H.T No: | | | | | | | | | | | **R18** | **Course Code: A30558**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Data Visualization

(Computer Science & Engineering)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is the role of cognition in the visualization process?	2 M
2.	How to use the pseudocode conventions in visualization?	2 M
3.	Discuss techniques for visualizing two-dimensional spatial data.	2 M
4.	What are the advantages of visualizing dynamic spatial information?	2 M
5.	Define visualizing Time Oriented data.	2 M
6.	Define multivariate data. List out various techniques for visualizing multivariate data.	2 M
7.	What are the factors influenced to visualize node linked diagram?	2 M
8.	Explore the challenges in displaying hierarchical structures in trees.	2 M
9.	Discuss common problems in designing effective visualizations.	2 M
10.	Explore different types of visualization systems based on data type.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Discuss the history of visualization and its evolution over time. Analyze the significance of visualization in various fields.	10M
	OR	
11. B).	Explore the relationship between visualization and other fields, emphasizing its interdisciplinary nature. Discuss how visualization techniques have been applied in different domains.	10M
12. A).	Discuss the challenges and advantages of visualizing three-dimensional spatial data. Provide examples to illustrate effective visualization techniques for three-dimensional data.	10M
	OR	
12. B).	Discuss visualization techniques for Geospatial data in detail.	10M
13. A).	Discuss visualization techniques for time-oriented data. Explore the challenges and considerations in visualizing time-oriented information.	10M
	OR	
13. B).	Explore combinations of techniques for visualizing multivariate data. Discuss how combining techniques can provide a comprehensive understanding of complex data sets.	10M

(P.T.O..)

14. A). Discuss text and document visualization, emphasizing the levels of text representations. Explain the Vector Space Model in the context of text visualization. 10M

OR

14. B). Explore challenges in displaying arbitrary graphs and networks. Discuss strategies for effective visualization of arbitrary and complex network structures. 10M

15. A). Outline the steps involved in designing effective visualizations. Discuss how a systematic design approach contributes to the success of visualizations. 10M

OR

15. B). Discuss the role of visualization in modern integrated visualization systems. Explore the significance of toolkits and libraries in developing effective visualization tools. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30532**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Software Project Management

(Common for CSE & IT)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What is late risk resolution? 2 M
2. What are the various cost estimation models? 2 M
3. List the different phases of life cycle process. 2 M
4. What are the different software process workflows? 2 M
5. Write the typical release description outline. 2 M
6. Define product release milestone. 2 M
7. Who are the stakeholders? List them. 2 M
8. What is roundtrip engineering? 2 M
9. Define rework and adaptability. 2 M
10. What are the major components of software cost? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). With a neat diagram explain the process profile of a conventional software project. 10M

OR

11. B). What are the important trends in improving software economics? Explain clearly any two of them. 10M

12. A). What is meant by software project architecture? Discuss the architecture in management perspective. 10M

OR

12. B). Compare the engineering artifacts with management artifacts and programmatic artifacts. 10M

13. A). Write about the conventional work breakdown structure. Justify the conventional WBS is project specific and cross project comparisons are usually difficult or impossible. 10M

OR

13. B). Distinguish between major milestones and minor milestones of a process. 10M

14. A). Explain in detail about the change management and its automation in the modern life cycle process. 10M

OR

14. B). Explain in detail about the organization policy and environment. 10M

15. A). Demonstrate various management indicators for assessing a project. 10M

OR

15. B). Discuss the following in case of CCPDS-R project. 10M

i) Software acquisition process.

ii) Overview of the common subsystem products.

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H.T No: | | | | | | | | | | | R18 | Course Code: A36213

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Digital Forensics

(CSC)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. Name the tools used in conducting a forensic analysis of a digital device. 2 M
2. What is digital evidence, and how is it different from other types of evidence? 2 M
3. List the steps involved in retrieving electronic evidence from a crime scene. 2 M
4. Extend the importance of maintaining a chain of custody when collecting electronic evidence. 2 M
5. Define probable cause in evidence management and presentation. 2 M
6. Can operating system permissions affect evidence management? Relate. 2 M
7. Recall the process of conducting a computer forensics investigation. 2 M
8. Interpret the requirements for preserving network data during a network forensic analysis. 2 M
9. Name some mobile forensics tools that can be used for evidence collection and analysis. 2 M
10. Outline the process for searching and seizing electronic evidence in a mobile forensics investigation. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Identify the specific role of criminalistics in the investigation of computer crime. 5M
ii) Dissect the challenges investigators face when dealing with cyber-criminalistics. 5M

OR

11. B). i) Summarize the role of data acquisition in digital forensics investigations. 5M
ii) Assess how investigators can ensure the integrity of the data they collect. 5M

12. A). i) Examine the importance of conducting a thorough electronic evidence search and seizure. 5M
ii) Perceive the methods investigators can use to collect all relevant evidence. 5M

OR

12. B). Discuss the various types of electronic evidence used in a criminal investigation and explain how investigators can use them to authenticate this evidence. 10M

13. A). i) Develop a process of creating and managing shared folders using an operating system. 5M
ii) Inspect the importance of maintaining proper access controls to ensure the security of the shared data. 5M

OR

13. B). Discuss the challenges of managing and presenting electronic evidence in a court of law and explain how investigators can overcome these challenges to ensure a successful prosecution. 10M

(P.T.O..)

14. A). i) Describe the steps involved in preparing a case for a computer forensics investigation. 5M
ii) Explain the importance of establishing clear goals and objectives for the investigation. 5M

OR

14. B). Discuss the steps in conducting a computer forensics investigation and explain how investigators can collect, preserve, and analyze digital evidence. 10M

15. A). Explain how mobile forensics investigations differ from other digital forensics investigations and write about different mobile forensic tools. 10M

OR

15. B). Recommend the recent trends in mobile forensic techniques, including new tools and methodologies used to acquire, analyze, and interpret mobile device data. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A36610**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Internet Technologies

(AIM)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Explain the purpose of the $ symbol in PHP with an example. 2 M
2. Show the code that connect PHP to the database. 2 M
3. Build your list with combination of Ordered list and Un Ordered list. 2 M
4. Define DOM. What purpose does it serve? 2 M
5. Explain the different types of session tracking mechanism supported by Servlets? 2 M
6. Explain about Common Gateway Interface. 2 M
7. Illustrate the Script Tag with an example. 2 M
8. Compare and contrast JSP and Servlet. 2 M
9. Write a Java Script code to handle any one event. 2 M
10. Write a Java script code that uses an alert box to display a notification that the provided user name is incorrect. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Demonstrate how to use a PHP script to upload a file to a server and display the details of the file. 10M

OR

11. B). Compare between Get and Post methods in PHP form submitting. 10M

12. A). Define Frameset, Frame Tag, demonstrate to divide the web page into four equal parts and each individual part displays different web page. 10M

OR

12. B). Experiment Internal and External DTD's with an example. 10M

13. A). Demonstrate the usage of Cookies in Servlets with an example. 10M

OR

13. B). Illustrate JDBC connection to a database with an example. 10M

14. A). Develop an example about the JSP each directive Elements. 10M

OR

14. B). Illustrate MVC architecture with an example. 10M

(P.T.O..)

15. A). Write a java script code to perform the following validation for the form : 10M

Check for empty field: Has the user left required field empty. If the field is empty return alert message.

Check for numbers: User entered number in the contact field

Check for alphabet: Has the user entered characters in alphabets in name field.

Check for numbers and letters: If a text input is all alpha numeric in the message field

Check for characters: Has the user is entered correct length for the user name field.

OR

15. B). Illustrate an example of the Java Script form validation. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30529

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Software Testing Methodologies

(CSD)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	State pesticide paradox and complexity barrier in purpose of testing?	2 M
2.	Explain about test design and different types of testing?	2 M
3.	Differentiate between function and structure testing	2 M
4.	Explain the terms dicing, data flow and debugging	2 M
5.	Define nice and ugly domains.	2 M
6.	Discuss the advantages and disadvantages of path selection in transaction flow	2 M
7.	Define the bug assumptions for domain testing	2 M
8.	Define path expression and path product	2 M
9.	Define the operators of Boolean algebra	2 M
10.	Define transitions and discuss unreachable states	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain goals for testing and model for testing in software testing.	10M
	OR	
11. B).	Explain the factors on which the importance of the bugs depend and give the metrics for them.	10M
12. A).	Discuss the following strategies of data flow testing with suitable examples: i) All-Predicate-Uses (APU) strategy ii) All-Computational (ACU) strategy	10M
	OR	
12. B).	Define transaction flow structure. Discuss the reasons that the transaction flows are often structured.	10M
13. A).	Define domains and paths. Explain domains and testability tips.	10M
	OR	
13. B).	Explain about: i) Interior point ii) Boundary point iii) Extreme point iv) Cross term-step	10M

(P.T.O..)

14. A). Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra: 10M

i) Associative laws

ii) Demorgan's theorems for three variables.

OR

14. B). Discuss in detail about state graphs, good and bad state graphs and state testing. 10M

15. A). Discuss in detail about Graph matrices and its applications. 10M

OR

15. B). Demonstrate the steps involved in node reduction procedure. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30534**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Design Patterns

(Common for CSD & AID)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define the Design Patterns and mention its advantages. 2 M
2. How to select a design pattern? 2 M
3. Write about document structure. 2 M
4. State the role of recursive composition. 2 M
5. How many objects is the Singleton responsible for creating? 2 M
6. What problem does the Builder pattern solve in software design? 2 M
7. What are all the Participants for Proxy Pattern? 2 M
8. What is the basic problem being solved by the Bridge pattern? 2 M
9. What problem does the Command pattern solve in software development? 2 M
10. Write about Applicability of State Pattern. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Discuss the role of design patterns in Smalltalk MVC. 5M
ii) Draw a diagram to describe design pattern relationships. 5M

OR

11. B). i) What are the different ways in which patterns and frameworks share similarities. 5M
ii) Describe the consistent format for describing the design patterns. 5M

12. A). Discuss about Lexi's user interface and its design problems. 10M

OR

12. B). Discuss about toolkits and frameworks. 10M

13. A). Discuss the Motivation, Structure, Collaborations and Implementation of the following Patterns: i) Abstract Factory ii) Prototype 10M

OR

13. B). i) What are the implementation issues of prototype design pattern? Discuss. 5M
ii) Can we use an abstract factory for supporting multiple window system in Lexi's design. 5M

14. A). Design and Discuss the Intent, Applicability, Sample code, and Known uses of the following patterns. a) Adapter b) Flyweight. 10M

OR

14. B). i) Discuss in detail the participants and consequences of Composite pattern. 5M
ii) What is the intent and motivation of Façade pattern? Explain. 5M

(P.T.O..)

15. A). i) Write about the implementation issues of memento pattern. 5M

ii) Explain the motivation and applicability of observer pattern. 5M

OR

15. B). What is Command Pattern? Describe in detail about structure, participants and collaborations of Command pattern. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A37202**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular Examinations Jun/ July-2024

Course Name: Pattern Recognition

(AID)

Date: 02.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is meant by Pattern Recognition?	2 M
2.	Name different paradigms for Pattern Recognition.	2 M
3.	Outline any two variants of the Nearest Neighbor Algorithm.	2 M
4.	What is the Bayes Theorem?	2 M
5.	Infer any two models that can be used for Classification.	2 M
6.	What is meant by Pruning?	2 M
7.	What is the primary goal of Support Vector Machines (SVM) in classification?	2 M
8.	Which methods are used for combining classifiers?	2 M
9.	What is meant by Clustering?	2 M
10.	Why is clustering important in pattern recognition?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Recall the various paradigms of pattern recognition and their applications in real-world scenarios.	10M
	OR	
11. B).	Find the importance of feature extraction and feature selection in the pattern recognition process.	10M
12. A).	Compare and contrast the nearest neighbor classifier with the naive Bayes classifier and the Bayesian belief network, focusing on their underlying principles, computational efficiency, and accuracy.	10M
	OR	
12. B).	Demonstrate the role of the Bayes Theorem in pattern recognition and how it is applied in the development of minimum error rate classifiers.	10M
13. A).	Explain the principles of Hidden Markov Models and their application in classification tasks. Also, provide examples of real-world problems where HMMs have been successfully applied.	10M
	OR	
13. B).	Analyze the strengths and weaknesses of decision trees compared to other classification techniques, such as support vector machines and neural networks.	10M

(P.T.O..)

14. A). Discuss the role of neural networks in enhancing the performance of support vector machines. Provide examples of applications where this combination has proven beneficial. 10M

OR

14. B). Identify the advantages and challenges of using ensemble methods in pattern recognition. 10M

15. A). Analyze the importance of clustering in pattern recognition and data analysis. Discuss how hierarchical and partitional clustering algorithms differ. 10M

OR

15. B). Examine the challenges and solutions in clustering large datasets. Discuss the preprocessing steps required for handling such data and the evaluation of clustering results. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30143**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Prestressed Concrete

(Civil Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What are the types of prestressing systems? 2 M
2. What do you understand about pre tensioning system? 2 M
3. Write about elastic deformation loss in prestress. 2 M
4. How do you estimate the loss due to elastic shortening in PSC beams? 2 M
5. Discuss briefly the modes of failure due to shear. 2 M
6. Explain the ways by which shear resistance of structural concrete members can be improved. 2 M
7. What are the various methods used for investigating anchorage zone stresses? 2 M
8. What do you understand about term Transfer? 2 M
9. Write the factors influencing deflection. 2 M
10. Differentiate between short term and long term deflection. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). An unsymmetrical I-Section is used to support an imposed load of 2 kN/m over a span of 8 m. The sectional details are top flange 300 mm wide and 60 mm thick; bottom flange 100 mm wide and 60 mm thick; thickness of web = 80 mm overall depth of beam = 400 mm at centre of span, the effective prestressing force of 100 kN is located at 50 mm from the soffit of beam. Estimate the stresses at centre of span section of beam for the following load conditions (a) Pre-stress + Self Wt (b) pre-stress + Self Wt+ live load. 10M

OR

11. B). Discuss about any two types of Post tensioning anchorage systems with neat sketch. 10M

12. A). A post-tensioned beam 200 mm wide and 300 mm deep is pre-stressed with wires of area = 320 mm^2 initially stressed to 1000 N/mm^2 with their centroids located 100 mm from the soffit. Estimate the final percentage loss of stress due to creep, shrinkage and relaxation using the following data: Relaxation of steel stress = 5 percent of the initial stress; $E_s = 210$ kN/mm^2; $E_c = 35$ kN/mm^2; 10M

OR

12. B). A pretensioned concrete beam of rectangular cross-section, 150 mm wide and 300 mm deep is prestressed by eight high tensile wires of 7 mm diameter located at 100 mm from the soffit of the beam. If the wires are tensioned to a stress of 1100 N/mm^2, Calculate the percentage loss of stress due to elastic deformation assuming the modulus of elasticity of concrete and steel as 31.5 and steel as 210 kN/mm^2. 10M

(P.T.O..)

13. A). Explain the various modes of failure encountered in prestressed concrete beams subjected to bending, shear and torsion. 10M

OR

13. B). A post-tensioned prestressed concrete Tee beam having a flange width of 1200 mm and flange thickness of 200 mm thickness of web being 300mm is prestressed by 2000 mm^2 of high tensile steel located at an effective depth of 1600mm. if f_{ck}= 40 N/mm^2 and f_p=1600 N/mm^2, estimate the ultimate flexural strength of the unbounded tee section assuming span/depth ratio as 20 and f_{pe}=1000 N/mm^2. 10M

14. A). Estimate the transmission length at the ends of a pretensioned beam prestressed by 7-mm diameter wires. Assume the cube strength of concrete at transfer as 42 N/mm^2. 10M

OR

14. B). A pretensioned beam is prestressed using 5 mm diameter wires with an initial stress of 80 percent of the ultimate tensile strength of steel (f_{pu} = 1600 N/mm^2). The cube strength of concrete at transfer is 30 N/mm^2. (i) Calculate the transmission length (ii) compute the bond stress at ¼ and ½ the transmission length from the end and (iii) Calculate the overall average bond stress. 10M

15. A). What are the factors influencing the short term and long term deflection? 10M

OR

15. B). A concrete beam having a rectangular section of 100mm wide, and 300 mm deep is prestressed by a parabolic cable carrying an initial force of 240 kN. The cable has an eccentricity of 50 mm at the center of the span and is concentric at the supports. If the span of the beam is 10 m and the live load is 2 kN/m, estimate the short time deflection at the center of the span. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30235

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Non Conventional Energy Sources

(Electrical & Electronics Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Differentiate terrestrial and extra-terrestrial solar radiation.	2 M
2.	What are the advantages of concentrating collectors?	2 M
3.	Define tip speed ratio.	2 M
4.	List out three differences between horizontal and vertical axis wind turbine.	2 M
5.	What are the factors that affect the generation of biogas?	2 M
6.	What is the main advantage and disadvantage of biomass energy?	2 M
7.	What do you understand by geothermal energy?	2 M
8.	What are the main advantages and disadvantages of ocean wave energy?	2 M
9.	What are the limitations of Carnot cycle in DEC?	2 M
10.	What is a fuel cell?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the depletion process of solar radiation as it passes through the atmosphere to reach the surface of the earth.	10M
	OR	
11. B).	Enumerate different types of concentrating collectors and explain the working of any one type of concentrating collector.	10M
12. A).	Explain in details about the various components present in the HAWT with neat sketch.	10M
	OR	
12. B).	What are factors to be considered while selecting wind power generation?	10M
13. A).	Differentiate between the following processes of biomass conversion in detail. i) Pyrolysis, and ii) Anaerobic Digestion.	10M
	OR	
13. B).	Explain the KVIC model of Bio gas plant with neat sketch.	10M
14. A).	What is geothermal energy? Explain the working principle of a geothermal power plant with the help of a neat sketch.	10M
	OR	
14. B).	Explain the principle of operation of open cycle OTEC system.	10M

(P.T.O..)

15. A). What is DEC? Explain with neat diagram how the PV cell convert the photo energy into electricity. 10M

OR

15. B). Explain the need of direct energy conversion system and analyze the advantages of direct energy conversion system over an indirect energy conversion system. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30372**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Automobile Engineering

(Mechanical Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1.	How do you Classify the automobile engines?	2 M
2.	Define the terms Chassis, Frame & Body.	2 M
3.	State the advantages of electronic ignition system using contact breaker.	2 M
4.	List the methods controlling smoke from diesel engine.	2 M
5.	What are the various components in transmission system?	2 M
6.	State the requirements of an automotive clutch.	2 M
7.	What is the function of a braking system?	2 M
8.	Mention the benefits of anti-lock brake system.	2 M
9.	State the advantages of alcohol as fuels in automobiles.	2 M
10.	Mention the types of fuel cell.	2 M

PART-B
Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	With neat diagram explain components and drive system in an automobile chassis.	10M
	OR	
11. B).	What is the necessity of a gear box at all in the automobile when the engine speed can be varied by means of accelerator? Explain with neat sketch.	10M
12. A).	Illustrate with a sketch the working of a three-way catalytic converter system.	10M
	OR	
12. B).	What is the Common Rail Direct Ignition (CRDI) system? Explain with a suitable sketch. What are the advantages and disadvantages of CRDI?	10M
13. A).	With the help of a neat sketch, explain the construction and operation of a sliding mesh gearbox.	10M
	OR	
13. B).	Explain the construction and working principle of propeller shaft with a neat diagram.	10M
14. A).	Discuss a steering linkage for a vehicle with independent suspension with a neat diagram.	10M
	OR	
14. B).	Briefly describe constructional and working details of hydraulic brakes with a neat diagram.	10M
15. A).	What is gasohol? What are the modifications needed in the engine and fuel supply system? And write its advantages and disadvantages?	10M
	OR	
15. B).	Write short notes about Hybrid vehicle and write its principle and mention the main components of a hybrid transmission?	10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30443**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Digital Image Processing

(Electronics & Communication Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What is the storage requirement of a 1024 x1024, 8-level grey scale image? 2 M
2. Define neighbors of an image? 2 M
3. Mention the types of non-linear grey level transformations in image enhancement. 2 M
4. What is the difference between high pass filter and high pass emphasis filter? 2 M
5. When will a constrained least squared filter becomes inverse filter? 2 M
6. Write the different causes of image degradation. 2 M
7. What is the role of first and second derivatives in image segmentation? 2 M
8. Give the masks for dilation and erosion operators in image morphology. 2 M
9. Define spatial and temporal redundancies. 2 M
10. Define JPEG 2000 standard. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Briefly explain the components used in image processing system. 5M

ii) Let V= {0,1}. Compute the D_e, D_4 and D_8 distance between the two pixels p and q. Let the pixel coordinates of p and q are (3,0) and (2,3) respectively. 5M

OR

11. B). i) State and prove the separability and scaling property of 2D-DFT. 6M

ii) Obtain the Haar matrix for N=2. 4M

12. A). i) What is meant by histogram manipulation? 3M

ii) Perform the histogram manipulation of the image 7M

$$F(x, y) = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

OR

12. B). Explain about ideal, Butterworth and Gaussian high pass filtering in frequency domain image segmentation. 10M

13. A). Derive the transfer function of restored image with inverse filtering in image restoration. Mention its advantages and disadvantages. 10M

OR

13. B). Explain constrained least square filter in image restoration. 10M

(P.T.O..)

14. A). i) Classify the image segmentation based on similarities and discontinuities in gray level. 4M
ii) Explain isolated point and line detection in image segmentation with masks. 6M

OR

14. B). Explain the opening and closing of morphological operations with examples. 10M

15. A). i) What is meant by subjective and objective fidelity criteria in image compression. 5M
ii) Explain block transform coding with neat sketch. 5M

OR

15. B). A source emits four symbols {a, b, c, d} with the probabilities {0.4,0.2,0.1,0.3}. Construct arithmetic coding and decode the word 'BAD'. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30516**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Operating System

(Electronics & Communication Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Differentiate between Multi programming and Uni programming.	2 M
2.	Differentiate between Real Time systems and Distributed systems.	2 M
3.	Write briefly about critical section problem.	2 M
4.	Write the characterization of Dead Locks.	2 M
5.	Differentiate between Paging and Thrashing.	2 M
6.	What is mean by Code signing?	2 M
7.	Write briefly about operations on Files.	2 M
8.	Write about Access Matrix Concept.	2 M
9.	Write briefly about Directory structure.	2 M
10.	Write briefly about File Operations.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Discuss about Operating system services and Structures and objectives in detail with examples.	10M
	OR	
11. B).	i) Discuss the major elements of an operating system for multiprogramming.	5M
	ii) Explain in detail about Operating system hierarchy.	5M
12. A).	Discuss in detail about various process scheduling Algorithms with examples.	10M
	OR	
12. B).	Discuss in detail about Inter Process Communication and also write about System call interface for process management.	10M
13. A).	i) What is Process Synchronization and Write the Classical Problems of Synchronization.	5M
	ii) What is Dining Philosophers Problem and Discuss the solution to Dining philosophers' problem using Semaphores.	5M
	OR	
13. B).	i) Write in detail on recovery from the Dead Locks.	5M
	ii) Discuss about Banker's Algorithm for Dead lock prevention.	5M
14. A).	i) What is Virtual Memory and Explain the Demand Paging and its Performance?	5M
	ii) Differentiate between Logical and Physical Address Space with examples.	5M
	OR	
14. B).	Discuss about various Page Replacement Techniques.	10M
15. A).	i) Explain about Two-Level and Three Level Structured Directory.	5M
	ii) Discuss about File access Methods in detail.	5M
	OR	
15. B).	Discuss about Various memory Allocation Methods including Free Space Management.	10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30444

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Cellular & Mobile Communications

(Electronics & Communication Engineering)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Why mobile cells are arranged in hexagonal shape? 2 M
2. What is Microcell Zone Concept? 2 M
3. Discuss the causes of signal fading in multipath propagation. 2 M
4. List various diversity techniques. 2 M
5. Interpret the different Antennas used in Space diversity. 2 M
6. What are mobile Antennas? 2 M
7. Outline the use of paging channels. 2 M
8. Explain the functioning of Overlaid cells. 2 M
9. What is Forced handoff ? 2 M
10. Write the general formula of dropped call rate. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Analyse the propagation attenuation in Uniqueness of mobile radio environment. 10M

OR

11. B). Derive the expression for carrier-to-interference ratio in a cellular system for normal case with an Omni-directional antenna system. 10M

12. A). Explain the Design of an Omnidirectional Antenna System in the worst case. 10M

OR

12. B). Discuss the different types of diversity techniques in detail. 10M

13. A). Derive the general formula for mobile propagation and explain the laws of propagation. 10M

OR

13. B). Illustrate the Space diversity antennas and Umbrella pattern antennas. 10M

14. A). Discuss how the channels are numbering and grouping into sub system in frequency management. 10M

OR

14. B). With relevant diagrams Explain the concept of Channel sharing, borrowing. 10M

15. A). Explain in detail about the Handoff initiation and list Advantages of handoff. 10M

OR

15. B). Describe briefly about the
i) Mobile assisted
ii) soft handoff
iii) Intersystem handoff 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30544**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Internet of Things

(CSC)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define IoT and write the characteristics of IoT.	2 M
2.	List the functional blocks of IoT.	2 M
3.	Explain briefly node discovery necessary in a network.	2 M
4.	Why data dissemination is important?	2 M
5.	Why security is essential in IoT?	2 M
6.	Explain briefly the importance of design challenge in IoT.	2 M
7.	List the different elements of home automation system.	2 M
8.	What role does IoT play in healthcare?	2 M
9.	What are the advantages of using Python for IoT development?	2 M
10.	What types of applications can be created using IoT technology?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the physical & logical design of the IoT with a neat sketch.	10M
	OR	
11. B).	Illustrate IoT communication models with neat sketches.	10M
12. A).	Describe the following concepts: i) MAC protocol survey and ii) Survey of routing protocols.	10M
	OR	
12. B).	Compare and contrast data aggregation and dissemination methods in IoT networks.	10M
13. A).	Demonstrate how specific security challenges in IoT can be mitigated?	10M
	OR	
13. B).	Analyze the impact of different development challenges on IoT projects.	10M
14. A).	Explain the components required for industry applications using IoT.	10M
	OR	
14. B).	Demonstrate how surveillance application models using IoT can be implemented in real-world scenarios.	10M
15. A).	Explain how IoT tools are used to develop applications?	10M
	OR	
15. B).	Explain how to apply embedded system platforms to develop a sensor-based application?	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30542**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Cloud Computing

(CSM)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What is distributed Computing? 2 M
2. What is the difference between grid computing and cluster computing? 2 M
3. What is the National Institute of Standards and Technology (NIST) definition of cloud computing? 2 M
4. How does cloud computing address the issue of scalability for businesses? 2 M
5. What are the three main service models of cloud computing? 2 M
6. What are the phases of cloud migration? 2 M
7. Give examples of IaaS providers. 2 M
8. What are the advantages of PaaS? 2 M
9. What is the Salesforce Service Cloud? 2 M
10. What is the SAP HANA Cloud Platform? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Discuss the key characteristics of distributed computing. How does it differ from centralized computing models? 10M

OR

11. B). Explain the concept of optical computing and how it differs from electronic computing. 10M

12. A). Explain the concept of "Cloud Computing as a Service." 10M

OR

12. B). Explain the five essential characteristics of cloud computing as defined by NIST. 10M

13. A). Explain the different layers in cloud computing architecture. 10M

OR

13. B). Describe the key considerations and steps involved in migrating applications to the cloud. 10M

14. A). Describe the fundamental concept of Infrastructure as a Service (IaaS). How does IaaS differ from other cloud service models. 10M

OR

14. B). Explain the concept of Software as a Service (SaaS). 10M

15. A). Describe the architecture and key services of Microsoft Azure. 10M

OR

15. B). Discuss the features and benefits of Salesforce's Sales Cloud and Service Cloud. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30537**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Data Analytics with R

(CSM)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. List out the data types available in R. 2 M
2. What is a data frame? 2 M
3. How to import a data? 2 M
4. What is the dirty data? 2 M
5. Differentiate ceiling() and floor() math functions. 2 M
6. Define minima and maxima. 2 M
7. How can we save graphs to a file? 2 M
8. How do you calculate covariance in R? 2 M
9. What is the difference between classification and clustering? 2 M
10. Define smoothing. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Explain about basic math and variables of R. 5M
ii) Explain if-else statement with examples. 5M

OR

11. B). i) Write a R function to check whether the given number is palindrome or not. 5M
ii) Illustrate how to return multiple values from a function in R. 5M

12. A). i) Explain in detail how to Export data to a text file with an example. 5M
ii) Find the mean, median and standard deviation of 2,4,9,10,14,28,52,65,73,88. 5M

OR

12. B). i) Discuss in detail how to visualize a single variable with an example. 5M
ii) Compare and contrast data exploration versus presentation. 5M

13. A). i) Explain apply() and sapply() functions in R with an example. 5M
ii) A random sample of size 100 is taken from an infinite population having mean 76 and variance 256. What is the probability that $\bar{X}$ will be between 75 and 78. 5M

OR

13. B). Describe the role of Markov chains in data analytics with an example. 10M

14. A). i) Fit a binomial distribution to the following data 5M

X:	0	1	2	3	4	5	6
R:	5	18	28	12	7	6	4

ii) Discuss about plot() and abline() functions with example. 5M

(P.T.O..)

OR

14. B). i) Calculate the coefficient correlation to the following data. 5M

X:	10	12	18	24	23	27
Y:	13	18	12	25	30	10

ii) Write R program to generate the probability distribution table for number of successes from a binomial distribution where n=5 and probability of success in each trail is 0.25 5M

15. A). Explain K-means clustering with an example. 10M

OR

15. B). Compare and contrast Decision tree classifier and Naïve Bayes classifier. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A36612**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Natural Language Processing

(AIM)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Discuss the trade-offs between accuracy and computational efficiency in developing NLP models. 2 M
2. What are some common types of grammatical rules used in grammar-based language models? 2 M
3. What criteria are used to rank documents in an IR system? 2 M
4. What are lexical resources in the context of Natural Language Processing (NLP)? 2 M
5. What is word-level tasks in NLP, and why are they important? 2 M
6. How does probabilistic parsing differ from deterministic parsing? 2 M
7. What is word sense disambiguation (WSD)? How does it play crucial role for accurate language understanding? 2 M
8. Outline various methods for discourse processing in NLP. 2 M
9. Outline the major steps in Natural Language Generation models. 2 M
10. Briefly Categorize the various issues in Machine Translation systems. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain various Steps to perform Natural Language processing with its various challenges. 10M

OR

11. B). Compare and contrast grammar-based language models with statistical language models. 10M

12. A). Discuss the common evaluation metrics used to assess the performance of IR systems? 10M

OR

12. B). Discuss the limitations of lexical resources in handling slang, neologisms, or domain-specific terminology with example. 10M

13. A). What is morphological analysis? How does it contribute to tasks like stemming and lemmatization? 10M

OR

13. B). Explain with an example of how probabilistic parsing can disambiguate between different parse trees. 10M

(P.T.O..)

14. A). Provide example of word sense ambiguity and how changing context can alter the meaning of ambiguous words. 10M

OR

14. B). What is reference resolution in NLP? Explain various Algorithms for Discourse Segmentation. 10M

15. A). Discuss Natural language Generation system with its various blocks of processing in detail. 10M

OR

15. B). Discuss the Corpus based Machine Translation with an example in NLP. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30530

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Artificial Intelligence

(CSD)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Distinguish between uniformed and informed search techniques. 2 M
2. List the application areas of AI. 2 M
3. List the types of knowledges. 2 M
4. What is Syntax of First Order Logic? 2 M
5. Write the Characteristics of Dempster Shafer Theory. 2 M
6. What is Multi agent planning? 2 M
7. What is Supervised learning? 2 M
8. What is symbol-based learning? 2 M
9. What is the language model in NLP? 2 M
10. Explain robotic hardware. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Define Artificial Intelligence. Explain the techniques of A.I. Also describe the characteristics of Artificial Intelligence? 5M

ii) What is hill climbing? Explain different types of hill climbing search techniques. 5M

OR

11. B). Illustrate the Breadth-First Search (BFS) and Depth-First Search (DFS) Algorithm with example. 10M

12. A). Detailed explanation of knowledge representation techniques and schemas. 10M

OR

12. B). Discuss about First Order Logic. 10M

13. A). Describe the Bayesian network through an example by creating a directed acyclic graph. 10M

OR

13. B). Define planning? Explain representation of planning and partial order planning. 10M

14. A). List and explain types of learning in artificial intelligence. 10M

OR

14. B). Detail the expression of neural networks? And current trends in artificial intelligence. 10M

15. A). Define NLP. What is information retrieval and information extraction in NLP? 10M

OR

15. B). Define Robotics. Explain robotic software architecture. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A36704

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VI Semester Regular/ Supplementary Examinations Jun/ July-2024

Course Name: Data Science using R

(AID)

Date: 08.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Create a 3-dimensional array in R. 2 M
2. Describe various data types in R. 2 M
3. Define mean, median, mode and standard deviation. 2 M
4. The maximum temperature in celcius in a week is given as (35,42,38,25,28,36,40). Draw the bar plot for the given data. 2 M
5. Explain the concept of data frames. 2 M
6. List the differences between vector and list. 2 M
7. Explain the usage of lapply( ) and get( ) functions. 2 M
8. Define for loop. 2 M
9. What is multinomial regression? 2 M
10. Illustrate the importance of Data Visualization. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Difference between big data and data science. 5M
ii) Explain datafication. 5M

OR

11. B). i) A random sample of size 100 is taken from an infinite population having mean 76 and variance 256. Calculate the probability that x will be between 75 and 78. 5M
ii) The probability density function of a random variable is given by f(x)=k(1-x 2) for 0<x<1 0 otherwise. find the value of k and the probabilities between 0.1 and 0.2. 5M

12. A). i) Explain the formulas of means and variances for various statistical distributions. 5M
ii) Explain different types of attributes. 5M

OR

12. B). For the discrete probability distribution Find k, mean, variance. 10M

X	0	1	2	3	4	5	6
F	0	2K	2K	3K	K^2	$2K^2$	$7K^2+K$

13. A). How the Random vectors created with a set of functions explain with suitable example. 10M
i) If a vector is passed to an arithmetic calculation how it will be computed.
ii) If the vectors involved are of different lengths what will be the resultant vector.

(P.T.O.)

OR

13. B). Discuss about reading data frame from a file and writing to a file and how will you merge two data frames in R programming language. 10M

14. A). i) Illustrate the concept of recycling in vectors. 5M
ii) Explain conditional statement. 5M

OR

14. B). Discuss about points() and legend() functions and differences between min( ) and pmin( ) functions. 10M

15. A). Explain the following: 10M
i) Logistic regression.
ii) Linear and Multilinear regression.

OR

15. B). Discuss about various visualization techniques. 10M

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