

Roll No. :173757.....

Total No. of Pages : 4

MCA-T303

MCA (III-Semester) Examination, 2023-24

EMBEDDED SYSTEMS

Time Allowed : Three Hours

Maximum Marks : 80

Part-A [Marks : 20]

Note: Answer all questions (50 words each). All questions carry equal marks

Part-B [Marks : 40]

Note: Answer five questions (250 words each), selecting one from each Unit. All questions carry equal marks.

Part-C [Marks : 20]

Note: Answer any two questions (300 words each). All questions carry equal marks.

Part-A

1. Answer the following :

- (i) Write the functional requirements of the embedded system.

(ii) Differentiate between VLIW and Superscalar Architecture.

(iii) What are timers and counters?

(iv) What do you mean by bus arbitration?

(v) Write down the steps of Application specific instruction set processor Design.

(vi) What do you mean by design space exploration?

(vii) Differentiate between SDRAM and RDRAM.

(viii) How does CAN differ from 12C?

(ix) What are the characteristics of the micro-controller?

(x) What is fixed point DCT?

Part-B

Unit-I

2. Discuss the different issues to be considered in designing an Embedded System in RTOS environment.

3. Discuss the scheduling architecture used in embedded system design.

Unit-II

4. What is need timer in 8051? Explain the Timer/Counter working operation in 8051.

5. How can one optimize design of custom processors?

Unit-III

6. Discuss in brief about any two arithmetic circuits used in data path Design.

7. Illustrate about various software utility tools.

Unit-IV

8. Construct and describe the memory hierarchy of an embedded system.

9. Discuss about the working of IrDA.

Unit-V

10. Explain the working of Digital Camera.

11. Write the differences between informal and refined functional requirements.

Part-C

12. What are the challenges faced while designing an embedded system? Explain the instruction level parallelism with example.

13. Explain and discuss different measures of processor performance.

14. List and describe two types of ISA that fall under each of three ISA models. Give four real world processor that fall under the types of ISA.
15. Illustrate dynamic centralized and parallel arbitration scheme implemented by PCI bus to allow multiple bus master.

 Explain the process for analyzing and evaluating microcontroller architecture. Mention two real world examples.

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Roll No. : 173757

Total No. of Pages : 4

MCA-T301

MCA (III-Semester) Examination, 2023-24 ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Time Allowed : Three Hours

Maximum Marks : 80

Part-A

[Marks : 20]

Note: Answer all questions (50 words each). All questions carry equal marks

Part-B

[Marks : 40]

Note: Answer five questions (250 words each), selecting one from each Unit. All questions carry equal marks.

Part-C

[Marks : 20]

Note: Answer any two questions (300 words each). All questions carry equal marks.

Part-A

1. (i) Define Artificial Intelligence.

(ii) Define Machine Learning.

(iii) What do you mean by CNN.

(iv) What is Kernel SVM?

(v) What do you mean by over fitting?

(vi) What is activation function?

(vii) Define precision.

(viii) Write any two applications of Neural Network.

(ix) What do you mean by reinforcement learning?

(x) What is decision tree?

Part-B

Unit-I

2. Explain Hill Climbing with example.

OR

3. Explain A* Algorithm with example.

Unit-II

4. Differentiate among ANN, RNN and CNN.

OR

5. Explain Back propagation with suitable example.

Unit-III

6. Explain Expert System with proper block diagram.

OR

7. Explain Adaptive Resonance theory.

Unit-IV

8. Explain classification & regression Trees with example.

OR

9. Explain Boosting and Bagging.

Unit-V

10. Discuss Dimensionality Reduction.

OR

11. Explain Markov Decision process.

Part-C

12. Write short notes on :

(a) Horn Clause

(b) Forward and backward chaining

13. Explain Pattern classification and function approximation.

14. Write short notes on :
- (a) Bayesian Network
 - (b) Curse of Dimensionality
15. Explain K-Means algorithm with suitable example.
16. Write short notes on :
- (a) Least squares optimization
 - (b) PCA

DIGITAL MARKETING

Part-A

1. (x) What do you mean by digital marketing?

(x) Classify the Digital Marketing Channels.

(xi) What are Meta tags?

(iv) What does SEO stand for?

(x) What is local search marketing?

(x) What is Google Ad API?

(xi) What is social media marketing?

(xiii) How can I increase my followers?

(x) What is Email marketing?

(x) Write about Ad sense.

Part-B

Unit-I

1. Compare Digital marketing with Real marketing.

2. Discuss about the steps in digital marketing plan.

Unit-II

4. What do mean by off-page optimization?

5. What does it mean keyword research?

Unit-III

6. What do you understand Google keyword planner?

7. What does it mean search volume?

Unit-IV

8. What Social Platforms Should I Use?

9. How does social media Aid SEO?

Unit-V

10. What do you mean by Web Remarketing?

11. What do you understand by E-commerce management?

Part-C

12. Describe different case studies on digital marketing strategies.
13. Explain various search engines and their techniques.
14. Explain advertisement strategies for SEM.
15. Write ad copies and case studies on social media strategies.
16. What is web analytics? Explain mobile marketing and content strategies.

MCA Semester Examination, 2024 Information system and cyber security**TIME: 3 Hours****Maximum Marks 80****PART A**

1. a. Define the term "Information Security" and explain its significance in modern organizations.
 b. What is a security policy? Discuss the key components of a security policy and explain how they contribute to establishing a robust security framework within an organization.
- c. Define cyber crime and categorize it based on different criteria. Provide examples of each category
 d. What are the implications of cyber crimes on individuals, organizations, and society as a whole
 e. List the objectives, and scope for cyber laws.
 f. Briefly explain the concept of copyright issues in cyberspace
 g. What are provisions related to the authentication of electronic records under the Information Technology Act.
 h. What are the legal framework for electronic transactions and the mechanisms for verifying the authenticity of digital records.
 i. List the objectives of copyright and its significance in protecting creative works.
 j. Explain the different types of intellectual property, including patents, trademarks, and trade secrets, and their protection under the law.

PART B

2. Deliberate the elements of information security and their role in ensuring the confidentiality, integrity, and availability of information.
3. Define the operational model of network security. Explain the various techniques and steps involved in implementing network security measures.
4. Discourse the threats posed by viruses, worms, and other malware to computer systems and networks.
5. Explain how these malicious programs propagate and the techniques used to defend against them.
6. Converse the challenges posed by digital content piracy and the legal frameworks in place to protect intellectual property rights online.
7. Pronounce the role of cryptography in ensuring information security. Discuss the various encryption techniques and their applications in securing digital communications and transactions.
8. What are the legal recognition of digital signatures under the Information Technology Act. Explain the requirements for using digital signatures for electronic transactions and the role of certifying authorities in issuing digital certificates.
9. What are the functions and responsibilities of the Controller of Certifying Authorities under the Information Technology Act.
10. What are the requirements and meaning of copyright, including the rights granted to copyright holders and the limitations on those rights.
11. What are intellectual property rights (IPR) Why its important in fostering innovation and creativity

PART C

12. Explain the basic terminologies used in network security, including terms such as encryption, authentication, access control, and intrusion detection. Provide examples to illustrate each concept and discuss their relevance in securing network infrastructure.
13. Explore the concept of cyber terrorism and its implications for national security. Discuss the motivations behind cyber terrorism, potential targets, and strategies for combating cyber terrorism threats.
14. Deliberate the benefits of adhering to frameworks such as S-E-CMM and COBIT.
15. Provide an overview of the background of the Information Technology Act 2000. Discuss its objectives, scope, and the amendments made to it over the years to address emerging cyber threats.
16. Describe the provisions of the Information Technology Act related to copyright protection. Discuss the measures taken to address copyright infringement in cyberspace and the role of intermediaries in copyright enforcement.

COMPILER DESIGN

173757

PART A

1.
 - a) Discuss significance of lexical analysis.
 - b) What is LEX compiler.
 - c) Write regular expressions for the following tokens: a) Integer literals b) Identifiers
 - d) Discuss about brute force parser
 - e) List the advantages and limitations of bottom-up evaluation in the context of syntax-directed translation
 - f) Differentiate between synthesized and inherited attributes.
 - g) List the types of errors encountered during the compilation process, focusing on lexical and syntactic phase errors.
 - h) What are the syntactic phase errors
 - i) Briefly discuss the storage allocation strategies
 - j) What is loop optimization. Explain with example.

PART B

2. Discuss the process of lexical analysis in compiler construction. Explain how tokens are specified and recognized.
3. What are the main phases of a compiler? Briefly describe each phase
4. Compare and contrast top-down parsing and bottom-up parsing techniques.
5. Explain the concept of LR(1) parsing. How is it different from LR parsing?
6. Discuss syntax-directed translation schemes and their implementation.
7. Discuss common sources of semantic ambiguities in L-Attributed Definitions
8. Explain the three address code implementation techniques with suitable example
9. Explain the process of run-time storage management in block-structured languages.
10. Describe the concept of peephole optimization.
11. Discuss the challenges and considerations in implementing a simple code generator.

PART C

12. Discuss the importance of input buffering in the design of lexical analysers.
13. Consider the following grammar:
$$E \rightarrow E + T \mid T \quad T \rightarrow T * F \mid F \quad F \rightarrow (E) \mid id$$

Create a parsing table for the above grammar, choose any parsing technique (e.g., LL(1), LR(1), etc.), as well as draw the syntax tree for it.
14. Write Syntax directed translator to implement calculator
15. Describe symbol tables, their operations, and implementation
16. Describe the process of intermediate code generation. Why is it important in compiler construction?

PART A

- a) List the major applications of Soft Computing?
- b) Why we need Soft Computing techniques?
- c) Explain activation function.
- d) What is Back propagation Neural Network
- e) Explain with proper diagram : Crossover points, core and normality of fuzzy set
- f) Write the equations of Gaussian Membership function with supporting diagram
- g) Define Genetic algorithm and draw the SGA framework
- h) What are the crossover and mutation operators in genetic Algorithms. Why they are required.
- i) What is swarm intelligence.
- j) List ten optimization techniques based on swarm intelligence.

PART B

2. Can soft computing techniques be applied to all domains? Justify your answer
3. Discuss in brief any one application area where the soft computing techniques are applied and one domain it cannot be applied
4. Draw a labelled diagram to show how a Single layer Perceptron's works
5. Discuss about Convolution neural network
6. Explain the process of Fuzzification
7. For the two fuzzy sets given below calculate the union, intersection, complement, products, cartesian product. $A = \{(x_1, 0.5), (x_2, 0.1), (x_3, 0.4)\}$ and $B = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.5)\}$
8. Discuss the various GA operators
9. What is SSGA. Discuss its flowchart.
10. Give the velocity and position update equation of basic PSO algorithm
11. What is MOEA

PART C

12. With respect to degree of membership of elements in a fuzzy set differentiate between hard and soft computing with proper equation and a suitable labelled example

13. Differentiate between feed forward and Back propagation Neural Network

14. Prepare a fuzzy engine to solve tipping problem in hotel industry where inputs/output conditions are as

- a. Service can range from 0 to 10 points given by customer
- b. Food quality can range from 0 to 10 points given by customer
- c. Tip can range from minimum 5 Rs to maximum 25 Rs

You can take your own range to decide levels for low medium, and high for a, b and c above

OR

Determine the wash time of a fuzzy controller based domestic washing machine if the inputs are dirt & grease on clothes which can vary from 0 to 100 percent. Use two descriptors for input variables and three descriptors for output variable wash time which can vary from 0 to 45 minutes. Derive the set of rules for controller action and de fuzzification. The design should be supported by Figure wherever possible. Calculate the wash time if dirt is 60 and grease is 30 percent.

15. Discuss the working of Real coded Genetic algorithm with its application area and its comparative with respect to binary GA.
16. Which optimization algorithm is better among genetic and ant colony optimization. Give the case situation for your proof also.