# FACULTY OF ENGINEERING

### B. E. VI – Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Digital System Design using HDL Verilog

### Open Elective – I

**Time: 3 hours**        **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**        **(10 x 2 = 20 Marks)**

1. Define synthesis.
2. Write the Verilog code for half adder using arithmetic operator.
3. What are the uses of PLI.
4. Difference between melay and moore machinge.
5. List applications of shift registers.
6. What is RTL code?
7. Draw state Table for melay incompletely specified circuit.
8. Define state diagram and state table.
9. List Task and functions.
10. Difference between 'C' and 'HDL' language.

## PART – B

**Note: Answer any five questions.**        **(5 x 10 = 50 Marks)**

11. What are the various data tuypes in Verilog HDL.

12. Design combinational logic circuit for carry Lookahead Adder.

13. (a) Differentiate between latch and flip flop.

    (b) Design synchronous sequential circuit of State Machine M1 shown using D flip flop. Assume state assignment as A=00, B=01, C=10.

| Ps | NSZ | |
|---|---|---|
| | X=0 | X=1 |
| A | B, O | A, 1 |
| B | C, O | A, 1 |
| C | A, 1 | B, O |

14. (a) Explain CMOS switches.

    (b) Write the Verilog code for AND gate using switch level model.

15. Explain the architecture of altera complex programmable logic devices.

16. (a) Analyze and design synchronous sequential circuit.
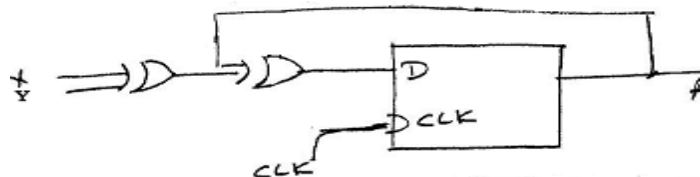


    (b) Explain representation of number in Verilog.

17. Write a short note:
    (a) CAD tools.
    (b) User define primitives.
    (c) Task and Function.

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# FACULTY OF ENGINEERING

### B. E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Electrical Energy Conservation & Safety

### Open Elective – I

Time: 3 Hours                                                                                              Max. Marks: 70

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                                                    **(10 x 2 = 20 Marks)**

1. Differentiate (i) Primary and Secondary Energy (ii) Commercial and Non-Commercial energy?
2. List the benefits of Energy Conservation for Industry, Nation and Globe?
3. Define the following terms related to Electricity Tariff:
   (i) Contract Demand  (ii) Maximum demand.
4. State First law of Thermodynamics and Second law of Thermodynamics?
5. List the various components of a motor?
6. Why power is transmitted at high voltage? Give reason.
7. List the advantages of energy efficient motors?
8. What is an Electronic Ballast?
9. What is the Current Strength – Duration equation presented by Geddes and Baker?
10. What is let-go current and its minimal value?

## PART – B

**Note: Answer any five questions.**                                               **(5 x 10 = 50 Marks)**

11 (a) What are the salient features of Electricity Act 2003?

   (b) What is Time-Of-the-Day Tariff (TOD)?

12 (a) What is energy? Define and explain the various forms of energy?

   (b) A 3-phase AC induction motor (20 kW capacity) is used for pumping operation. Electrical parameter such as current, volt and power factor were measured with power analyzer. Find energy consumption of motor in one hour? (line volts. = 440 V, line current = 25 amps and PF = 0.90).

13 (a) Draw the block diagram of a typical Electric Power Supply System, and

   explain its operation?

   (b) A 50 kW induction motor with 86% present full load efficiency is being considered for replacement by a 89% efficiency motor. What will be the savings in energy if the motor works for 6000 hours per year and cost of energy is Rs.4.50 per kWh?

14 (a) Explain the principle and Operation of Maximum Demand Controller with a diagram?

   (b) Mention the various Watt Loss Areas and corresponding Efficiency Improvement?

15 (a) Explain the various physiological effects of electricity?

(b) What is electric safety and its need? Explain the basic approaches to protection against shocks?

16 (a) Explain cascade efficiency in the Tram mission and Distribution system from output of the power plant to the end use?

(b) What is the need for parallel operation of transformers and the conditions to be satisfied for parallel operation?

17 (a) List the steps of Load Curve generation? Draw a sample Load Curve?

(b) List the factors on which a motor can be selected for efficient operation.

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# FACULTY OF ENGINEERING

**B. E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022**

**Subject: Industrial Robotics**

**Open Elective – I**

**Time: 3 Hours**                                                     **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

**PART – A**

**Note: Answer all questions.**                          **(10 x 2 = 20 Marks)**

1. Define accuracy and repeatability with respect to a manipulator.
2. Differentiate between workspace and work-envelope.
3. Explain the principle on which a piezoelectric sensor works.
4. Explain briefly about resolvers.
5. What are RPY-angles? Give its applications in robotics.
6. What is mobility of a manipulator?
7. Explain the various illumination techniques used in robot vision.
8. Compare digitization and object recognition techniques.
9. List few end-effector commands used in robot programming language.
10. Explain briefly about the economic analysis of robots.

## PART – B

**Note: Answer any five questions.**                     **(5 x 10 = 50 Marks)**

11 Compare the basic arm configurations of a cylindrical and polar robot manipulator giving their advantages, limitations and applications.

12 (a) Distinguish between resolvers and optical encoders, also give its applications in robotics.

(b) Explain any two types of position sensors used in robotics?

13 Solve and obtain the position and orientation of the tool point P with respect to the base for the 2-DOF, RP planar manipulator.

14 Explain the various techniques of image processing, and segmentation for robot applications.

15 (a) Explain the characteristics of robot level languages and task level languages.

(b) Explain how AGV works and illustrate few applications that use AGVs.

16 (a) Explain Euler-angles and give its application.

(b) Sketch any two types of mechanical and one pneumatic end-effectors.

17 Write short notes on the following:

(a) DH - Convention

(b) Drives used in industrial robots.

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# FACULTY OF ENGINEERING
## B.E. VI - Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Soft Skills and Interpersonal Skills
### Open Elective – I

**Time: 3 Hours**          **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**
### PART – A
**Note: Answer all questions.**        **(10 x 2 = 20 Marks)**

1  What is Active Listening?
2  What are Soft Skills? How do they contribute to success in a profession?
3  What is "Intensive Reading"? Give examples.
4  Highlight the key features of persuasive style of writing. Exemplify the situations where persuasive writing is used.
5  Elaborate on the important steps in making effective presentations.
6  What is a Blog? Mention four tips of their effective use.
7  Enumerate the different skills that can be developed during reading.
8  Write a short notes on Brian Storming Technique.
9  Analyse how EI can decide workplace success.
10 List the various types of learning styles.

### PART – B
**Note: Answer any five questions.**        **(5 x 10 = 50 Marks)**

11 (a) Examine how different types of listening helps in improving one's comprehension and communication.
     (b) "Hard skills and Soft skills complement each other". – Justify with appropriate examples.

12 (a) Outline the important steps in preparing for Interviews.
     (b) What are the different stages in team formation? Explain the characteristics of a good team member.

13 (a) Write briefly on the different strategies of Reading
     (b) Suggest a suitable title and write a paragraph in about 150-200 words on the given hints.
        Types of Disease
        Communicable diseases
        Medium of Infection
        Air – Influenza
        Food – Dysentery
        Water – Typhoid
        Non-Communicable or Lifestyle diseases
        Reasons Causes
        Faulty Eating habits
        Obesity
        Faulty Eating habits
        Diabetes
        Stress
        Hypertension.

14 (a) What are the important elements of writing?
   (b) Enumerate any six important principles that contribute to effective academic writing.

15 (a) Suggest a few techniques of stress management.
   (b) Elucidate on the importance of prioritization and "to do lists" effective time management.

16 (a) Explain the terms "Intrinsic" and "Extrinsic" motivation.
   (b) Analyse the suitability of different learning styles and strategies for various purposes.

17 (a) List four differences between Academic writing and General writing.
   (b) Write briefly on the different Leadership Styles and the importance of leadership.

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# FACULTY OF ENGINEERING
## B.E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Human Resource Development and Organization Behaviour
### Open Elective - I

**Time: 3 Hours**                                                 **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                             **(10 x 2 = 20 Marks)**

1. State the Parkinson's Law.
2. What is Human Relations?
3. How negotiation could be a better way to make a decision.
4. Explain the term responsibility.
5. What are five personality traits?
6. Explain the term Goal theory.
7. State Johari Windows.
8. Explain the term Conflict.
9. Explain term organization culture.
10. What is communication?

## PART – B

**Note: Answer any five questions.**                      **(5 x 10 = 50 Marks)**

11. .Explain the 3D model of Managerial behavior organization

12. Explain the different approaches in Decision making.

13. Explain the trait and behavioral approaches to leadership.

14. Discuss in brief Vroom's Decision tree approach to leadership.

15. What is model of conflict and explain its statistics?

16. Explain organization Design and explain the term organization culture.

17. What are different motivation content theories? Explain any 2 theories.

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# FACULTY OF ENGINEERING

### B. E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Cyber Law and Ethics

### Open Elective – I

**Time: 3 Hours**                                       **Max. Marks: 70**

### (Missing data, if any, may be suitably assumed)

## PART – A

**Note: Answer all questions.**                               **(10 x 2 = 20 Marks)**

1. What is Section 66 of IT Act?
2. What are the offences under the IT Act 2000?
3. Who regulates cyber security in India?
4. What are the steps in digital forensic process?
5. What are ethical and professional issues?
6. What are the 4 components of an information system?
7. What is cybercrime in IPR?
8. What kinds of threats do organizations face?
9. What is cybercrime and cyber security?
10. What is the goal of cyber terrorism?

## PART – B

**Note: Answer any five questions.**                            **(5 x 10 = 50 Marks)**

11 (a) Discuss briefly the IT Act?

    (b) Explain the concept "Threat to information resources".

12 (a) Describe the cyber security regulations.

    (b) Explain the challenges in computer forensics.

13 (a) Discuss the professional issues in information security.

    (b) Explain the terms code of ethics.

14 (a) Discuss the IPR issues.

    (b) Explain the various web threats for organizations.

15 (a) What are the security issues associated with social networking sites in cyber security? Explain them in brief.

    (b) What is intellectual property in cyber space? Explain.

16 (a) Describe briefly the concept of denial of service.

    (b) Describe the Digital Forensic lifecycle.

17 Write notes on:

    (a) Forensics Analysis of Email

    (b) Distributed Denial of Service (DDoS)

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# FACULTY OF ENGINEERING
**B.E. VI - Semester (AICTE) (Backlog) Examination, March / April 2022**
**Subject: Operating Systems**
**Open Elective - I**

Time: 3 Hours                                                                    Max. Marks: 70

**(Missing data, if any, may be suitably assumed)**
## PART – A
**Note: Answer all questions.**                                    **(10 x 2 = 20 Marks)**

1. What is meant by Race Condition? How do overcome this condition?
2. Define Monitor and state its Limitations and Advantages.
3. What is meant by Belady's Anomaly?
4. Would you explain about Thrashing?
5. Describe the advantages of Resource Allocation Graph.
6. What is meant by Authentication?
7. Write about NT Kernel.
8. Describe about Segmentation.
9. Sketch the General architecture of Window NT.
10. Describe the basic function of Process Management in Linux.

## PART – B
**Note: Answer any five questions.**                              **(5 x 10 = 50 Marks)**

11. (a) Describe the concepts of Process and Process Control Block.
    (b) What is a Critical Section Problem? What are the three conditions that the solution to a critical section must satisfy? Explain.

12. For the given set of processes, compute the Average Waiting Time and Average Turnaround Time using the following techniques and draw the Gantt Chart for each i) FCFS ii) SJF iii) RR (Time Slice =2).
    Process Scheduling methods.

| Process Id | CPU Burst Time | Arrival Time |
|---|---|---|
| P1 | 4 | 1 |
| P2 | 2 | 2 |
| P3 | 1 | 3 |
| P4 | 3 | 3 |

13 (a) Define Page Fault? When does a Page Fault occur? Describe the action taken by Operating System when Page Fault occurs.

   (b) Discuss briefly about Directory Implementation Techniques.

..2..

14. Consider the following snapshot of a system

| Process | Allocation | | | | Max | | | | Available | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | A | B | C | D | A | B | C | D |
| P0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 5 | 2 | 0 |
| P1 | 1 | 0 | 0 | 0 | 1 | 7 | 5 | 0 | | | | |
| P2 | 1 | 3 | 5 | 4 | 2 | 3 | 5 | 6 | | | | |
| P3 | 0 | 6 | 3 | 2 | 0 | 6 | 5 | 2 | | | | |
| P4 | 0 | 0 | 1 | 4 | 0 | 6 | 5 | 6 | | | | |

Answer the following questions using Banker's Algorithm:
(a) What is the content of the Matrix need?
(b) Is the system in a safe state?
(c) If a request from a process P1 arrives for (0  4  2  0),can the request be granted immediately?

15. (a) Explain about various method of Disk Management.
    (b) Describe in detail about I/O optimization.

16. (a) Explain about InterProcess Communication in Windows NT.
    (b) Would you explain in detail about Kernel Modules?

17. Write a shot note on
    (a) Access Matrix.
    (b) File System Implementation

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# FACULTY OF ENGINEERING
### B.E. VI - Semester (AICTE) (Backlog) Examination, March / April 2022

## Subject: OOP Using Java
### Open Elective - I

**Time: 3 hours**                                **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**
## PART – A
**Note: Answer all questions**                              **(10 x 2 = 20 Marks)**

1   Why is java architectural neutral?
2   What are the different ways of defining constants in java?
3   What are the differences between checked and unchecked exception?
4   Define Package.
5   Differentiate abstract class and Interface
6   Explain about Bitset and Timer.
7   What are the different ways to create a thread?
8   List the AWT controls
9   Define Serialization.
10 List the character streams.

## PART – B
**Note: Answer any five questions**                          **(5 x 10 = 50 Marks)**

11 a)  Explain the dynamic method dispatch with example.
    b)  Explain creation of a package and importing a package.

12 a)  What is a thread? Illustrate with an example the role of multi threading.
    b)  Write a program to create and use user defined exception.

13 a)  Explain the use of Comparator with example.
    b)  Explain different iterators used for accessing the elements with example.

14 a)  Write a program to illustrate the use of string tokenizer.
    b)  Briefly discuss about collection classes and collection interfaces.

15 a)  Write a program to copy data in one file into another.
    b)  Write a program to read the integer value from console and check whether it is a prime number or not.

16 Discuss in detail about Serialization with an example.

17 a)  What is the difference between paint() and repaint() methods?
    b)  Compare flow layout and border layout managers.

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# FACULTY OF ENGINEERING
### B.E. VI - Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Database Systems
### Open Elective - I

**Time: 3 Hours**               **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**
### PART – A
**Note: Answer all questions.**          **(10 x 2 = 20 Marks)**

1. What is DBMS?
2. What are the disadvantages of File processing?
3. Define Aggregate functions in SQL.
4. Define Nested Sub queries.
5. Differentiate 3NF and BCNF.
6. What are the six database objects?
7. What is a view?
8. What is the purpose of database administration?
9. Why do we need locks?
10. What is access control management?

### PART – B
**Note: Answer any five questions.**          **(5 x 10 = 50 Marks)**

11. (a) What to look for when selecting a relational database? List the benefits of RDBMS.
    (b) Explain different symbols used in E-R model with example.

12. (a) Explain in detail about Data Manipulation Languages.
    (b) Distinguish between Triggers and Procedures.

13. (a) Define normalization. Describe the condition for 1NF, 2NF, 3NF and BCNF.

14. (a) Do indexes affect performance of updates and inserts? Justify.
    (b) What are the responsibilities of DBA?

15. (a) What is Transaction? Describe ACID properties of Transaction?
    (b) Explain the role of check point in Log base?

16. (a) Explain three types of actions to be taken for recovery from deadlock
    (b) Discuss about DDL and DML Commands briefly.

17. Write notes on
    (a) Lock-based Protocols
    (b) Discretionary access control

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# FACULTY OF ENGINEERING

**B. E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022**

**Subject: Disaster Mitigation**

**Open Elective – I**

Time: 3 Hours                                                    Max. Marks: 70

**(Missing data, if any, may be suitably assumed)**

**PART – A**

Note: Answer all questions.                            **(10 x 2 = 20 Marks)**

1. What is Risk?
2. Differentiate Hazard and Disaster.
3. Building Collapse is which type of disaster and how does it affect the environment.
4. Differentiate thunder storms and hail storms.
5. What is role of IDNDR in Disaster Management?
6. Name two basins in Indian that are frequently affected by flood and explain the warming dissemination system of India in the flood affected areas.
7. What is Disaster Management Act 2005?
8. State the significance of cyclone shelters.
9. What are the components of GIS?
10. How does remote sensing helps in disaster management?

**PART – B**

Note: Answer any five questions.                      **(5 x 10 = 50 Marks)**

11 (a) Explain the disaster management cycle.
   (b) Give a brief account of the impact of natural disasters on environment and development.
12 Explain in detail about Biological disasters and Technological disasters.
13 What are the activities performed during disaster and post disaster to reduce the effect of disaster.
14 (a) Discuss few mega disasters of India.
   (b) Briefly explain the role of Non Government and Inter Government Agencies in disaster Management.
15 Briefly explain the applications of Science and technology in disaster management.
16 (a) Write short notes on Earthquakes and Tsunamis.
   (b) Discuss the various structural and non-structural methods to control floods.
17 Write short notes on
   (a) Land Slides
   (b) Early warning System
   (c) Factors that contribute to risk.
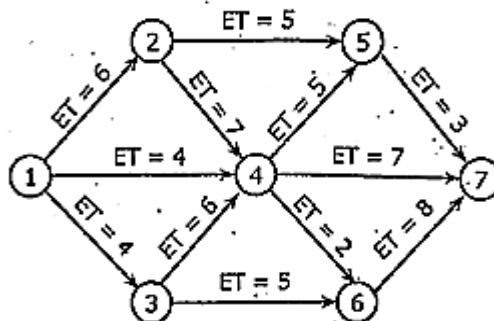
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# FACULTY OF ENGINEERING
**B.E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022**
**Subject: Entrepreneurship**
**Open Elective – I**

Time: 3 Hours                                                                 Max. Marks: 70
**(Missing data, if any, may be suitably assumed)**
## PART – A
**Note: Answer all questions.**                                    **(10 x 2 = 20 Marks)**

1. What is an enterprise?
2. What is the linkage between medium and heavy industries?
3. Who are first generation entrepreneurs?
4. Briefly discuss about Human aspects in project management?
5. What is a project in entrepreneurship?
6. What is social cost-benefit analysis?
7. What is meant by urgency addiction?
8. Mention the differences between CPM and PERT.
9. Write the major motives influencing entrepreneurs.
10. What is time in business and society?

## PART – B

**Note: Answer any five questions.**                              **(5 x 10 = 50 Marks)**

11. (a) Discuss the economic reforms of Indian Industrial environment.

    (b) Explain the competencies for entrepreneurial growth?

12. Discuss in detail the role and importance of Entrepreneurs in make in India policy.

13. (a) Explain the role of women in today's competitive world?

    (b) What should be values and attitudes of entrepreneur?

14. (a) Explain the various aspects of project formulation?

    (b) Consider the following PERT network and determine the critical path through network.

15. (a) Define an idea and explain the necessity to have new ideas in an entrepreneurial journey.

   (b) Explain the elements of project organization for successful implementation.

16. (a) "Entrepreneurship and innovation goes together "- Explain in detail.

   (b) Explain the various stages in personality development.

17. Write short notes on:-

   (a)  Assessment of tax burden.

   (b) Time management matrix.

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# FACULTY OF ENGINEERING

### B. E. VI – Semester (AICTE) (Backlog) Examination, March / April 2022

### Subject: Digital System Design Using HDL Verilog

### Open Elective – I

Time: 3 hours          Max. Marks: 70

*(Missing data, if any, may be suitably assumed)*

### PART – A

**Note: Answer all questions.**          **(10 x 2 = 20 Marks)**

1. Explain compiler directives used in Verilog.
2. Explain representation of numbers in Verilog.
3. Write the Verilog code for 2:1 MUX.
4. Explain loop statement used in Verilog.
5. Write the Verilog code for T flip flop in behavioral model.
6. Draw blocks of ASM chart.
7. Define transition and flow table in asynchronous sequential circuits.
8. Explain Meanly and Moore FSM model.
9. List various data types used in Verilog.
10. Draw simplified architecture of FPGA and CPLD with application.

### PART – B

**Note: Answer any five questions.**          **(5 x 10 = 50 Marks)**

11 (a) Write the Verilog code for full adder using gate level model.

     (b) Explain VLSI design flow.

12 (a) Differentiate between task and functions.

     (b) Design parity generator and write Verilog code.

13 (a) Write the Verilog code for mealy machine which detect a sequence 101.

     (b) Explain different shift registers.

14 Design ASM chart for binary multiplier and write the Verilog code.

15 (a) Implement the following Boolean function with a PLA.

     F1=AB'+AC+A'BC'

     F2=(AC+BC)'.

     (b) Implement following Boolean function using PROM

     $F1=\Sigma(1,2,4,7)$ $F2=\Sigma(3,5,6,7)$.

16 Design vending machine controller and implement its Verilog code.

17 Write a short note on

     (a) Sequential and parallel blocks

     (b) Programmable logic Devices.

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# FACULTY OF ENGINEERING
### B.E. VI - Semester (CBCS) (Backlog) Examination, March / April 2022
### Subject: Operating Systems
### Open Elective – I

**Time: 3 hours**                                            **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions**                                    **(10 x 2 = 20 Marks)**

1  List the differences between process and thread.
2  Explain critical section problem.
3  Define the following terms Throughput & Turnaround time
4  Explain the need for page-replacement.
5  Distinguish between semaphore and binary semaphore
6  Describe the representation of a resource-allocation graph.
7  What is fragmentation?
8  Discuss the drawbacks of contiguous allocation of disk space.
9  List the design goals of LINUX.
10 Write about Inter process Communication.

## PART – B

**Note: Answer any five questions**                                **(5 x 10 = 50 Marks)**

11 Explain the Readers and Writers problem and its solution using the concept of semaphores.

12 a)  Write the steps of banker's algorithm For deadlock avoidance
   b)  Consider the following snapshot of a system: Illustrate the system is in a safe state by demonstrating and order in which the processes may complete.

|      | Allocation ABCD | Max ABCD | Available ABCD |
|------|-----------------|----------|----------------|
| P0   | 2001            | 4212     | 3321           |
| P1   | 3121            | 5252     |                |
| P2   | 2103            | 2316     |                |
| P3   | 1312            | 1424     |                |
| P4   | 1432            | 3665     |                |

13 a)  Consider the following page reference string 7, 0, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1,2,0,1,74,0.
   Assuming three frames, how many page faults would occur in each of the following cases? (i) LRU (ii) FIFO. Note that initially all frames are empty.

14 a)  Explain the file allocation methods.
   b)  Write about the implementation of the Access Matrix.

15 a)  Explain the paging memory management technique.
   b)  Explain thrashing in detail with a suitable example.

16 a)  Draw the General architecture of Windows NT.
   b)  What are the different life systems supported by Linux?

17 Write about the following:
   a)  Deadlock Recovery.
   b)  Implementation of segmentation.

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# FACULTY OF ENGINEERING
## B.E. VI - Semester (CBCS) (Backlog) Examination, March / April 2022
### Subject: OOP Using Java
### Open Elective – I

**Time: 3 Hours** **Max. Marks: 70**

### (Missing data, if any, may be suitably assumed)
## PART – A

**Note: Answer all questions.** **(10 x 2 = 20 Marks)**

1. List out the various data types with their ranges.
2. Differentiate C++ and JAVA.
3. What is the use of Print Writer class?  List out its methods.
4. List the methods of File class.
5. What are the benefits of Buffered I/o classes?  Give example.
6. Differentiate between overloading and overriding
7. List and describe various data structures in JAVA.
8. Give the difference between vector and Array list classes.
9. What is the use of super keyword?
10. Write about character streams.

## PART – B

**Note: Answer any five questions.** **(5 x 10 = 50 Marks)**

11. a) Explain briefly about control statements.
    b) Differentiate between method overloading and overriding with an example.

12. a) Explain how to achieve synchronization using Multi-threading.
    b) Create a user defined package which contains methods to perform compare, add, and subtraction operations on a Two-dimensional array. Test the package from another class

13. a) Define interface? Give the differences between abstract classes & interfaces?
    b) Explain the usage of comparator with example.

14. a) Explain the steps involved in creation and handling of Menus.
    b) Write a program to display number of characters and words in a given file?

15. a) Explain the concept of Adapter class with an example.
    b) Explain about Byte stream and character stream classes.

16. a) Create a Student Registration form using various AWT Controls.
    b) Write a program to demonstrate Abstract classes and methods.

17. Write short notes on
    a) Nested try/block statements
    b) Legacy classes and interfaces
    c) final, finally and finalize keywords

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# FACULTY OF ENGINEERING

**B.E. VI - Semester (CBCS) (Backlog Examination, March / April 2022**
**Subject: Database System**
**Open Elective – I**

**Time: 3 Hours**                                                                      **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                                      **(10 x 2 = 20 Marks)**

1   What is meant by Relational Model?
2   What is candidate key?
3   Explain about relational algebra.
4   Define Recursion. Give example.
5   Write a small note on transaction management.
6   Define concurrency problem in DBMS.
7   What is meant by concurrency control?
8   Differentiate GraphDb and NoSQL.
9   What are the different advantages of distributed databases?
10  Define System Log with example.

## PART – B

**Note: Answer any five questions.**                                **(5 x 10 = 50 Marks)**

11  (a) Explain different types of cardinality relationship.
    (b) Explain the concept of Generalization and Specialization.

12  Differentiate relational algebra and relational calculus.

13  (a) Explain briefly Transactions in DBMS.
    (b) Write about concurrency control in DBMS.

14  Explain various types of Normal forms in detail with suitable examples.

15  (a) Illustrate different types of data fragmentation in distributed databases.
    (b) Explain Relational model with suitable examples.

16  Explain different methods of enforcing discretionary access control in databases systems by means of privileges.

17  Write notes on:
    (a) Graph database
    (b) Crash recovery.

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# FACULTY OF ENGINEERING
## B.E. VI - Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Principles of Embedded Systems
### Open Elective - I

**Time: 3 Hours**                                       **Max. Marks: 70**
### (Missing data, if any, may be suitably assumed)
### PART – A
**Note: Answer all questions.**                           **(10 x 2 = 20 Marks)**

1 Define Embedded system.
2 Compare and contrast round-robin and round-robin with interrupts.
3 Describe the goals of a typical testing process on the host machine.
4 What is the need for DMA?
5 What is the purpose of using a WAIT input signal in a Bus Cycle?
6 Distinguish between linker and locater in embedded system.
7 List different types of semaphore.
8 List the ways of selecting Architecture.
9 What are the different GATES? Draw the diagram for AND gates.
10 List the types of Buses.

### PART – B
**Note: Answer any five questions.**                     **(5 x 10 = 50 Marks)**

11 (a) Describe various design challenges of embedded system.
   (b) Explain the various characteristics of embedded computing application.

12 (a) Design a microprocessor system having 64KB memory addressing capability and connected to a ROM and a RAM each of 32KB capacity. The ROM address space begins from 0x0000 and RAM address space begins from 0x8000. Show the complete schematic of the system.
   (b) Describe the working of a UART using a neat block diagram.

13 (a) Compare the various software architectures with respect to priorities, worst response time for task code, stability of response and simplicity.
   (b) Explain the Function-Queue-Scheduling architecture with an example.

14 (a) What are the objections, limitations and shortcomings of testing embedded system code on the host system?
   (b) What is an in-circuit emulator? Describe its operation with a diagram.

15 What is semaphore? What are the problems which arise due to shared data and here the semaphore can be used to solve this problem? Explain with example.

16 (a) Explain the working of Assert Macro in detail.
   (b) Illustrate in detail the abilities of Instruction set simulators.

17 Write short notes on:
   (a) Shared data problem       (b)     ROM emulators
   (c) Timing Diagrams.

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# FACULTY OF ENGINEERING

**B.E. VI – Semester (CBCS) (Backlog) Examination, March / April 2022**
**Subject: Basics of Power Electronics**
**Open Elective - I**

Time: 3 Hours                                                             Max. Marks: 70

**(Missing data, if any, may be suitably assumed)**

**PART – A**

Note: Answer all questions.                                    **(10 x 2 = 20 Marks)**

1. Define depletion layer
2. Compare power BJT with power MOSFET
3. Draw the Symbol and structure of IGBT
4. Derive average load voltage and average load current of single – phase full wave rectifier with R load.
5. Draw output voltage and current waveforms of a single - phase half wave-controlled rectifier with RL load.
6. Define phase angle control.
7. What is SPWM?
8. Write the complete classification of convertors
9. What is AC voltage Regulator?
10. Write 4 applications of Voltage Controllers.

## PART - B

Note: Answers any five questions.                         **(5 x 10 = 50 Marks)**

11. Derive the relation between forward current gain and current gain of a BJT and explain how it operates like a switch.

12  a) Explain the working of gate drive circuits for MOSFET with neat diagram.
    b) Explain resistance firing of SCR.

13. With neat waveforms and circuit diagram explain the operation of full wave-controlled rectifier with freewheeling diode.

14 a) Derive the output voltage of Buck-Boost Chopper.
    b) A step-down DC chopper has resistive load of R=15$\Omega$ and input voltage V$_{DC}$= 200 volts. The ON state voltage drop of the chopper is 2.5 Volts, chopping frequency is 1 KHz. If duty cycle is 50% find (i) Average output voltage (ii) RMS output voltage (iii) Chopper efficiency.

15. Explain the 120 degrees mode operation of 3 phase bridge inverter with neat diagrams.

16. A3 phase fully controlled bridge rectifier is supplied at 230 volts per phase and at a frequency of 50Hz. The source inductance Ls.= 5 mH and the load current on the de side is constant at 12 amps. If the load consists of dc source voltage of 230 Volts having an internal resistance of 2$\Omega$. Find (i) Firing angle 'α' (ii) Overlap angle 'β'.

17. Write a short note on the following (i) Multilevel inverters   (ii) Class E Chopper.

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# FACULTY OF ENGINEERING

BE VI –Semester (CBCS) (Backlog) Examination, March / April 2022
**Subject: Industrial Robotics**
**Open Elective – I**

**Time: 3 Hours**                **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**           **(10 x 2 = 20 Marks)**

1. Define Degrees of freedom of a robot

2. What is screw transformation?

3. Define dynamic behaviour

4. Differentiate between Accuracy and Repeatability of a robot.

5. Define singularity.

6. Explain the working principle of an Hall effect sensor.

7. Define Trajectory planning.

8. Define Robot Vision. Write the purpose of Image processing stage.

9. List different types of motion commands.

10. Explain various lightening techniques used in machine vision.

## PART - B

**Note: Answers any five questions.**       **(5 x 10 = 50 Marks)**

11. Explain Cartesian and Cylindrical robot manipulator configurations and its applications with the help of a neat sketch.

12. a) Explain the use of sensors in robots.
    b) Explain different types of position an Range sensors used in robots.

13. a) What is SCARA robot configuration and explain its applications?
    b) Explain the robotic applications in material handling and inspection.

14. a) Compare the Lagrange-Euler and Newton-Euler formulations.
    b) Explain Inertia Tensor.

15. Describe briefly energy management strategies?

16. With the help of neat sketches explain any two proximity sensors.

17. Write short notes on:
    a) D-H convention
    b) Laws of robotics

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# FACULTY OF ENGINEERING
### B.E VI –Semester (CBCS) (Backlog) Examination, March / April 2022
### Subject: Material Handling
### Open Elective – I

**Time: 3 Hours** **Max. Marks: 70**
### (Missing data, if any, may be suitably assumed)
### PART – A

**Note: Answer all questions.** **(10 x 2 = 20 Marks)**

1. Identify the difficulties in Manual Handling.
2. State the working principle of Screw Conveyor, Why it is used?
3. Differentiate between Fans and Blowers.
4. Write the applications of Vacuum Pump?
5. Define the terms Voidage and Bulk Density.
6. What is meant by AGV? Where it is used?
7. What is ASRS and State the merits of ASRS?
8. Enumerate the principles of Material Handling.
9. State the working of a Screw feeder with neat sketch.
10. Write a short notes on Single-command cycle.

### PART – B

**Note: Answer any five questions.** **(5 x 10 = 50 Marks)**

11. Classify different types of Material Handling equipment and explain each of these with neat sketch.

12. (a) Discuss the working principle & applications of a Bucket Elevator with a neat sketch.
    (b) Compare Hydraulic and Pneumatic conveyor.

13. Explain the guiding factors determining the functioning of the AGVS.

14. (a) Explain the components of Hydraulic Conveying Systems.
    (b) Explain the working principle of a Reciprocating Air Compressor.

15. Explain the fundamentals of RFID system and their integration with computer base information system.

16. Explain the Modes of Flow for Hoppers and Bins with a neat sketches.

17. Write short notes on:
    (a) Vibratory conveyor.
    (b) Cranes and Hoists.
    (c) Screw Compressors.

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# FACULTY OF ENGINEERING

**BE VI - Semester (CBCS) (Backlog) Examination, March / April 2022**
**Subject: Disaster Management**
**Open Elective – I**

**Time: 3 Hours**                                          **Max marks: 70**

**(Missing data, if any may be suitably assumed)**

## PART – A

**Note**: **Answer all questions**.                          **(10 x 2 = 20 Marks)**

1. Define Vulnerability and Resilience
2. Define drought. What are its causes?
3. Explain briefly on 'Heat Waves' and 'Cold Waves'.
4. Write briefly on 'Pandemic' and epidemic
5. Write short notes on Disaster management cycle
6. Explain the role of ULB in disaster risk reduction
7. What is the impact of an embankment construction of flood management
8. Explain two factors affecting vulnerability in disaster management
9. Write a short note on Hazard and Vulnerability profile of India
10. List few salient features of DM Act and Policy

## PART - B

**Note: Answers any five questions**.                     **(5 x 10 = 50 Marks)**

11. a) Explain the types of drought and describe its social and economic impact
     b) Define disaster, risk and hazard. How is hazard different from disaster?

12. a) Discuss the classification of disaster. Explain the political and health impact of disaster.
     b) What do you mean by differential impacts of disaster? How it affects the various sections of society?

13. a) How climate charge might increase case of floods and droughts. Discuss its possible implications.
     b) Explain the role played by the community in Disaster Risk reduction

14. a) Discuss the differential impacts and explain the interrelationship between disaster and development.
     b) Explain the usage of indigenous knowledge and technologies in disaster management

15. a) Describe the hazard and vulnerability profile of India.
     b) Write short notes on Disaster Risk Management in India. Explain 'Culture of Safety'.

16. a) Discuss health and waste management as components in disaster management.
     b) Write relevant notes on Landslides and the preventive measures.

17. a) Explain the destruction caused by different disasters and how DRR helps in its mitigation
     b) Write about the global trends in disaster.

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# FACULTY OF ENGINEERING
**B.E. III / IV (Civil) II – Semester (NON-CBCS) (Backlog) Examination,**
**March / April 2022**
**Subject: Environmental Engineering**

**Time: 3 Hours**                                                    **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                                    **(25 Marks)**

1. Estimate the quantity of storm water for an area of 10 hectares using Rational method.
2. Write about coagulation and flocculation.
3. State hydraulic formulae that are commonly adopted in the design of sewers.
4. What are Rapid sand filters.
5. Discuss the role of secondary settling tank in activated sludge process.
6. Discuss briefly the importance of treating water for public supply.
7. Mention merits and demerits of Pressure filters.
8. Classify Solid waste giving suitable example of each.
9. What are oxidation ponds.
10. What is the need for low-cost water treatment?

## PART – B

**Note: Answer any five questions.**                        **(5 x 10 = 50 Marks)**

11. (a) Explain the water distribution systems and solution of a simple network using Hardy cross method.
    (b) Forecast the population of a locality obtained from census report is as follows:

| Census Year | 1881 | 1891 | 1901 | 1911 | 1921 | 1931 | 1941 | 1951 | 1961 |
|---|---|---|---|---|---|---|---|---|---|
| Population | 8000 | 12000 | 17000 | 22500 | 29000 | 37500 | 47000 | 57000 | 66500 |

Estimate the population for year 2041.

12. (a) Design a slow sand filter to treat 5 MLD. Also provide sand specification in terms of effective size and uniformity coefficient.
    (b) With a neat sketch, explain the basic mechanism of BOD removal in Trickling filter. Mention two modifications in trickling filters with flow-diagrams.

13. (a) Discuss in detail various types of Sewers and its appurtenances.
    (b) Design a septic tank for 300 people. Assume suitable data.

14. (a) A Sewer, having diameter 1.20m, is laid at a gradient of 1 in 400, calculate the velocity of flow and discharge through this sewer when running one-half full. Assume N=0.012 in Manning's formula.
    (b) Discuss primary treatment of waste water through Sedimentation tank.

**..2..**

15. (a) Write short note on collection and recovery of refuse. What are the different methods of disposal of solid refuse?
    (b) What do you understand by Disinfections? Discuss in detail break point chlorination.

16. (a) Mention steps in sludge handling and discuss in detail the process in Anaerobic digester.
    (b) Discuss the transportation and disposal of Solid waste.

17. Write short notes on any **TWO** of the following.
    (a) Infiltration pipes.
    (b) Ozone and U-V radiation.
    (c) Sludge digestion.

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# FACULTY OF ENGINEERING

**B.E. III / IV (Civil) II – Semester (NON-CBCS) (Backlog) Examination,**
**March / April 2022**
**Subject: Water and Waste water Engineering**

**Time: 3 Hours**                                                               **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                                          **(25 Marks)**

1. Discuss briefly the importance of treating water for public supply.
2. Write about breakpoint chlorination.
3. State hydraulic formulae that are commonly adopted in the design of sewers.
4. What is "Design period"? Mention design period for various components in a water supply scheme.
5. Explain the functioning of septic tank with a sketch.
6. Discuss the role of secondary settling tank in activated sludge process.
7. Estimate the quantity of storm water for an area of 10 hectares using Rational method.
8. Discuss self-purification process of water bodies like rivers.
9. Classify solid waste giving suitable example of each.
10. What do you understand by preliminary treatment of sewage?

## PART – B

**Note: Answer any five questions.**                          **(5 x 10 = 50 Marks)**

11. (a) Explain the water distribution systems and solution of a simple network using Hardy cross method.

    (b) The population of a locality as obtained from census report is as follows: Estimate the population for year 2031.

| Census year | 1881 | 1891 | 1901 | 1911 | 1921 | 1931 | 1941 | 1951 | 1961 |
|---|---|---|---|---|---|---|---|---|---|
| Population | 8000 | 12000 | 17000 | 22500 | 29000 | 37500 | 47000 | 57000 | 66500 |

12. (a) Draw the cross section of SSF, name different components and discuss the operation of SSF.
    (b) Design a septic tank for 50 users, assuming the rate of water supply as 60 litres/head/day.

13. (a) Design a low rate trickling filter to treat 5 MLD of sewage with a $BOD_5$ @ 20°C is 200 mg/$l$.
    (b) With a neat sketch, explain the basic mechanism of BOD removal in Trickling filter. Mention two modifications in trickling filters with flow-diagrams.

14. (a) Design the sedimentation tank of a water works to treat the water per day. Assume the velocity of flow in the sedimentation tank as 20 cm/minute and the detention period is 11 hours.
    (b) What are the merits and demerits of the rapid sand filters as compared with the slow sand filters?

15. (a) A sewer, having diameter 1.20m, is laid at a gradient of 1 in 400, calculate the velocity of flow and discharge through this sewer when running one-half full. Assume N = 0.012 in Manning's formula.

   (b) Determine the velocity of flow by Empirical formulae. What points should be kept in mind while designing sewers? Explain in detail various steps involved in the design.

16. (a) Design a secondary settling tank for an activated sludge process with the following design data.

   Average sewage flow = 9 MLD
   MLSS concentration = 300 mg / lt.
   Peak flow factor = 2.25
   Recycle rate = 30%

   (b) Describe briefly about the preliminary treatment using screens.

17. Write short notes on any **TWO** of the following:
   (a) Sludge digestion and disposal methods.
   (b) Break point chlorination.
   (c) Sewer types and appurtenances.

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# FACULTY OF ENGINEERING
### B.E III / IV (EIE) II – Semester (NON-CBCS) (Backlog) Examination, March / April 2022
### Subject: Biomedical Instrumentation

**Time: 3 Hours**                                                                 **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**
### PART – A

**Note: Answer all questions.**                                          **(25 Marks)**

1.   Mention the general characteristics of Biomedical Instrument devices.

2.   Define Bio-potential.

3.   State desirable features of inkjet recorder.

4.   What is ventricular fibrillation?

5.   Draw the block diagram of Electromyograph.

6.   Define the various heart sounds in a Phonocardiogram.

7.   What are the properties of X-rays?

8.   List any four applications of Laser in industrial field.

9.   What is meant by Medical imaging?

10.  Define Threshold.

### PART – B

**Note: Answer any five questions.**                          **(5 x 10 = 50 Marks)**

11.  Explain 10-20 electrode system in EEG.

12.  Explain in detail natural pace maker.

13.  Explain the operating principle with the block diagram of ECG Machine
     Mention the special types of ECG recorders with suitable diagram.

14.  Describe in detail the electrical factors governing the hospital design.

15.  Explain Microshock and Macroshock in detail and their effect on physiological
     behavior of the patient.

16   Explain about collimators and grids.

17.  Explain a short note on:
     (a) MRI
     (b) Phonocardiograph.

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# FACULTY OF ENGINEERING
### B.E. III / IV (MECH) II - Semester (NON-CBCS) (Backlog) Examination, March / April 2022
### Subject: Control Systems Theory

**Time: 3 hours**          **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**          **(25 Marks)**

1. Define open loop and Closed Loop control systems.
2. Define the terms – Time constant, Hydraulic resistance.
3. Explain the effect of feedback on stability of control system.
4. Sketch the polar plot of G(s) = $\frac{e^{-st}}{1+st}$.
5. For the system G(s) = $\frac{9}{(s^2 + 2s + 9)}$. What is the steady state error for ramp input?
6. Determine the range of 'k' for the system to be stable $s^3+3s^2+(k+2)s+5k$.
7. If A = $\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$ find φ (t).
8. Briefly explain the importance of PID controller.
9. What are the advantage of state space analysis?
10. Define gain margin and phase margin.

## PART – B

**Note: Answer any five questions.**          **(5 x 10 = 50 Marks)**

11. Write the differential equations governing the mechanical system shown figure. Also draw F-V and F-I analogous circuits.
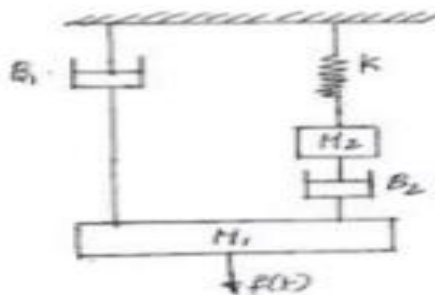


12. Solve the given block diagram using reduction technique and verify the result by using Mason's gain formula.
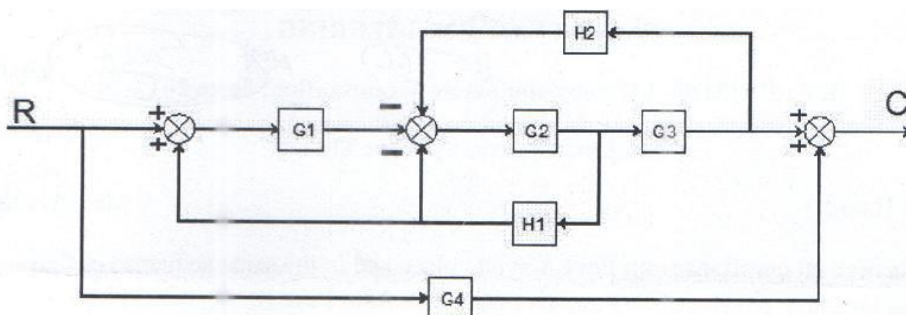
13. Sketch the root locus and determine the range of K for stability of a system given

by $G(s) H(s) = \frac{K(1+0.1s)}{s(1+.25s)(1+0.01s)}$.

14. Sketch the bode plot and hence find Gain cross over frequency, phase cross over frequency, Gain margin and phase margin , $G(s) = \frac{0.75(1+0.2s)}{s(1+0.5s)(1+0.1s)}$.

15. Sketch the Nyquist plot and find the stability of closed loop system, whose open loop transfer function $G(s) = \frac{ks}{s^2+2s+11}$.

16. a) Explain about Time domain specifications of II order under damped system.
    b) Explain about PID controller.

17. Check the controllability and observability of a unity feedback system represented

by $G(s) = \frac{5s^2+15s+35}{s^3+ 4s^2+14s+20}$.

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# FACULTY OF ENGINEERING

**B.E. III / IV (CSE) II - Semester (NON-CBCS) (Backlog) Examination,**
**March / April 2022**

**Subject: Principles of Programming Languages**

**Time: 3 hours**            **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**          **(25 Marks)**

1. Give example of each of the following errors using any programming language of your choice
   i) Lexical error           ii) static semantic error
2. Why are scripting languages interpreted rather than compiled?
3. Define referencing environment.
4. What is the difference between value model of variables and reference model of variables?
5. Distinguish between the terms name equivalence and structural equivalence
6. How does an inline subroutine differ from macro?
7. How do inner classes in Java differ from nested classes?
8. Why don't message-passing programs require explicit synchronization mechanisms?
9. What is memoziation?
10. Why unification is important in logic programming?

## PART – B

**Note: Answer any five questions.**          **(5 x 10 = 50 Marks)**

11. a) What are different tools that you come across in programming environment? Give examples of these tools in Unix environment.
    b) (i) Write a grammar for the language over the alphabet {a, b} consisting of strings that read the same backward or forward (Palindromes). For example the strings a, aa, aba, abba, baab, abaaba are all in the language but the strings abb, ab, aabb are not
       (ii) Draw parse trees for : **abaaaba** using the above grammar

12. a) Briefly explain different storage allocation mechanisms
    b) What are different types of logically controlled loops? Illustrate with examples

13. a) Explain mark and sweep garbage collection mechanism.
    b) Consider the following program written in C syntax:
```
void swap (int a, int b)
{
Int temp;
temp=a;
a = b;
b = temp;
}
Void main ()
{
int value =2, list [5] = {1, 3, 5, 7, 9};
```

swap (value, list [0]);

swap (list [0], list [1]);

swap (value, list[value]);

}

For each of the following parameter-passing methods, what are all of the values of the variables **value** and **list** each of the three calls to swap?

   i)  Passed by value    ii) Passed  by reference   iii) Passed by value-result

14. a) Explain in the importance of virtual methods for object closures
    b) Describe different mechanisms commonly used to create new threads of control in concurrent program

15. a) What is the difference between normal-order and applicative – order evaluation? What is lazy evaluation? Illustrate with examples.
    b) Briefly describe the process of resolution in logic programming.

16. a) What is dynamic scoping? What are it's advantages? Describe how similar benefits can be achieved in a language without dynamic scoping.
    b) What is type inference? Describe three contexts in which it occurs.

17. a) Describe three common mechanisms for specifying the return value of a function. What are their relative strengths and drawbacks?
    b) Describe different implementation strategies of symbolic debugger.

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