M.Sc. (Final) DEGREE EXAMINATION

Second Year

Information Technology

Paper I — SOFTWARE ENGINEERING

Assignment-1

Answer All questions.

1. Explain characteristics of Software that are considerably different than those of Hardware.
2. Explain Incremental Process models.
3. Explain briefly about Interaction diagrams of UML with an example.
4. Explain various core principles that focus on software engineering practice as a whole.
5. Write an essay on Integration testing methods and Unit testing methods.
6. Define Pattern. Describe an Analysis Pattern with any two benefits.
7. What is Domain Analysis? Explain with neat diagram.
8. Differentiate between Control Specification and Process Specification.

Assignment-2

Answer All questions.

9. Explain communication principles.
10. How do we assess the quality of a software design?
11. Write an essay on Integration testing and Unit testing.
12. Explain various White-Box Methods with an example.
13. What is Quality Function Development (QFD)?
14. What is Successful test?
15. Define Stakeholders.
16. What is Architecture?
17. What is Swimlane Diagram?
18. What is CRC?

M.Sc. (Final) DEGREE EXAMINATION

Second Year

Information Technology

Paper II — PROGRAMMING WITH C++

Assignment-1

Answer All questions

1. (a) What are the advantages of function prototypes in C++?
   (b) What do you meant by over loading of a function? When do we use this concept?
2. Define a class to represent a bank account. Include the following members.
   (a) Data members :
      (i) Name of the depositer.
      (ii) Account number.
      (iii) Type of account.
      (iv) Balarice amount of the account.
   (b) Member functions :
      (i) To assign initial values.
      (ii) To deposite an amount.
      (iii) To withdraw an
      (iv) To display name and balance.
3. (a) What is a constructor? How do we invoke a constructor function?
   (b) What do you mean by dynamic initialization of objects? Why do we need to do this?
4. What is inheritance? Explain different types of inheritance.
5. Distinguish between the following terms.
   (a) Objects and Classes.
   (b) Dynamic binding and message passing.
6. Describe the major parts of a C++ program.
7. What do you mean by dynamic initialization of a variable? Give an example.
8. How does a C++ structure differ from a C++ class?

Assignment-2

Answer All questions.

9. Describe the importance of destructors.
10. What does inheritance mean in C++?
11. Explain the concept of polymorphism. Give an example.
12. Explain the friend function with an example.
13. What is a virtual base class and an abstract class?
14. (a) What is object-oriented programming?
    (b) Define member functions in C++.
    (c) Define copy constructor.
    (d) What is an iterator?
    (e) Static binding Vs dynamic binding.

M.Sc. (Final) DEGREE EXAMINATION

Second Year

Information Technology

Paper III — TCP/IP

Assignment-1

Answer All questions.

1.Discuss in detail about network technologies.

2.Explain in detail about Internet Addresses.

3. Explain about TCP/IP over ATM networks.

4. (a) Explain features of proxy ARP.

(b) Explain the features of primary and backup RARP servers.

5. Discuss in detail about UDP.

6. Explain the process of IP data gram by look back interface.

7. Write about DNS.

8. Brief about client/server model.

Assignment-2

Answer All questions.

9. Explain about subnet addressing and subnet masking.

10. Write about mobile IP.

11. Write the features of Dynamic host configuration protocol.

12. Explain advantages and disadvantage of layering architecture.

13. Discuss the properties of an Ethernet.

14. Write IP header format.

15. What is ATM network?

16. What is message protocol?

17. What is IP rating?

18. What is proxy ARP?

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M.Sc. (Final) DEGREE EXAMINATION

Second Year

Information Technology

Paper IV – DATA MINING TECHNIQUES

Assignment-1

Answer All questions.

1.Describe the use of probability theory in data mining.

2. Explain in detail various data mining algorithms.

3. Describe in detail the search methods in data mining.

4. Describe in detail regression as a predictive model.

5. Describe various features of partition based clustering algorithms.

6. Describe the data quality for individual measurements.

7. What are the desirable properties of estimators?

8. Explain descriptive modelling.

Assignment-2

Answer All questions.

9. Explain the role of optimization in data mining.

10. Explain supervised learning.

11. What are the core functions of a data mining algorithms?

12. Explain how predictive modelling is used in classification.

13. Distinguish between models and patterns.

14. What is exploratory data analysis?

15. Define tree classifiers.

16. Define clustering.

17. Define classification.

18. Define pattern.

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M.Sc. (Final) DEGREE EXAMINATION

Second Year

Information Technology

Paper V — CRYPTOGRAPHY AND NETWORK SECURITY

Assignment-1

Answer All questions.

1.Draw and explain model for network security.

2. Give and explain block cipher modes of operation.

3. Explain DES and simplified DES.

4. (a) Find Euler's Totient function of $\phi(10)$.

   (b) State and prove Euler's theorem.

5. Explain RSA algorithm with an example.

6. What is the difference between stream cipher and block cipher?

7. Distinguish between symmetric and asymmetric cryptography.

8. Describe Elliptic curve Cryptography.

Assignment-2

Answer All questions.

9. Explain the difference between a message authentication code and a one-way Hash function.

10. Describe SSL architecture.

11. Explain firewall design principles.

12. Give the limitationis of SET.

13. Explain digital signature algorithm.

14. Write about :
   (a) Authentication.
   (b) Security attacks.
   (c) Secure Electronic Transaction (SET).
   (d) Secure Socket Layer (SSL).
   (e) Encapsulation Security Payload (ESP).

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M.Sc. (Final) DEGREE EXAMINATION
Second Year

Information Technology

Paper VI — ARTIFICIAL INTELLIGENCE

Assignment-1

Answer All questions.

1. What is Intelligent system? What are the approaches to building Intelligent Systems?

2. Compare and contrast this heuristic functions used in each of the following cases :

   (a) Towers of Hanoi problem

   (b) 8-puzzle

   (c) Theorem proving. (Using means-ends analysis techniques)

3. What are the limitations of predicate logic as a tool for knowledge representation? Illustrate through examples.

4. Write the unification algorithm and explain why it aims at finding most general unifiers.

5. Explain semantic nets. Suggest a semantic net to describe the main organs of the human body.

6. Show that the "Tower of Hanoi" "problem can be classified under the area of AI. Give a state space representation of the problem.

7. Explain Hill Climbing.

8. Explain partial order planning.

Assignment-2

Answer All questions.

9. Write about fuzzy logic.

10. Discuss about back propagation training.

11. Write about Bayesian networks.

12. Give commercial expert system for backward reasoning.

13. Explain symbol based learning techniques.

14. What is predicate?

15. What is frame?

16. What is instance?

17. What is script?

18. What is backtracking?