.m.</p>	K2	CO2	7M
Unit-III				
3	<p>a</p> <p>i) Define and explain the following terms relating to governors: 1. Stability, 2. Sensitiveness, 3. Isochronism, and 4. Hunting</p>	K2	CO3	7M
	<p>ii) A Porter governor has all four arms 250 mm long. The upper arms are attached on the axis of rotation and the lower arms are attached to the sleeve at a distance of 30 mm from the axis. The mass of each ball is 5 kg and the sleeve has a mass of 50kg. The extreme radii of rotation are 150 mm and 200 mm. Determine the range of speed of the governor.</p>	K3	CO3	7M

		OR			
	b	i) Compare the differences between governors and flywheel	K3	CO3	7M
		ii) Explain the turning moment diagram of a four-stroke cycle internal combustion engine.	K2	CO3	7M
		Unit-IV			
4	a	A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	K5	CO4	14M
		OR			
	b	i) Explain the method of balancing of different masses revolving in the same plane.	K2	CO4	7M
		ii) Justify the need of balancing of rotating parts for high-speed engine. What is the difference between static and dynamic balancing?	K2	CO4	7M
		Unit-V			
5	a	i) A single cylinder reciprocating engine has speed 240 r.p.m., stroke 300 mm, mass of reciprocating parts 50 kg, mass of revolving parts at 150 mm radius 37 kg. If two-third of the reciprocating parts and all the revolving parts are to be balanced, Determine the followings: 1. The balance mass required at a radius of 400 mm, and 2. The residual unbalanced force when the crank has rotated 60° from top dead centre	K3	CO5	7M
		ii) The reciprocating mass per cylinder in a 60° V-twin engine is 1.5 kg. The stroke and connecting rod length are 100 mm and 250 mm respectively. If the engine runs at 2500 r.p.m., determine the maximum and minimum values of the primary and secondary forces. Also find out the crank position corresponding these values.	K4	CO5	7M
		OR			
	b	The following data refer to two-cylinder locomotive with cranks at 90° : Reciprocating mass per cylinder = 300 kg Crank radius = 0.3 m Driving wheel diameter = 1.8 m Distance between cylinder centre lines = 0.65 m Distance between the driving wheel central planes = 1.55 m. Determine the followings: 1. the fraction of the reciprocating masses to be balanced if the hammer blow is not to exceed 46 kN at 96.5 km. p.h. 2. the variation in tractive effort; and 3. the maximum swaying couple.	K3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20ME3207

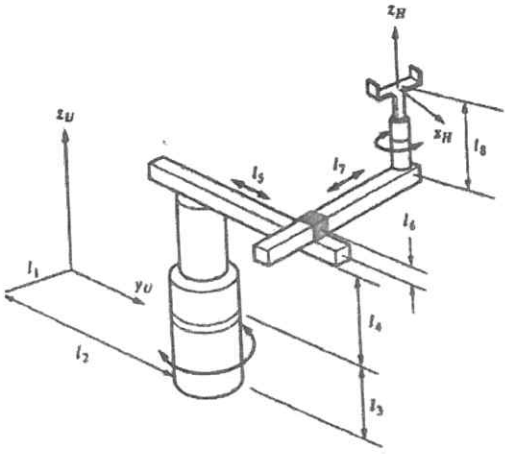
ROBOTICS AND APPLICATIONS

Time: 3 hours

(ME)

Max. Marks: 70

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) Explain about Robot components in detail with neat sketch	K2	CO1	7M
		ii) List advantages and disadvantages of automation	K2	CO1	7M
	OR				
b	For the point [4 8 6] perform the following operations: a) Rotate 30° about X-axis b) Translate 8 units along y-axis c) Rotate 30° about x then translate 6 units along Y- axis d) Rotate 90° about z-axis.	K3	CO1	14M	
2	Unit-II				
	a	i) Describe the working of brushless-DC motors and give its advantages and limitations	K4	CO2	7M
		ii) Explain different types of Hydraulic actuators used in robotics?	K2	CO2	7M
	OR				
b	i) Briefly explain sensors with neat sketch ii) What are the advantages and disadvantages of stepper motors over dc servo motors?	K4 K2	CO2 CO2	7M 7M	
3	Unit-III				
	a	i) Explain about homogeneous Transformations in Robotics kinematics.	K3	CO3	7M
		ii) Explain Kinematics chain of robots with neat sketch	K3	CO3	7M
	OR				
b	For the four degree of freedom robot depicted in figure: i) Assign appropriate frames for D-H representation. ii) Fill out the parameter table containing θ, d, a, α iii) write an equation in terms of A matrices that show how ${}^U T_H$ can be calculated	K3	CO3	14M	
 <p>The diagram shows a 4-DOF robot arm with a base joint (revolute) and three prismatic joints. The base joint is along the z_U axis. The first prismatic joint is along the x_U axis, the second along the y_U axis, and the third along the z_H axis. Link lengths are labeled as $l_1, l_2, l_3, l_4, l_5, l_6, l_7, l_8$. The end effector is a gripper. Coordinate frames are shown at the base (z_U, x_U, y_U) and at the end effector (z_H).</p>					

Unit-IV					
4	a	i) Determine the equations of motion for 2DOF RR- planar manipulator arm using Lagrange-Euler Formulation.	K3	CO4	7M
		ii) Make a comparison of Newton-Euler and Lagrange-Euler formulations and state the situation when you will prefer Newton-Euler and when you will prefer Lagrange-Euler formulation	K3	CO4	7M
	OR				
	b	It is desired to place the origin of the hand frame of a cylindrical robot at [3,4,7]. Solve for joint variables of the robot.	K3	CO4	14M
Unit-V					
5	a	i) Explain the importance of Robot in Spot Welding.	K3	CO5	7M
		ii) Define material transfer application? Explain about simple pick and operation with neat sketch	K3	CO5	7M
	OR				
	b	i) Describe the Spray-painting operation with robot system	K3	CO5	7M
ii) Discuss different features of Path planning in Robots & their significance		K3	CO5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EC3201 MICRO WAVE AND OPTICAL COMMUNICATIONS

Time: 3 hours

(ECE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) A silver plated ($\sigma = 6.17 \times 10^7 \text{ Sm}^{-1}$) WR 90 rectangular waveguide ($a=2.286 \text{ cm}$, $b=1.016 \text{ cm}$) filled with PTFE Teflon ($\epsilon_r = 2.1$, $\mu_r = 1$, $\tan\delta = 1.5 \times 10^{-4}$) has to propagate the TE ₁₀ wave at 10 GHz. Determine the attenuation due to conduction and dielectric losses for the wave propagating down the dielectric-loaded waveguide.	K3	CO1	7M
		ii) Derive different field expressions for TM mode existing in Circular Waveguide?	K3	CO1	7M
	OR				
	b	i) A TE ₁₀ wave at 10 GHz propagates in a rectangular waveguide of internal dimensions 2.5 cm × 1.25 cm filled with Teflon having $\epsilon_r = 2.1$. Determine: (a) phase constant, (b) guide wavelength, (c) phase velocity, (d) The wave impedance.	K3	CO1	7M
		ii) Derive different field expressions for TE mode existing in Rectangular Waveguide?	K3	CO1	7M
2	Unit-II				
	a	i) (a) What is the application of a Magic Tee? (b) Find the S-Matrix for a Magic Tee.	K3, k4	CO2	7 (2+5) M
		ii) Discuss with a proper diagram the principle of operation of the Gyrator or phase shifter.	K2	CO2	7M
	OR				
b	i) (a) What are the properties of the S-Matrix? (b) Find the S-matrix for the 2-port linear network and define each S-parameters.	K3, k4	CO2	7(2+5) M	
	ii) Discuss the principle of microwave amplification in a two-cavity Klystron using the Apple-Gate diagram.	K2	CO2	7M	

Unit-III					
3	a	i) Write down the working principle of Gunn diode using two valley model theory.	K2	CO3	7M
		ii) Explain how the high value of VSWR can be measured by twice the minimum method.	K3	CO3	7M
	OR				
	b	i) Write down the working principle of the IMPATT diode as an oscillator.	K2	CO3	7M
ii) Explain with a block diagram how the frequency of an unknown microwave signal can be measured.		K3	CO3	7M	
Unit-IV					
4	a	i) What do you mean by numerical aperture and the acceptance angle of a fiber? Derive expressions for them.	K1, K2	CO4	7M
		ii) (a) What do you mean by V-parameter? Give the expression for the same. (b) Single-mode step-index fiber has a core diameter and numerical aperture as of 3 μm and 0.1, respectively. Calculate the value of the V-parameter when the wavelength of the propagating wave is 0.8 μm .	K1, K2	CO4	7 (3+4) M
	OR				
	b	i) Describe a simple block diagram of an optical fiber transmission link and explain the function of each element in the link.	K4	CO4	7M
ii) Describe the structures of different optical fibers with ray paths. What is the approximate diameter of an optical fiber in each case?		K4	CO4	7M	
Unit-V					
5	a	i) Explain the detection process in a p-i-n photodiode. Compare the device with p-i-n avalanche photodiode.	K2	CO5	7M
		ii) Derive the condition of lasing in terms of gain and loss coefficients per unit length and the reflectivity of mirrors placed at the end facets of the LASER crystal.	K3	CO5	7M
	OR				
	b	i) Explain the detection process in a p-n photodiode. Compare the device with p-i-n photodiode.	K2	CO5	7M
ii) Write a note on the semiconductor Injection laser or explain the working principle of LASER diode.		K2	CO5	7M	

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome

M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EC3202

VLSI DESIGN

Time: 3 hours

(ECE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a) i) Discuss the MOS transistor operation with the help of neat sketches in the Enhancement mode.	2	1	7M
	ii) Derive the required Pull-up to Pull-down Ratio for nMOS inverter driven by another nMOS inverter.	3	1	7M
	OR			
	b) i) Differentiate Enhancement mode and depletion mode transistor actions in MOS transistors.	4	1	7M
	ii) Calculate the shift in the transfer characteristics, for a CMOS inverter, when β_n/β_p ratio is varied from 1/1 to 10/1.	3	1	7M
Unit-II				
2	a) i) Determine the propagation delay in the cascaded pass transistor chain.	2	2	7M
	ii) If n- channel sheet resistance R_{sn} is 102Ω per square and P-channel sheet resistance R_{sp} is $2.5 \times 10\Omega$ per square, $Z_{pu}=4:4$ and $Z_{pd}=2:2$, then evaluate on resistance of an inverter from V_{DD} to GND.	3	2	7M
	OR			
	b) i) Analyze various sources of capacitance which contribute to overall wiring capacitance.	4	2	7M
	iii) A particular layer of MOS circuit has a resistivity $\rho=1\Omega\text{-cm}$. A section of this layer is $55\mu\text{m}$ long and $5\mu\text{m}$ wide and has a thickness of $1\mu\text{m}$. Calculate the resistance from one end of the section to the other using the concept of sheet resistance.	3	2	7M
Unit-III				
3	a) i) Define scaling factor? Explain different types of device parameters.	2	3	7M
	ii) Explain Single stage amplifier with resistive load.	2	3	7M
	OR			
	b) i) Analyse the limitations of scaling MOS circuits.	4	3	7M
	ii) Briefly discuss Single stage amplifier with diode connected load.	2	3	7M
Unit-IV				
4	a) i) Explain in detail about the issues in dynamic CMOS design.	2	4	7M
	ii) Sketch the mask layout for two input CMOS NAND gate	4	4	7M
	OR			
	b) i) Write about CMOS NAND gate with a suitable stick diagram.	4	4	7M
	ii) Sketch the mask layout for a two input CMOS NOR gate	4	4	7M
Unit-V				
5	a) i) Differentiate FinFET and TFET technologies.	4	5	7M
	iii) Justify which high k metal gate device process is better.	4	5	7M
	OR			
	b) i) Explain the FPGA design process.	2	5	7M
	ii) Describe the basic architecture of FPGA.	2	5	7M

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20EC3203 MICROPROCESSOR AND MICRO CONTROLLERS

Time: 3 hours

(ECE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) (a) What is Addressing? (b) What are the addressing mode available in the 8086 microprocessors with example?	K2	CO1	7M
		ii) Draw the block diagram/architecture of 8085 microprocessors. And briefly describe each block.	K4	CO1	7M
	OR				
	b	i) Explain listed below Instructions with Examples in the 8086 microprocessors: MOV, IMUL, XCHG, OUT, PUSHF, STC, JNC	K3	CO1	7 M
		ii) Draw the block diagram/architecture of 8086 microprocessors. And briefly describe each block.	K4	CO1	7M
2	Unit-II				
	a	i) Explain the operation of these 8086 signals: $\overline{BHE}/S7$, $\overline{MN}/\overline{MX}$, \overline{READY} , \overline{NMI} , (S3, S4), \overline{HOLD} , \overline{ALE}	K2	CO2	7M
		ii) Compare the Pentium and 8086 microprocessors in detail.	K4	CO2	7M
	OR				
	b	i) What are the functions of segment register in 8086 microprocessors? What are the functions of general-purpose register?	K2	CO2	7M
		ii) Write the different stages present in the integer and floating-point pipeline of the Pentium. And explain each stage briefly.	K4	CO2	7M
3	Unit-III				
	a	i) (a)Specify handshaking signals and their functions if port A of 8255 is set up as the output port in mode 1. (b) Identify the mode 0 control word to configure port A and port CU as input ports and port B and port CL as output ports.	K4	CO3	7 M
		ii) Explain the block diagram and the functions of each block of the 8255 programmable peripherals device.	K2	CO3	7M
	OR				
	b	i) Explain the block diagram and the functions of each block of the 8251 USART.	K2	CO3	7M
		ii) Explain the process of Direct Memory Access (DMA) and the functions of various elements of the 8257.	K2	CO3	7M
4	Unit-IV				
	a	i) Explain the operation of these 8051 blocks: I/O port registers, PCON, Interrupt control registers.	K4	CO4	7M
		ii) (a) Define interrupt priority. (b) Write the vector addresses and the priority sequence of the 8051 interrupts.	K2	CO4	7M
	OR				
	b	i) Explain the operation of these 8051 pins: PSEN, ALE, (T0, T1), (XTAL1, XTAL2), TXD/P3.1, RXD/P3.0, RST	K2	CO4	7M
		ii) Explain listed below Instructions with Examples in the 8051 microcontrollers: RR, SJMP, ANL, MOVX, DIV, DAA, JNC	K3	CO4	7M

Unit-V					
5	a	i) Explain the interfacing of push button switches and LEDs with the 8051 microcontrollers.	K2	CO5	7M
		ii) Assume that an ADC and a DAC chip are interfaced with the 8051. Write a program to read the data from the ADC and output it on the DAC line with a 1ms delay.	K3	CO5	7M
	OR				
	b	i) Explain the interfacing of seven segment display with the 8051 microcontrollers.	K2	CO5	7M
ii) Describe with a schematic, the scanning of the matrix keyboard in an 8051-based system and identifying the key pressed.		K3	CO5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks***

III B.Tech II Semester Regular Examinations, April-2023

Sub Code:R20EC3207

DIGITAL IMAGE PROCESSING

Time: 3 hours

(ECE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a i) Explain the following terms: (i) Adjacency (ii) Connectivity (iii) Regions (iv) Boundaries	K4	1	7M
	ii) What is the need of image transform? List out various transform used in image processing	K4	1	7M
	OR			
	b i) Apply Discrete Cosine Transform (DCT) For 2-D Image.	K3	1	7M
	ii) Prove that both the 2-D continuous and discrete Fourier transforms are linear operations	K4	1	7M
Unit-II				
2	a i) Illustrate the concept of Image negatives and Log transformation functions for Intensity transformation.	K2	2	7M
	ii) What is an adaptive median filter? Explain its use for noise reduction in an image.	K3	2	7M
	OR			
	b i) With an example, explain the concept of image reconstruction from back projections.	K4	2	7M
	ii) Explain about image restoration using minimum mean square error filtering.	K3	2	7M
Unit-III				
3	a i) Explain the procedure of converting colors from RGB to HIS.	K4	3	7M
	ii) What is color image smoothing? Explain how smoothing will be done by neighborhood averaging	K4	3	7M
OR				
	b i) Examine pseudo color image processing	K4	3	7M
	ii) Explain image sharpening using Butterworth high pass and Gaussian high pass filters.	K4	3	7M
Unit-IV				
4	a i) What are the various Multi resolution analysis requirements? Explain.	K4	4	7M

		ii) b) What is Haar Transform? Write the procedure to determine the Haar transformation matrix.	K4	4	7M
	OR				
	b	i) Explain the concept of wavelet packets and write its advantages.	K4	4	7M
		ii) Draw the block diagram of lossless predictive coding model and explain it.	K4	4	7M
	Unit-V				
5	a	i) Explain the following morphological operations: (i) Erosion (ii) Dilation	K3	5	7M
		ii) Explain about morphological hit-or-miss transform	K4	5	7M
	OR				
	b	i) Explain the following morphological algorithms i) Boundary extraction ii) Hole filling	K3	5	7M
		ii) Discuss about opening and closing for gray scale images.	K4	5	7M

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20CSHN04

AGILE WITH SCRUM

Time: 3 hours

(CSE)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Elaborate the history of Agile Methodology	2	1	7M
		ii) How Agile Project Management Philosophy differ from Traditional Project Management? Describe.	3	1	7M
	OR				
	b	i) Discuss in detail about the Principles of Agile Methodology	2	1	7M
	ii) List out the agile frame work. Explain in detail about Kanban.	2	1	7M	
Unit-II					
2	a	i) How does Scrum work? Explain with a neat diagram	3	2	7M
		ii) How is Scrum different from Agile ? Compare Agile vs. scrum.	3	2	7M
	OR				
	b	i) Illustrate in detail about the Scrum Methodology and Process.	3	2	7M
	ii) Discuss about Agile Project Management Tools.	2	2	7M	
Unit-III					
3	a	i) Discuss about the Agile Test Plan and the Strategies	2	3	7M
		ii) How TDD fits into Agile development? Illustrate.	3	3	7M
	OR				
	b	i) What is Test Driven Development? Discuss about the Benefits of Test Driven Development (TDD).	2	3	7M
	ii) Discuss about the Agile Process , Life Cycle and testing tools.	2	3	7M	
Unit-IV					
4	a	i)How does manage the software design problems with SOLID principles? Explain with an example	3	4	7M
		ii) How does SRP gives a good way to identify the classes at the design phase of an application? Discuss with an example.	3	4	7M
	OR				
	b	i)Justify the following principle with a case study, "A software module/class is open for extension and closed for modification"	3	4	7M
	ii) How LSP differ from Open Closed Principles? Explain	3	4	7M	
Unit-V					
5	a	i)How to implement agile marketing methodology? Explain step by step process.	3	5	7M
		ii) What is agile Marketing? How does agile marketing work?	3	5	7M
	OR				
	b	i)Discuss in detail about the History of agile marketing.	2	5	7M
	ii) Summarize the Seven agile marketing techniques to deliver projects effectively	2	5	7M	

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20AI3204

DEEP LEARNING

Time: 3 hours

CSE (AI)

Max. Marks: 70

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M			
Unit-I							
1	a	i) Explain how estimation can be done using Bayesian Statistics?			2	1	7M
		ii) Discuss about overfitting and underfitting with an example.			2	1	7M
	OR						
	b	i) Define Stochastic Gradient Descent algorithm with an example.			2	1	7M
ii) Discuss about Estimators, Bias and Variance with example.			2	1	7M		
Unit-II							
2	a	i) Discuss in brief about Dataset Augmentation, Semi-Supervised Learning, Multitask Learning.			2	2	7M
		ii) Explain about back-propagation with an example.			2	2	7M
	OR						
	b	i) Define noise robustness with an example.			2	2	7M
ii) What is regularization? How is it applied in deep learning?			2	2	7M		
Unit-III							
3	a	i) Distinguish between optimization strategies and Meta-algorithms.			2	3	7M
		ii) Explain about Approximate Second-Order Methods.			2	3	7M
	OR						
	b	i) Discuss how learning algorithms differ from pure optimization.			2	3	7M
ii) Discuss about the challenges in Neural Network Optimization.			2	3	7M		
Unit-IV							
4	a	i) Define pooling. How is it useful?			2	4	7M
		ii) Discuss about the neuroscientific basis for Convolutional Networks			2	4	7M
	OR						
	b	i) What are unsupervised features. Give an example.			2	4	7M
ii) Discuss in brief the working of convolutional neural networks.			2	4	7M		
Unit-V							
5	a	i) Explain the working of recurrent neural networks in detail			2	5	14M
	OR						
	b	i) Distinguish between recursive and recurrent neural networks.			2	5	7M
ii) What is a Bidirectional RNN? How is it different from RNN?			2	5	7M		

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20AIHN04

SPEECH PROCESSING

Time: 3 hours

(AI)

Max. Marks: 70

Note: Answer All FIVE Questions.
 All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
Unit-I					
1	a	i) Summarize various Models and Algorithms used in language processing?	2	1	7M
		ii) Define Regular Expression? Explain how regular expressions are useful for characterizing text sequences?	2	1	7M
	OR				
	b	i) Define N-gram? Illustrate how a bigram model is useful to predict the probability of next word with suitable example?	2	1	7M
		ii) Define Morphological Parsing? Explain its significance in speech and language processing?	2	1	7M
	Unit-II				
2	a	i) Discuss briefly about various algorithms used for part-of-speech tagging?	2	2	7M
		ii) Illustrate with an example, how a Markov chain is used for assigning probability to sequence of weather events?	2	2	7M
	OR				
	b	i) List and describe the components of HMM? Illustrate sample HMM for Ice cream task?	2	2	7M
		ii) Explain the significance of MaxEnt Model with your own sample scenario?	3	2	7M
	Unit-III				
3	a	i) List and explain various factors that influence Phonetic Variation?	2	3	7M
		ii) Explain the functionality of Source-Filter Model?	2	3	7M
	OR				
	b	i) Discuss briefly about Phonetic Resources?	1	3	7M
		ii) Write short notes on Acoustic Phonetics?	2	3	7M
	Unit-IV				
4	a	i) Illustrate the steps involved in text normalization?	2	4	7M
		ii) List and explain various metrics and tests used for evaluating speech synthesis systems?	2	4	7M
	OR				
	b	i) What do you mean by unit selection synthesis? How Unit selection synthesis is different from classic diphone synthesis?	3	4	7M
		ii) Write short notes on Phonetic Analysis?	2	4	7M
	Unit-V				
5	a	i) Illustrate the architecture of HMM-based speech recognition system with neat sketch?	2	5	7M
		ii) Determine the steps involved in feature extraction using MFCC vectors?	3	5	7M
	OR				
	b	i) Define Vector Quantization (VQ)? Draw and explain schematic architecture of VQ process?	2	5	7M
		ii) Explain the functionality of A*('Stack') Decoding Algorithm?	2	5	7M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, Month/Year

Sub Code: R20AI3206

NATURAL LANGUAGE PROCESSING

Time: 3 hours

CSE (AI)

Max. Marks: 70

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M	
1	Unit-I				
	a	i) What is NLP? List and explain applications of NLP.	K2	CO1	7M
		ii) Explain phases of NLP.	K2	CO1	7M
	OR				
	b	i) Explain Spelling error and Noisy Channel Model	K2	CO1	7M
		ii) Describe difficulty of NLP including ambiguity	K2	CO1	7M
2	Unit-II				
	a	i) Differentiate extrinsic evaluation and intrinsic evaluation.	K2	CO2	7M
		ii) Explain how perplexity metric can be used for evaluating language models.	K2	CO2	7M
	OR				
b	Explain Neural Language Model, Case study: application of neural language model in NLP system development.	K2	CO2	14M	
3	Unit-III				
	a	i) What is POS tagging? Explain rule based tagger.	K4	CO3	7M
		ii) Explain POS tagging using neural model	K4	CO3	7M
	OR				
	b	i) What do you mean by parts of speech tagging? What is the need of this task in NLP.	K4	CO3	7M
ii) Explain POS tagging using HMM.		K4	CO3	7M	
4	Unit-IV				
	a	i) Differentiate between top down and bottom up parsing.	K4	CO4	7M
		ii) Explain syntactic CKY parsing algorithm.	K4	CO4	7M
	OR				
b	i) Explain tree bank with suitable example.	K4	CO4	7M	
	ii) Illustrate Probabilistic Context Free Grammar.	K4	CO4	7M	
5	Unit-V				
	a	Explain Semantics Vector Semantics; Words and Vector.	K4	CO5	14M
OR					
b	Why do we need word embedding. Explain Continuous Bag of Words Model (CBOW) and Skip-gram	K4	CO5	14M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20IT3202

AGILE METHODOLOGIES

Time: 3 hours

(IT)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a	i) Compare and contrast in between traditional and agile software development processes?		
		2	1	7M
		ii) Explain the classification of different agile methods?		
		2	1	7M
OR				
b	i) Explain design and testing processes in agile?			
		2	1	7M
				ii) What are different agile principles? Explain its's Manifesto?
		2	1	7M
Unit-II				
2	a	i) Explain Feature driven development and adaptive software development?		
		2	2	7M
		ii) Explain Roles and practices of agile process?		
		2	2	7M
OR				
b	i) Explain the Lean production of SCRUM and crystal techniques?			
		2	2	7M
				ii) Analyze Extreme programming method overview and life cycle?
		4	2	7M
Unit-III				
3	a	i) What is a story card? Explain its role and maturity model(SMM)?		
		2	3	7M
		ii) Describe about Agile information Systems?		
		2	3	7M
OR				
b	i) Explain about Knowledge management(KM) in software engineering?			
		2	3	7M
				ii) Explain about institutional knowledge evolution cycle?
		2	3	7M
Unit-IV				
4	a	i) Explain the management of unstable requirements and elicitation process using agile?		
		2	4	7M
		ii) Analyze the process of concurrency in agile requirements generation?		
		4	4	7M
OR				
b	i) Explain the agile requirements abstraction model?			
		2	4	7M
				ii) Explain the modeling and generation process of agile requirements?
		2	4	7M
Unit-V				
5	a	i) Explain various Feature driven development(FDD) Agile Metrics?		
		2	5	7M
		ii) Explain the quality assurance approach in agile?		
		2	5	7M
OR				
b	i) Analyze the impact of agile in global software development?			
		4	5	7M
				ii) explain the process of test driven development?
		2	5	7M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome M: Marks

III B.Tech II Semester Regular Examinations, April-2023

Sub Code: R20ITHN03
ARTIFICIAL INTELLIGENCE

Time: 3 hours

(IT)

Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No	Questions	KL	CO	M
Unit-I				
1	a	i) Define Artificial Intelligence? Outline the applications of AI in various domains?		7M
		ii) List and explain the issues involved in the design of search programs?		7M
	OR			
	b	i) Define State Space Search? Illustrate State Space representation of Tic-Tac-Toe problem?		7M
	ii) Describe the elements and characteristics of Production System in AI?		7M	
Unit-II				
2	a	i) Illustrate the steps involved in solving Cryptarithmic puzzle SEND + MORE = MONEY using CSP?		7M
		ii) Describe how computable functions and predicates are useful in representing the knowledge with your own examples?		7M
	OR			
	b	i) List and explain the features of Hill Climbing Algorithm. Outline the regions in which Hill Climbing algorithm cannot attain optimal solution?		7M
	ii) Determine the predicate logic for the following statements:		7M	
	a) Marcus is Man.			
	b) Marcus was a Pompeian.			
	c) Every Farmer likes Sun.			
	d) Everyone is loyal to someone.			
Unit-III				
3	a	i) Differentiate between Forward and Backward Chaining?		7M
		ii) Summarize the necessity of Semantic Net. Construct semantic net representation for the following:		7M
		A) Pompeian(Marcus), Blacksmith(Marcus)		
		B) Mary gave yellow flowered vase to her best friend.		
OR				
	b	i) Define Frame? Describe knowledge representation using frames?		7M
		ii) Explain various matching proposals suggested for successful rule-based system?		7M
Unit-IV				
4	a	i) Describe the process of Rote Learning? Mention its Pros and Cons?		7M
		ii) Define Reinforcement Learning? Write and explain Q-Learning Algorithm?		7M
	OR			
	b	i) Explain the process of Temporal Difference Learning? List few applications and the challenges associated with Temporal Difference Learning?		7M
	ii) Describe how a Mostow's program named "FOO" plays card game by using advice based learning?		7M	

Unit-V					
5	a	i) Describe the various steps involved in Natural Language Processing?	2	5	7M
		ii) Explain how spell checking is implemented using NLP?	2	5	7M
	OR				
	b	i) Summarize the significance of Statistical NLP? Discuss about few Statistical models used in NLP?	2	5	7M
ii) Discuss various applications of NLP?		2	5	7M	

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks
