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**CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)**

Examination : M.Tech I Semester Supplementary Examinations August-2025
Course Name : Advanced Data Structures
Course Code : B458302
Branch : Computer Science & Engineering
Date & Session : 26-08-2025 AN **Duration:** 3 hours **Max. Marks:** 60

(Note: Assume suitable data if necessary)

PART-A

**Answer all TEN questions
Each question carries ONE mark.**

10x1=10M

1. Define Weight-Biased Leftiest tree. 1 M
2. Construct the Min Heap using 2, 7, 4, 9, 8, and 5. 1 M
3. What is home bucket in division hash function? 1 M
4. Find the number of possible keys, when the key length is six characters? 1 M
5. Write the properties of a B Tree 1 M
6. What is the significance of Red-Black tree? 1 M
7. What is a compressed Binary Trie 1 M
8. What is a digital search tree? 1 M
9. What is pattern matching? 1 M
10. What is Brute force? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Describe the following with suitable example (i) Cascading Cut (ii) Deletion from an Fibonacci Heap. 10M

OR

11. B). Define Binomial Heap and write the Class definition of a binomial heap. 10M

12. A). Explain the hash functions (i) Division method (ii) Multiplication method (iii) Mid Square method (iv) Folding method with suitable examples. 10M

OR

12. B). Define Hash Table. How do you represent Hash Table with Linear probing and Quadratic probing? Explain. 10M

13. A). Describe the steps to joining Red-Black Trees 10M

OR

13. B). Describe Bottom-up Splay Tree with suitable example. 10M

14. A). Explain suffix tree with suitable example. 10M

OR

14. B). Describe the following with suitable example (i) Compressed Tries with Skip Fields (ii) Compressed Tries with Labeled Edges. 10M

15. A). Describe the Boyer – Moore algorithm for pattern matching. 10M

OR

15. B). Describe the Naïve String with suitable example. 10M

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R22



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : M.Tech I Semester Supplementary Examinations Aug/Sept-2025
Course Name : Deep Learning
Course Code : B458402
Branch : Computer Science & Engineering
Date & Session : 01-09-2025 AN **Duration:** 3 hours **Max. Marks:** 60

(Note: Assume suitable data if necessary)

PART-A

**Answer all TEN questions
Each question carries ONE mark.**

10x1=10M

1. Give example of a feed forward neural network. 1 M
2. What is unit saturation in the context of neural networks? 1 M
3. How pooling handles inputs of varying size? 1 M
4. State the role of the latent space in a Variational Auto encoder. 1 M
5. Illustrate the challenges of image segmentation in real-world applications. 1 M
6. Outline some common applications of automated image captioning. 1 M
7. What is the Continuous Skip-Gram model in the context of word embeddings? 1 M
8. List any three applications of NLP with examples. 1 M
9. How is NER applied in real-world applications? 1 M
10. Define parsing in natural language processing. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the concept of backpropagation in neural networks and its role in adjusting network parameters during training. How does backpropagation facilitate gradient descent optimization and why is it crucial for deep learning? 10M

OR

11. B). i) Discuss L2 Regularization (Ridge Regression) methods. 5M
ii) Explain the concept of dropout in neural networks. How does it work during the training process, and why is it used to reduce overfitting? 5M
12. A). i) Draw and explain the architecture of convolutional neural network. 5M
ii) Explain the structure of a Recurrent Neural Network (RNN) and how it differs from a feedforward neural network. 5M

OR

12. B). i) Describe the architecture and working of an auto encoder. 5M
ii) Discuss the attention mechanism in neural networks. 5M
13. A). i) Describe the concept of object detection and how it identifies and localizes objects within an image. 5M
ii) Discuss the use of GANs in image generation tasks and their applications. 5M

OR

13. B). i) Outline the process of converting video to text using LSTM. 5M
ii) Explain how attention mechanisms enhance object detection tasks. 5M

(P.T.O..)

14. A). i) Describe the vector space model of semantics in NLP. 5M
ii) What are word vector representations and how do they differ from traditional methods like bag-of-words? 5M

OR

14. B). i) Discuss the Continuous Bag of Words (CBOW) model in detail. 5M
ii) Demonstrate how word similarity is used in machine translation. 5M

15. A). Explain the role of Recurrent Neural Networks (RNNs) in opinion mining. How do RNNs help in capturing the sentiment expressed in sequential data? 10M

OR

15. B). Demonstrate how LSTM networks are applied in dialogue generation tasks. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : M.Tech I Semester Supplementary Examinations Aug/Sept-2025
Course Name : Software Quality Engineering
Course Code : B458405
Branch : Computer Science & Engineering
Date & Session : 03-09-2025 AN **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark.

10x1=10M

1. Define software quality. 1 M
2. What are the perspectives on quality? 1 M
3. Define software fault tolerance 1 M
4. What are formal methods in QA? 1 M
5. Define quality engineering. 1 M
6. What is the goal of quality improvement? 1 M
7. Define result checking. 1 M
8. What is test automation? 1 M
9. Define support software. 1 M
10. What are the limitations of checklist-based testing? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Discuss the correctness and defect measurement techniques. 10M
- OR**
11. B). Explain the role of ISO-9126 in ensuring software quality. 10M
12. A). Explain the classification of QA in dealing with defects. 10M
- OR**
12. B). Analyze the role of safety assurance in software fault containment. 10M
13. A). Discuss goal setting and strategy formation in quality planning. 10M
- OR**
13. B). Analyze the importance of quality engineering in the software process. 10M
14. A). Explain the test planning, execution, and result-checking process. 10M
- OR**
14. B). Evaluate different approaches for analysis and follow-up activities in testing. 10M
15. A). Explain the concept and process of usage-based statistical testing. 10M
- OR**
15. B). Construct an operational profile for cartridge support software (Case Study). 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : M.Tech I Semester Supplementary Examinations Aug/Sept-2025
Course Name : Research Methodology and IPR
Course Code : B420303
Branch : SE/ PE/ ES & CSE
Date & Session : 10-09-2025 AN **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark.

10x1=10M

1. Define the research problem. 1 M
2. What is research error? 1 M
3. What is research ethics? 1 M
4. Explain the term "plagiarism". 1 M
5. List out the main parts of research report. 1 M
6. What is research proposal? 1 M
7. Write a short note on copyright. 1 M
8. Define patent. 1 M
9. What is the primary purpose of patent? 1 M
10. Which type of intellectual property protects inventions? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Critically analyze the various sources from which research problems can be identified. Discuss how these sources contribute to the development of meaningful and impactful research questions. 10M

OR

11. B). Examine the different approaches of investigation of solutions for research problem. 10M
12. A). What ethical issues might arise from using studies from questionable journals or with unclear data? How should you address these issues? 10M

OR

12. B). What approaches can you use to assess the quality and reliability of the sources you include in your literature review? 10M
13. A). Analyze the key elements that contribute to effective technical writing. Discuss how each element impacts clarity, usability, and accuracy in technical documents. 10M

OR

13. B). Apply the steps involved in writing a research paper to create an outline for a paper on a given topic. Include key sections and describe the purpose of each section. 10M

(P.T.O..)

14. A). Describe the procedure for granting a patent. Include the key steps involved from filing the application to the final grant of the patent and explain the significance of each step in ensuring the protection of an invention. 10M

OR

14. B). Compare and contrast patents, designs, trademarks, and copyrights. For each type of intellectual property, describe its purpose, the criteria for protection, and the duration of protection. 10M

15. A). Write a note on: (i) Scope of patent rights (ii) Geographical indications. 10M

OR

15. B). Examine and discuss the new developments in IPR. 10M
