SSESA's, Science College, Congress Nagar, Nagpur

Computer Architecture and Organization

Assignment List

M.Sc. Semester – I

Session 2024-25

1. Explain in detail the different layers used in Computer architecture.
2. What is instruction? What are its types? Explain each one with its formats.
3. Explain machine cycle and instruction cycle of a processor in detail.
4. What are addressing modes? Explain different types of addressing modes with suitable example.
5. Explain the hardwired control design approach.
6. What is pipelining? Explain in detail. State its advantages.
7. What is RISC and CISC ? Difference between RISC and CISC and give their advantages and disadvantages.
8. Explain superscalar processors in detail.
9. What is storage device ? Explain the different storage technologies with an example .
10. Describe a structure of dynamic address translation system.
11. Design a memory unit of 16 KB RAM using suitable number of available 2 KB RAM. Give the suitable decoder design also.
12. What is virtual memory? Explain the concept of paging and segmentation.
13. Describe the daizy-chain priority interrupt system in detail.
14. What are the different data transfer techniques? Explain with suitable block diagram.
15. Discuss the Transaction processing benchmark in detail .
16. What is DMA ? What are its advantages ? Explain the cycle-stealing mode of operation of DMA in brief.

Head

Department of Computer Science

Professor & Head
Department of Computer Science
S. E. S. Arts & Science College
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Compiler Construction

Assignment List

M.Sc. Semester – I

Session 2024-25

1. Classify the concepts of Compiler and Interpreter with well labeled diagram.
2. Explain the various phases of compiler with an illustrative example.
3. Give the Applications of Compiler Technology.
4. Explain the various Compiler Construction Tools and Evolution of Programming Language.
5. Define Parsing. Also explain Top-Down Parsing & Predictive Parsing.
6. Explain the role of lexical analyzer in detail with necessary example.
7. Write a short note on Syntax Directed Translation.
8. What are the various parts in "LEX" Program?
9. Describe Three-Address Code with example.
10. Explain Context free grammar with example.
11. Write short note on Synthesized attributes & Inherited attributes.
12. What is Intermediate code and write two benefits of Intermediate code generation.
13. Discuss the various storage allocation strategies in detail.
14. Explain in detail about optimization of basic block.
15. What are the issues in design of a code generator? Explain.
16. Explain DAG representation of the basic block with example.

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Department of Computer Science
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Department of Computer Science

Assignment List
Session 2024-25
Practical - II (Research Methodology)
M. Sc. Semester-I

1) What is Research? And explain its types.
2) Differentiate between research methods and methodology.
3) Explain research process in detail.
4) What are the technique involved in defining a problem?
5) Write the different methods of data collection.
6) Explain the classification of data processing.
7) Describe the visual aids for quantitative data analysis.
8) Explain the data preparation and data analysis of analyzing textual data.
9) What is interpretation? What is the need of interpretation?
10) What are the different steps in report writing?
11) Write a mechanics of writing a research paper?
12) What are the precaution for writing a research report?
13) Explain the term 'Writing Scientific Report'.
14) Write notes on Revision and Refining.
15) What is the process for writing for international journal?
16) How can you make a good presentation even more effective?

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Assignment List

Session 2024-25

M. Sc. Semester-III

(Practical – I)

Paper-I (Advanced Software Engineering)

1. Explain role of software engineering and software myths in detail.
2. Explain a) waterfall model b) RAD model c) Incremental model.
3. What is process? Explain process framework activities.
4. Explain Agile process model and explain their techniques in detail.
5. What is system modeling? Explain any three in details with diagram.
6. Explain design Engineering? Explain design process and design quality in detail.
7. Explain Design Concepts evolved over the history of software Engineering.
8. Explain Design Model in detail.
9. Explain test strategies for conventional software.
10. Explain a) white box testing b) black box testing.
11. Explain the Software Quality Assurance in detail.
12. Describe the process of developing an RMMM plan for a software project.
13. What are software metrics, and why are they important in software development?
14. Describe the different methods used for software sizing in detail.
15. What is Software Configuration Management (SCM), and why is it important in software development
16. Describe the different levels of the COCOMO model in detail.

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Network Security
Assignment List
M.Sc. Semester – III
Session 2023-25

1. List & briefly define categories of security services.
2. What is the OSI Security Architecture?
3. Why is the Caesar cipher substitution technique vulnerable to a brute force cryptanalysis?
4. What is transposition cipher?
5. Explain DES Algorithm in detail.
6. Briefly describe the RSA algorithm.
7. What is a Message Authentication Code
8. Describe DES Algorithm in detail.
9. Explain Public Key Infrastructure.
10. What are the requirements defined for Kerberos
11. What is the purpose of the X.509 standard?
12. What characteristics are needed in a secure hash function.
13. Explain Software Vulnerabilities.
14. Define Firewalls and its types
15. Explain Wireless Security in detail.
16. What is Security of the Internet of Things.

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Department of Computer Science

Professor & Head
Department of Computer Science
S.S.E.S. Amt's Science College
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Internet of Things

Assignment List

M.Sc. Semester – III

Session 2024-25

1. Define Internet of Things. State its components and applications.
2. Explain design patterns of IOT in detail.
3. What is seven layer IOT architecture? Explain in detail each layer.
4. Define pumps. Explain the application of pumps with respect to IOT.
5. Explain in detail CoAP SMS. State in detail CoAP communication.
6. Define Message Queuing Telemetry Transport. Explain in detail.
7. Explain in detail about Hyper text transfer protocol. State its important features.
8. Explain in detail edge based IoT platforms. State its examples.
9. Explain data collection techniques. Give tools for storing the collected data.
10. Explain in detail the methods by which we can perform data analysis in detail.
11. What are the security challenges with IoT devices? Explain in detail.
12. Explain in detail with example techniques for securing IoT devices.
13. Explain in detail about the data types and control structures used in Arduino.
14. What are sensors? Explain different types of sensors with example in detail.
15. Explain in detail case study on IoT applications for Smart Homes.
16. State a case study about environment monitoring and agriculture using Ardunio.

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Department of Computer Science

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Department of Computer Science
S. Ssesa's Science College
Congress Nagar, Nagpur