FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Old) Examination, October/November 2020

Subject: Water and Waste Water Engineering

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. Define per capita demand. What are the factors affecting per capita demand.
2. What is the purpose of flocculation.
3. Write a short note on various methods of estimating fire demand.
4. List out four coagulants used in treatment of water.
5. What are the two types of sewage system? Explain in brief.
6. List out various sewer appurtenances.
7. Mention the classification of treatment process of sewage.
8. What are the operational troubles in trickling filters?
9. Define sludge digestion. What are the stages in sludge digestion process?
10. Define Incineration and Pyrolysis.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. (a) Explain in brief different water distribution networks.

   (b) The following is the population data of a city, available from past census records. Determine the population of the city in 2011 by

   a) Arithematic Increase Method

   b) Geometrical increase method.

Year	1931	1941	1951	1961	1971	1981	1991
Population	12000	16500	26800	41500	57500	68000	74100

12. (a) Distinguish between rapid sand filters and slow sand filters.

   (b) Explain the process of coagulation and flocculation in sedimentation tank.

13. (a) Explain in detail about self-purification of streams.

   (b) Explain oxygen-sag curve with neat sketch.

14. (a) Explain the operational principle of Activated sludge process.

   (b) Write short notes on preliminary treatment of waste water.

15. (a) Explain briefly about various methods of solid waste collection.

    (b) Write short notes on sludge disposal methods.

16. (a) Write short notes on theory of filtration.

    (b) Explain operational process of infiltration galleries.

17. (a) For a waste-water sample, 5-day BOD at 20°C is 400 mg 1l and is 50% of the

    ultimate. What will be 7 day BOD at 40°C?

    (b) Write a short notes on operational principle of oxidation ponds.

* * *

FACULTY OF ENGINEERING

BE 3/4 (Civil) II – Semester (Backlog) Examination, October/November 2020

Subject: Environmental Engineering

Time: 2 Hours   Max.Marks:75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. What are joints? Write its requirement.
2. Explain the factors affecting the population forecast.
3. What is hardness of water? How can it be removed?
4. Explain the mechanism of backwashing of filters.
5. Write the different empirical formulae for the sewage quantity estimation.
6. Define limiting velocity in sewers.
7. Find the ultimate BOD for a sewage with 3 day BOD at 30^0 C as 180 mg/l, taking k = 0.1
8. What are the points to be considered in sewage treatment design?
9. State your understanding on sludge volume index?
10. Compare the function and performance of septic tank with that of inhoff tank.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. (a) What are intakes? List the different types of intakes and explain any one with diagram.
    (b) The population of a city for three decades i.e. 1980, 1990 and 2000 is 40 thousand, 90 thousand and 1.5 lakhs respectively. Find the population of the city for the year 2010 using geometrical increase method.

12. (a) Design set of five slow sand filter beds for a population of 90,000 with the per capita demand 150 litres/day and rate of filtration as 180 litres/hr/Sq.m. Take the length as twice the breadth.
    (b) Write short notes on rectangular and hooper bottom sedimentation tanks.

13. (a) A sewer having diameter 1.2 m is laid at a gradient of 1 in 400. Calculate the velocity of flow and discharge through this sewer when running half full. Assume N=0.012 in Manning's formula.
    (b) Explain in detail the self purification of streams.

14. Design a circular sewage sedimentation tank for a town having population of 1 lakh. The average water demand is 140 litres/ capita /day. Assume that 80% water reaches at the treatment unit and the maximum demand is 2 times the average demand.

15. (a) With a neat sketch explain the working and construction of oxidation ponds.
    (b) Explain the process of anaerobic sludge digestion.

16 (a) What are sewer appurtenances? Discuss about the important sewer Appurtenances?
    (b) Write short notes on slow sand filters and rapid sand filters.

17. Write short notes on
    (a) Types of Screens.
    (b) Sludge Digestion Tank.
    (c) Chlorination of Water.

****

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) II-Semester (Backlog) Examination, October/November 2020

Subject : Biomedical Instrumentation

Time : 2 hours   **Max. Marks :75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1   List any three characteristics of any medical instrumentation system.

2   Define linearity of biomedical instrument.

3   Explain briefly the origin of first and second heart sounds.

4   Define Tachycardia and Bradycardia.

5   What is the cause of hear murmurs?

6   Define and explain Korotkoff sound.

7   Write at least two applications of CO_2 laser in medical field.

8   What is Bremsstrahlung X-ray radiation?

9   Define leakage current.

10 Define Let Go Current.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 Explain in detail optical recorder with neat diagram.

12 a) Explain in detail mechanical conduction of hear with neat diagram.
     b) Explain how noise problems are eliminated in ECG recording.

13 a) Explain catheterization method for measurement of BP.
     b) Discuss about amplifers and filters used in phonocardiography.

14 Write a short note on:
     a) Holter monitoring
     b) Echocardigraphy

15 a) Explain briefly types of leakage currents.
     b) What do you mean by threshold of perception? Define ventricular fibrillation.

16 a) Differentiate between X-rays and Fluoroscopy.
     b) Explain resting rhythms of EEG.

17 a) Write advantages and disadvantages of CT scan.
     b) Explain in detail electrocardiograph.

****

FACULTY OF ENGINEERING

BE 3/4 II-Semester (Old)(ECE) Examination, October/November 2020

Subject: Electronic Instrumentation

Time: 2 Hours   Max. Marks :75

PART –A

Note : Answer any Seven Questions   **(7x3=21 Marks)**

1. When do you say a particular instrument is more sensitive than the other
2. In what way ISO 9001 Certification is helpful and explain about it
3. Which transducer is used for measurement of radioactivity and explain the principle involved in it
4. How different is active transducer from the passive transducer
5. What is basic principle involved in aluminum oxide hygrometer
6. Compare Crystal and resistive hygrometers
7. What Parameters can be measured using Digital LCR meters
8. What do you understand by 'SCADA' Explain its applications.
9. Explain briefly about 'Biopotential recorder.
10. What are the features of 'Biopotential electrodes.

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. Define the terms accuracy, Precision, Resolution and Sensitivity. Also, explain about various standards in detail.

12. a) Derive the expression for strain gauge of a strain gauge
    b) Explain how LVDT can be used for displacement measurement

13. List out different type of Microphones and explain in detail about any two of them.

14. Draw the block diagram of the delayed time base Oscilloscope. Also give its applications and limitations

15. Discuss in detail about
    i) Magnetic resonance and imaging systems and
    ii) Ultrasonic imaging systems

16. a) Draw the diagram of photo conductive transducer and explain its operation
    b) Discuss in detail about resistance wire thermometers

17. Write short notes on
    a) Data acquisition system
    b) EMG

****

FACULTY OF ENGINEERING

BE 3/4 (Mech.) II-Semester (Backlog) Examination, October/November 2020

Subject: Control Systems Theory

Time : 2 Hours   Max. Marks: 75

PART – A

**Note: Answer any seven questions.**   **(7x3 = 21 Marks)**

1   Sketch a block diagram of an air-conditioning system of a car where the person sets the desired interior temperature on a dashboard panel.
2   Mention the applications of AC – DC servomotors.
3   What is Mason's gain formula?

4   For the system $G(s) = \dfrac{9}{(s^2 + 2s + 2s + 9)}$, what is the steady state error for ramp input?

5   State Nyquist stability criterion.
6   Define the terms 'Gain Margin' and 'Phase Margin'.
7   Write about Lag Compensator.
8   Explain the Linearization of the non linear systems.

9   If $A = \begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix}$, find e^{At}.

10 What are the advantages of stage space analysis over classical control systems?
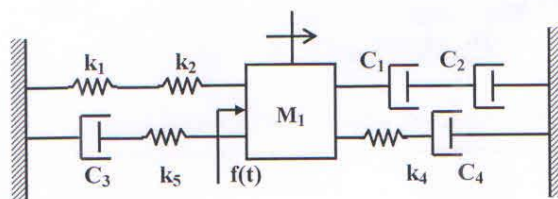
PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) Determine the overall transfer function C(S)/R(S) for the system shown in fig. below.
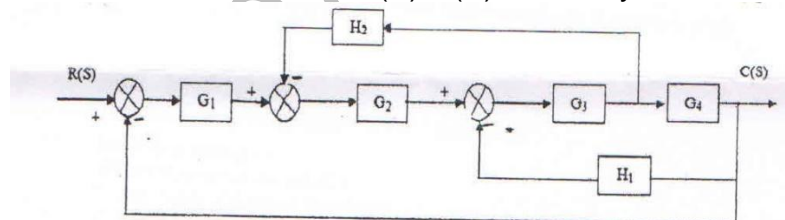
   (b) Derive the differential equations for the system given below.

12 Sketch the complete root locus for the characteristics equation given by
    F(s) =s³ + 3s² + (k + 2)s + 5k = 0.

13   Sketch the Bode plot and hence find gain cross over frequency, phase cross over frequency, Gain margin and phase margin for a system represented by unity feedback system

$$G(s) = \frac{0.75\,(1 + 0.2\,s)}{s(1 + 0.5\,s)(1 + 0.1s)}$$

14 Construct Routh array and determine the stability of the system whose characteristic equation is $s^5 + s^4 + 2s^3 + 3s + 5 = 0$.

15 (a) Determine the state variable representation of the system whose transfer function is given
as $\dfrac{Y(s)}{U(s)} = \dfrac{2s^2 + 8s + 7)}{(s + 2)^2(s + 1)}$.

(b) Test the controllability and observability of the system whose state space representation is given as

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix}\begin{bmatrix} U_1 \\ U_2 \end{bmatrix}$$

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

16 Consider a unity feedback system, whose open loop transfer functions is given by

$$G(s) = \frac{0.4s + 1}{s(s + 0.6)}$$

Obtain the response to step input, for the same, calculate the rise time, maximum peak overshoot, peak time and settling time.

17 Write short notes on the following:
(a) Routh's criterion for stability
(b) Importance of Laplace Transform
(c) Relation between time response and frequency response technique

*****

FACULTY OF ENGINEERING

B.E. 3/4 II – Semester (AE) (Backlog) Examination, October/November 2020

Subject: Automotive Air Conditioning

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. Define (a) Wet bulb temperature (b) Humidity ratio
2. Draw the layout of Psychometric chart.
3. What is bypass factor.
4. Define room sensible heat factor (RSHF)
5. Draw layout diagram of basic refrigeration system.
6. What are the parts of compressor.
7. Classify refrigerants.
8. What are substitutes of CFC refrigerants.
9. What are objectives of an air routing in automobile air conditioning system.
10. Give any three steps of maintenance of air conditioner.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. (a) Represent the following process on a layout of psychometric chart.
    (i) Heating and humidification
    (ii) Cooling and dehumidification
    (b) What is adiabatic dehumidification.

12. (a) Explain the working of year round air conditioning system.
    (b) What are the various load parameters to be considered for heat load calculations.

13. (a) Explain the functioning of evaporative temperature regulator.
    (b) Explain the process of calibration of expansion valve.

14. (a) How automatic temperature control is obtained in automobiles.
    (b) What are the devices used for air conditioning protection.

15. (a) How duct system is working for an automobile.
    (b) Give the step wise trouble shooting of air conditioning system.

16. (a) Explain the process of mixing of air streams.
    (b) Show GSHF line on layout of psychrometric chart.

17. (a) Explain Ford automatically controlled air conditioner.
    (b) How the servicing of heater system is done.

* * *

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II-Semester (OLD) Examination, October/November 2020

Subject : Principles of Programming Languages

Time: 2 Hours   **Max. Marks :75**

PART –A

Note : Answer any Seven Questions   **(7x3=21 Marks)**

1. What is the difference between syntax and semantics?

2. What are dangling pointers?

3. Write the difference types equivalence and type compatibility?

4. Distinguish between private, protected and public access specifiers in C++

5. Define dynamic binding?

6. What is short – circuit Boolean evaluation?

7. Explain Non- determinancy

8. What are Records (structures) and Varients (unions)?

9. Explain data structure in prolog

10. Write the structure of lists. Give example

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. a) Explain Backus norm form grammar and its significance.
    b) Write the difference between compiler and interpreter.

12. Explain briefly :
    a) Context-free grammar   b) Parsing

13. How are parameter passing methods implemented in various languages?

14. a) What are recursive types?
    b) Explain concurrency mechanism in Ada?

15. Explain the concept of inheritance with example?

16. a) Explain Logic programming language features
    b) Write about scheme programming language

17. Write notes on
    a) Pointers   b) Polymorphism

****

FACULTY OF ENGINEERING
B.E. 3/4 (I.T.) II - Semester (Old) Examination, October/November 2020

Subject : Dataware Ware Housing & Data Mining (Elective – I)

Time : 2 Hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 Do you think that data mining is also the result of the machine learning research?
2 How is data warehouse different from a database?
3 Discuss the role of data mining in data warehousing.
4 Mention various kinds of Association rules.
5 Define precisions and recall classification and give their formulae.
6 Define ensemble.
7 Discuss briefly on web usage mining.
8 List the major tasks for clustering evaluation.
9 What is the underlying principle of the Hidden web?
10 What is page rank? How is it computer?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) What is clustering of data? Distinguish supervised and unsupervised classification.
    (b) Discuss the issues to consider during data integration.

12 (a) Give a short example to show that items in a strong association rule actually may be negatively correlated.
    (b) Describe situations where the query-driven approach is preferable to the update. Discuss approach.

13 (a) What is boosting ? State why it may improve the accuracy of decision tree induction.
    (b) Briefly outline the major steps of decision tree classification.

14 (a) Discuss the challenges of outlier detection.
    (b) Using an equal depth histogram, design a way to assign an object an outlier score.

15 How is test mining related to web mining? What are the techniques of text mining?

16 (a) Define a FP-tree. Discuss the method of computing a FP tree.
    (b) How do you extract structures from unstructured text data? What features are extracted in this process.

17 Explain the difference and similarity between discrimination and classification and characterization and clustering.

*****

FACULTY OF ENGINEERING
B.E. (IT) 3/4 II-Semester (Backlog) Examination, October/November 2020

Subject : Software Testing

Time : 2 Hours   Max. Marks: 70

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**
1 Specify the Goals of Software Testing.
2 What are the factors for determining the limit of testing?
3 What is the need of White-Box Testing?
4 Differentiate Progressive Vs. Regressive Testing.
5 Write the formula of Cyclomatic Complexity.
6 How do you measure the Effectiveness of a Prioritized Test Suite?
7 Mention Challenges in Testing for Web-based software.
8 What are the debugging Techniques?
9 List out the testing tools used.
10 What is Silk Test?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**
11 (a) What are the software testing methodology? Explain in detail with example.
   (b) How does verification of High-level Design happen?

12 (a) Define the following terms: Unit testing and System Testing. What are the
       methods followed in Unit testing.
   (b) Explain Logic Coverage Criteria in white box testing.

13 (a) Describe Classification of Software Metrics.
   (b) Write about Estimation models for Estimating Testing Efforts.

14 (a) Define Object-oriented Testing and explain with example.
   (b) Mention the Quality Aspects in software testing.

15 (a) How does load runner work? Explain with example.
   (b) Give an example for test script. Explain in detail.

16 When is Regression Testing Done? Explain Regression Testing Types.

17 (a) Explain the components of test planning.
   (b) What are the benefits of test suite?

*****

FACULTY OF ENGINEERING

B.E. 3/4 (IT) II - Semester (New) (Backlog) Examination, October/November 2020

Subject : Software Testing (Elective-I)

Time: 2 Hours   **Max. Marks :75**

PART –A

Note : Answer any Seven Questions   **(7x3=21 Marks)**

1. Define Error, Bug and Failure.

2. What is validation.

3. List elements of State Table based Testing.

4. What is the use of Black box testing.

5. Write the different software quality metrics.

6. What is a Test suite.

7. List issues in Inheritance testing.

8. What is conceptual modeling.

9. Write the advantages of automated testing tools.

10. What is load testing.

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. Explain the importance of Requirements Traceability Matrix.

12. a) Write differences between inspection and walkthrough.
    b) How do you calculate cyclomatic complexity of a code segment.

13. Explain the techniques for efficient test suite management.

14. a) Describe the process of testing Web based Systems.
    b)   What is Web Engineering.

15. a) Describe Load Runner- its components and working.
    b) Explain the taxonomy of automated testing tools.

16. a) Give details on application of Boundary value analysis.
    b) Explain different types of integration testing.

17. Write briefly about :
    a) Static and Dynamic testing.
    b) JMeter.

******

FACULTY OF ENGINEERING

B.E. (CSE) VI – Semester (CBCS) (Suppl.) Examination, October/November 2020

Subject: Operating Systems (Elective – B)

Time: 2 Hours   **Max.Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Differentiate between process and thread.
2. Draw the process state transition diagram.
3. What is race condition? Explain with example.
4. State the necessary conditions for the deadlock to occur.
5. What are the causes for Thrashing?
6. Define seek time and rotational time.
7. What is Compaction technique?
8. Why file name extensions are used?
9. Write the differences between capability lists and access lists
10. List the design goals of LINUX.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. Consider the following set of process.

Process	Burst time	Priority	Arrival time
P1	10	3	0
P2	3	2	2
P3	1	1	1
P4	5	4	1
P5	7	2	1

i) Draw the Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority), and RR (quantum = 2).

ii) Calculate the turn around time and waiting time of each of the process for each of the algorithm.

12. (a) Explain the paging memory management technique.
    (b) Explain the different directory implementation methods.

13. Consider the following snapshot of a system Answer the following questions using the banker's algorithm:

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
Po	0	0	1	3	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				

a) What is the content of matrix "Need"?
b) Is the system in a safe state?
c) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?

14. Consider the following page-reference string
7,0,2,1,3,4,2,1,0,2,1,4,3,2,1,0,0,1,2,1.
Calculate the number of page faults that would occur for the following algorithms assuming frame size as 3.

FIFO   Optimal   LRU   MRU   LFU   MFU

15. Consider that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms?
FCFS   SSTF SCAN   C-SCAN   LOOK   C-LOOK

16. Explain the process management in LINUX

17. Write short notes on any two:
    a) Encryption
    b) Inter process management
    c) Inverted paging.

****

FACULTY OF ENGINEERING
BE VI-Semester (CBCS) (Backlog) Examination, October/November 2019

Subject: OOP Using Java (Elective – I)

Time : 2 Hours   **Max. Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 What is difference between Differentiate class and abstract class.
2 Define polymorphism.
3 List out various methods to import User-Defined packages.
4 How to cast incompatible types ? Give an example.
5 Define Thread.
6 What is the use of 'this' keyword?
7 Why string class is called immutable?
8 What is the use of String Tokenizer?
9 Differentiate Text area and Text Field.
10 Differentiate between Byte stream and Character stream.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Briefly discuss about different types of variables with suitable examples.
   (b) Explain different data types used in java .

12 (a) What is interface? How to create it and access it? Explain with example.
   (b) Describe the concept of thread synchronization .

13 (a) Write a java program to read n integers from console and print the sum
       of n integers.
   (b) What is a nested class? Differentiate between static nested classes and non-
       static nested classes

14 (a) Explain the different iterators used for accessing the elements with example
   (b) Explain map interface with suitable example.

15 (a) Describe about various components in AWT.
   (b) Write an java program to handle all mouse events.

16 Explain the concepts of Serialization and Deserialization with suitable examples.

17 Write short notes on the following
   (a) Buffered Reader class
   (b) Static methods in java
   (c) paint() and repaint()

*****

FACULTY OF ENGINEERING

B. E. VI – Semester (CBCS) (I.T.) (Backlog) Examination, October/November 2020

Subject: Data Base Systems (Elective-I)

Time: 2 hours   **Max. Marks: 70**

Note: Answer any five questions from Part-A, and four questions from Part-B.

PART – A (5X2=10 Marks)

1. What is meant by E-R modelling?
2. What is Data abstraction?
3. Differentiate between Union and Join operations.
4. What is Foreign key?
5. Explain 'Natural-Join' operation in relational algebra with an example.
6. Differentiate between 3NF and BCNF.
7. Explain about JDBC.
8. What is the significance of Concurrency control Schemes?
9. What is fragmentation? List out different types.
10. What is Query Optimisation.

PART – B (4X15=60 Marks)

11. (a) Explain Relational model with suitable examples.

    (b) What are different Database languages and explain.

12. (a) Explain the concept of recursion., aggregation with examples.

    (b) Discuss about Join, Union and intersection concepts with examples.

13. Explain in detail about database application paradigms in detail.

14. Discuss about the various database application interfaces.

15. Explain different types of distributed databases with suitable block diagrams.

16. (a) Explain propagation of Privileges using GRANT OPTION with an example.

    (b) What are various control measures used to provide security of data in databases.

17. Write short notes on

    (a) Graph Databases

    (b) NoSQL Databases.

* * *

FACULTY OF ENGINEERING

BE VI - Semester (CBCS)(ECE) (Backlog) Examination, October/November, 2020

Subject : Principles of Embedded Systems (Elective-I)

Time: 2 Hours   **Max. Marks :70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. Define Embedded system? Give examples

2. What is a decoupling capacitor? How is it useful in the design of a circuit?

3. Differentiate between microprocessor and microcontroller

4. Discuss the operation of the following registers of microprocessor:
   a) Program counter   b) Stack Pointer

5. List the characteristics of the round robin with interrupts architecture

6. What is a scheduler

7. Differentiate between cross compiler and cross assembler

8. Explain about ROM Emulator

9. Explain about assert macro

10. How is the host system a much friendlier environment for testing than the target

PART-B

Note : Answer any Four Questions   **(4x15= 60 Marks)**

11. a) With the help of neat sketches discuss about Open collector and tristating outputs

    b) Explain various types of memories in detail.

12. a) Explain the operation of UART and RS-232.
    b) What is a shared data problem? Explain with the help of example, how the shared data problem can be solved.

13. a) Distinguish the characteristics of various software architectures.

    b) Mention the advantages and disadvantages of round robin architecture.

14. Draw the block diagram of Native tool chain and explain the software development tools used in the embedded design.

15. a) What is an Instruction set simulator? Explain the features of Instruction set simulator.
    b) Explain about In circuit Emulator.

16. a) What is interrupt latency? Explain the method how the interrupt latency can be Reduced.
    b) Explain the challenges of embedded system design with the help of examples.

17. a) Explain the operation of Logic Analyser.

    b) Discuss about Host and Target systems.

******

FACULTY OF ENGINEERING

B.E. (EEE) VI-Semester (CBCS) (Main) (Backlog) Examination October/November 2020

Subject : Basics of Power Electronics (Elective-I)

Time: 2 Hours   **Max. Marks :70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. List the disadvantages of power electronic converters.
2. Represent the circuit symbol for SCR and IGBT.
3. List the applications of phase controlled rectifiers.
4. What is the effect of load inductance? Explain.
5. A step up chopper with a pulse width of $100\,\mu$ s is operating form 230 V dc supply. Compute the average value of load voltage for a chopping frequency of 2000Hz.
6. What is time ratio control in d.c choppers?
7. What is pulse width modulation? List the various PWM techniques.
8. Draw the voltage and current wave forms for a single phase bridge inverter when it is operated with RL load.
9. Enumerate merits and demerits of an ac voltage controller.
10. What is a cycloconverter? List the applications of cycloconvereter.

PART-B

Note : Answer any Four Questions   **(4x15= 60 Marks)**

11. a) Describe the switching characteristics of power MOSFET.
    b) Describe the different modes of operation of a thyristor with the help of its static V-I characteristics.

12. Discuss the effect of source inductance on the performance of a single phase fully controlled rectifier with neat waveforms and also derive the expression for output voltage.

13. Describe the working of buck converter with neat wave forms. Derive the expression for output voltage.

14. Describe the working principle of a three phase inverter with neat waveforms for a star connected resistive load, when each thyristor operates for 120^0 mode.

15. a) Describe the working principle of single phase step down cycloconverter with neat waveforms.
    b) Explain the operation of 1_ϕ AC voltage controller with R and RC cade

16. a) Draw a circuit diagram illustrating the protection of both anode and gate circuits of an SCR Describe briefly the function of various components used.
    b) A single phase full converter feeds power to RLE load with R = 6Ω , L = 6 mH and E=60V. the ac source voltage is 230 V, 50Hz. For continuous conduction find the average value of load current for a firing angle delay of 50^0.

17. Explain any two from the following
    a) Three phase dual converters
    b) Multiple pulse width modulation
    c) AC voltage regulator with RL load.

****

FACULTY OF ENGINEERING

B.E. VI semester (CBCS) (Backlog) Examination, October/November 2020

Subject: Industrial Robotics (Elective -I)

Time: 2 Hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Compare repeatedly and accuracy for a robot arm.
2. Which type of manipulator is suited for machine loading/unloading?
3. Explain the working of an LVDT as a sensor.
4. What is teach pendant programming?
5. What is template matching in computer vision?
6. What is redundancy with respect to degrees of freedom of a robot?
7. Sketch the workspace of a cylindrical (R-P-P) robot arm.
8. What is an interlock in a robot workcell?
9. What are the applications of 2-fingered and 3-fingered grippers?
10. In the figure shown, find the rotation matrix that relates frame B to Frame A.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. a) What are the features/requirements of a spray painting robot?
    b) Explain the working and application of a Vacuum gripper.
12. a) What are the major considerations in the selection of a sensors for industrial robots?
    b) Explain working of a range sensor.

13. a) Frame 1 is rotated by 45° about x-axis followed by rotation of 30° about current z-axis, to obtain frame 2. A point has coordinates (2,4,5) in Frame 2. What are its coordinates in Frame 1.
    b) How is an end point force/torque related to the static torques/forces at the joints?
    .
14. Explain the object descriptor or geometric features extracted from an image.

15. a) Explain equivalent Uniform Annual Cost method for introduction of robotic manufacturing.
    b) What are the typical characteristics of robot programming languages?

16. a) Write an algorithm for inverse kinematics solution of a typical 6-dof robot arm.
    b) State important factors that have led to use of robots in many industries.

17. a) What are the safety considerations to be attended to for the use of robots in Industry?
    b) Explain the operations of an RCC device used in assembly operations.

****

FACULTY OF ENGINEERING
B.E. 4/4 (Mechanical) VI-Semester (CBCS)(Backlog) Examination, October/November 2020

Subject : Material Handling (Elective – I)

Time : 2 Hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 Write short notes on Vibrating or Oscillating conveyors.
2 Give a brief on Bulk Material Handling Equipment and list at least four such equipment.
3 State the advantages of material handling system.
4 "Zero handling is the best handling" Criticize statement.
5 Enumerate the principle components of a Pneumatic Conveying System.
6 Explain the three types of AGVs, with one industrial application of each.
7 Define Bar Code System and state two important applications.
8 Differentiate the Two forms of Automated Data Collection – with reference to Bar Code and RFID.
9 Which are the two important sensors used in AGV – state its importance.
10 State the main costs involved in designing and operating a material handling system.

PART – B
Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 What are the principles of Material Handling to design an effective materials handling system? – Explain each one of these principles.

12 Explain pneumatic and hydraulic conveyors in detail with one example on each.

13 Explain gravity flow of bulk solids with neat sketch example.

14 What is AGV, how do AGVs know where to go? Explain with the various Navigation Systems used.

15 Explain the procedure of maintenance of material handling equipment.

16 Explain the basic hoisting systems and their application in a large maintenance Workshop and Automobile Manufacturing unit.

17 State the Unit Load concept and draw a neat sketch – Describe the advantages and disadvantages of Unit Load.

*****

FACULTY OF ENGINEERING

B.E. VI – Semester (CBCS) (Backlog) Examination, October/November 2020

Subject: Disaster Management (Elective – I)

Time: 2 Hours   Max.Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. What is the role of NIDM in disaster management?
2. Write short note on intensity of earthquakes.
3. What are the different types of chemical/industrial hazards explain the characteristics?
4. What are the components of GIS?
5. State the significance of cyclone shelters.
6. What is vulnerability?
7. Write disaster response after Droughts.
8. Explain about Heat waves as disaster.
9. Define Hazard?
10. Discusses urban economic imbalances?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 a) Explain link between drought and desertification use appropriate case studies?

   b) What is Disaster management cycle, explain each step?

12 a) How do you plan for evacuation when a disaster is a disaster is predicted?

   b) Explain link between drought and desertification use appropriate case studies?

13 a) Spational information technology is best tool how discusses with suitable example?

   b) What is Disaster management cycle, explain each step?

14 a) What is cyclone and disuses preventive measure for cyclone?

   b) Explain the role of mass communication during disaster?

15 a) Discusses responsibilities /duties of local, state and central government disaster risk reduction?

   b) What are the causes of floods and how do you mitigate floods?

16 a) Write causes of Road hazards in India and how to mitigate?

   b) Write about impacts of climate change as disaster?

17 a) What is risk mapping and vulnerability analysis explain the role of GIS in the above?

   b) Formulate and explain the types of warning systems that are available to alert the people in the case of predicted disaster such as floods, cyclones etc?

****