

FACULTY OF ENGINEERING
B.E. (Civil) V –Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Transportation Engineering

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. Draw line diagram showing different layers of flexible pavement and name each layer.
2. With a neat diagram explain different joint locations in cement concrete pavements.
3. Write the two standard ways for calculating modulus of subgrade reaction.
4. While aligning a hill road with a ruling gradient of 6 %, a horizontal curve of radius 80m is encountered. Find the compensated gradient of the curve?
5. What is negative super elevation? When negative super elevation is required in the geometric design of a railway track? Explain.
6. Define interlocking. Write its significance in brief.
7. What are the factors that affect the airport site selection?
8. Define creep in railways?
9. Write any three uses of transition curve?
10. What is meant by apron in airport planning?

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

11. Explain the various factors affecting highway alignment and explain the surveys that are to be performed to finalize the alignment.
12. The design speed on a highway is 100kmph. There is a horizontal curve of radius 250m on a certain locality. Calculate the super elevation needed to maintain this speed. If the maximum super elevation is exceeded, calculate the maximum allowable speed on this horizontal curve as it is not possible to increase the radius.
13. What are the functions of a sleeper? Explain the different types of sleepers.
14. Explain the necessity of gradients. Discuss the types of gradients giving their permissible values adopted in Indian railways.
15. (a) What are the objectives of signals in railways?
(b) Write a short note on Cant deficiency.
16. (a) Draw a neat sketch of a left hand and right hand turnout explaining its components.
(b) A curve of 6° is situated on a BG track. If the maximum permissible speed on curve is 65kmph, determine the equilibrium cant. What is the maximum speed that can be permitted allowing maximum cant deficiency?
17. (a) List the different components of an aircraft.
(b) The airport site has an elevation of 290m. Its reference temperature is 33.5° C. Determine the corrected runway length if the runway is to be constructed with an effective gradient of 0.2 percent. The length of a runway under standard ideal conditions is 1650m.

FACULTY OF ENGINEERING
B.E. (CME) V – Semester (AICTE) (Main& Backlog) Examination,
March / April 2022
Subject: Web Internet Technology
Professional 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 the term Web Servers.
2. Define Web Server List out various Web Server operations.
3. What is JavaScript? Are Java and JavaScript the Same?
4. Write about AJAX Server Script.
5. What is XML? What is the topmost element in a document called?
6. List four types of J2EE modules.
7. What is JDBC? What are the various types of JDBC Driver?
8. What are the JSP implicit Objects?
9. What is the difference between ServletConfig and ServletContext?
10. List the various Action Tags used in JSP?

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

11. (a) What is HTTP and Explain Http Request and Response Formats?
(b) Write short note on the following tags.
< img >, < table >, < frameset >, < pre >
12. How form handling is done in Java script? Explain. Also create and validate registration form using Java script.
13. (a) What is the use of XML namespaces? Explain in detail with an example?
(b) Why XSLT is important for XML?
14. Explain all 3 JDBC Statements (With Example)
(a) Statement (b) Prepared Statement (c) Callable Statement
15. What is session? Explain about session management.
16. (a) Explain JSP life cycle in detail.
(b) What are JSP basic tags?
17. Write short notes on any two of the following.
(a) AJAX
(b) Cascading Style Sheets
(c) JDBC

FACULTY OF ENGINEERING
B.E. (CME) (AICTE) V – Semester (Main & Backlog) Examination,
March / April 2022
Subject: Advanced Computer Architecture
Professional 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 the difference between Parallelism and Pipelining?
2. Define the terms throughput and bandwidth.
3. What is Amdahl's law?
4. What is the role of a memory manager in an OS kernel?
5. Differentiate pipelined and non-pipelined processors?
6. What is the difference between scalar processing and vector processing?
7. What is the motivation of an Array Processor?
8. What are the practical issues raised in interconnecting networks?
9. How performance of parallel processors is measured?
10. List the characteristics of multiprocessors.

PART – B

Note: Answer any five questions.

(5 x10 = 50 Marks)

11. Describe the architecture of the Uniprocessor Model.
12. Show that super scalar processors allow a faster CPU throughput with an example.
13. Describe about vector architecture in detail.
14. What is pipeline hazard? Discuss pipeline hazards in detail.
15. Explain synchronization mechanisms in detail.
16. (a) Describe the criteria for evaluation of computer systems.
(b) Discuss addressing modes in brief.
17. Write short notes on:
 - (a) Programming vector processors.
 - (b) Array processor environment.
 - (c) Cache coherence.

FACULTY OF ENGINEERING
B.E. (EEE) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Professional Elective – I
Electric Distribution Systems

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 are the factors affecting the primary voltage selection?
- 2 What is the effect of shunt capacitance on connection to a feeder in a distribution system?
- 3 Define the terms (i) Coincidence factor (ii) Load factor.
- 4 Draw the circuit diagram of double bus and single breaker bus scheme.
- 5 There are six residential customers connected to a distribution transformer (DT). The connected load is 9kw per house and that the demand factor and diversity factor for the group is 0.65 and 1.10. Determine the diversified demand of the group of 6 houses.
- 6 What is meant by tariff? Define time of day rate structure.
- 7 What is the function of line sectionalizes and isolators in a distribution system?
- 8 What is secondary banking? Draw the circuit diagram which has the highest reliability?
- 9 Mention various methods of improving power factor.
- 10 List all the components of a substation. Mention the rating of the power transformers generally used.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 (a) Explain about different types of load models with necessary equations.
(b) Draw the load characteristics of domestic, commercial and industrial load and explain the relationship between load and node voltage.
- 12 (a) Explain with neat diagrams the advantages and disadvantages of any three bus schemes which include the most efficient and economical bus scheme.
(b) Describe the basic design practice of the secondary distribution system.
- 13 (a) What are the advantages of using radial distribution system and its limitations.
(b) Explain AC three phase four wire system with neat diagram.
- 14 (a) Explain the method of improving power factor by method of using synchronous Condenser.
(b) Enumerate the benefits with application of capacitors in distribution systems.
- 15 What are the benefits of distribution automation? Explain the terms transformer load management, load shedding and peak load pricing with respect to DAC.
- 16 Derive the equation for KVA rating of a substation having n feeders.
- 17 Discuss the application of shunt capacitors in distribution system. Draw the phasor diagram. Justify how it is economical.

FACULTY OF ENGINEERING
B.E. (EEE) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Professional Elective – I
Renewable Energy Sources

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 are the limitations of renewable energy sources?
- 2 Define the following: Surface Azimuth angle, Zenith angle.
- 3 Classify wind energy conversion systems.
- 4 List out the applications of geothermal energy at different temperature levels.
- 5 Explain the process of photosynthesis.
- 6 What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere?
- 7 What are the limitations of tidal power generation?
- 8 What is meant by wet fermentation and dry fermentation?
- 9 Draw the neat diagram of China type digesters.
- 10 Brief about the different solar collector – plate configurations.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 Classify wind energy conversion systems. Discuss in detail about polarization in fuel cells.
- 12 Explain in detail about any two Point focusing type solar collectors.
- 13 Classify the different wind schemes for electrical generation and explain them in detail.
- 14 With neat schematic diagrams and T-S diagrams explain the following:
 - (a) Claude cycle OTEC power generation
 - (b) Liquid dominated double flash steam system.
- 15 Explain in detail about dry conversion processes of biomass conversion technologies
- 16 Discuss the following:
 - (a) Solar pond electric power plant with cooling towers
 - (b) Liquid dominated total flow concept.
- 17 (a) With neat diagram explain in detail about cross-draught gasifier.
(b) With neat diagram explain in detail about wave energy conversion by floats.

FACULTY OF ENGINEERING
B.E. (EEE) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Professional Elective – I
Hybrid Electric Vehicles

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 rolling resistance in vehicle.
- 2 Advantages of HEV over ICE vehicle.
- 3 What is electric propulsion system?
- 4 Explain parallel power flow control of HEV.
- 5 Which machine is highly suitable 4-wheeler application of EV?
- 6 What are advantages of BLDC motor EV applications?
- 7 What are the requirements of energy suppliers of HEV?
- 8 Compare lithium ion battery with ultra capacitors.
- 9 What are the factors to be considered for selection EV charging station?
- 10 Draw the single diagram of EV charging station.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 (a) Explain the EV drive train alternatives based on power source configuration.
(b) Compare the performance of ICE based conventional vehicle and electric vehicles.
- 12 Illustrate the power flow control in hybrid electric drive train.
- 13 Draw and explain the block diagram of switched reluctance motor drive system.
- 14 (a) Compare different batteries based on their specific energy, specific power and suitability HEV applications.
(b) Explain the super capacitor based energy storage and also state its limitations.
- 15 (a) What are factors to be considered for the selection and sizing of charging stations?
(b) Explain in detail about stationary inductive charging.
- 16 Describe briefly about the vehicle power source characteristics.
- 17 Explain in detail the configuration and control of permanent magnet motor drive.

FACULTY OF ENGINEERING
B.E. (EIE) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Professional Elective – I
Advanced Sensors

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 sensor electronics is needed in sensor system?
- 2 What are the limitations of sensor measurements in capacitance?
- 3 What is immobility of bio receptor?
- 4 What is micromachining?
- 5 What is smart sensor?
- 6 State the working principle of field sensor.
- 7 What is the working principle of fiber optic sensor?
- 8 What is biochemical sensor?
- 9 Write the characteristics of robotics sensors.
- 10 State the working principle of proximity sensor.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 Explain some of the performance characteristics of sensor system with respect to a typical sensor system (example: accelerometer).
- 12 (a) What are the consideration in biosensor? Also write short notes on mechanism in bio receptor molecules.
(b) Write short notes on NANO tubes.
- 13 (a) Explain the principle of inductive sensor with suitable diagrams.
(b) Write short notes on application of smart sensors in wireless networks.
- 14 (a) Explain the operating principle and working of any one smart sensor.
(b) Which law governs the magnetic sensor? Explain the construction and working of Hall Effect sensor?
- 15 (a) Write short notes on measurement of temperature on fiber optics with suitable diagram.
(b) Write short notes on fictile sensor.
- 16 (a) Mention the classification of sensors in detail.
(b) What are future prospects of biosensors?
- 17 Write short notes on:
 - (a) Fiberoptics temperature sensors
 - (b) BioMEMS.

FACULTY OF ENGINEERING
B.E. (CME) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Computer Graphics
Professional 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 are the applications of Computer Graphics?
- 2 Differentiate physical and synthetic imaging system.
- 3 List the different types of logical devices.
- 4 Write about different frames in OpenGL.
- 5 Give OpenGL transformation matrices to perform translation, rotation and scaling.
- 6 Define parallel projection and give matrices for parallel projection.
- 7 Enumerate illumination models. Which one is the better model?
- 8 Give binary region codes for line clipping.
- 9 What is stack based traversal?
- 10 What is scene graph?

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

- 11 (a) Explain about synthetic camera model with neat diagram.
 (b) What is API? Explain OpenGL viewing and control functions.
- 12 (a) What are display lists? Explain the steps to develop interactive models and animate interactive programs.
 (b) Explain about modeling colored cube.
- 13 (a) Find the matrix transformation for rotating the polygon with vertices (2,6), (4,8), (10,90), (3,8) and (5,7) with 60° in counter clockwise direction.
 (b) Explain the perspective projections with reference point and vanishing point with a neat diagram.
- 14 Describe Cohen Sutherland line clipping algorithm. Using this algorithm clip the following line segments against a window $w_{x1} = 50$, $w_{y1} = 50$, $w_{x2} = 100$, $w_{y2} = 100$

(i)	line P_1P_2	$P_1(80,30)$	$P_2(90,60)$
(ii)	line P_3P_4	$P_3(60,60)$	$P_4(70,70)$
(ii)	line P_5P_6	$P_5(30,70)$	$P_6(70,120)$
(iii)	line P_7P_8	$P_7(120,60)$	$P_8(125,80)$.
- 15 (a) Explain about hierarchical modelling with structure.
 (b) Explain the use of tree data structures.
- 16 (a) Explain the constructive solid geometry method Octree.
 (b) Explain about clipping in three dimensions with a neat diagram.

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17 Write short notes on the following:

- (a) Programmable pipelines
- (b) Antialiasing
- (c) Different types of light sources supported by OpenGL.

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FACULTY OF ENGINEERING

B.E. (CSE) V - Semester (AICTE) (Main & Backlog) Examination, March / April 2022

**Subject: Professional Elective – III
Block Chain Technology**

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 Distinguish between Ethereum and Bitcoin Block chain.
- 2 What is Public Block chain and describe its advantages and disadvantages?
- 3 What is Federated Blockchain and describe advantages and disadvantages?
- 4 How useful is Blockchain To Digital Protection and Cybersecurity.
- 5 What are the types of Consensus Algorithms in Blockchain?
- 6 How are Blocks Chained Together?
- 7 What is the difference between public and private key?
- 8 What is a 51% attack in Blockchain?
- 9 What is ASIC resistance and how its related to Blockchain?
- 10 Explain following:
 - (a) Sidechain
 - (b) Namecoin

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 What are the components of Blockchain Ecosystem? Explain.
- 12 (a) What is Proof-Of-Work (POW) and Proof-Of-Stake?
(b) How Does Proof-Of-Work (POW) and Proof-Of-Stake Consensus Algorithms Work?
- 13 What are the Key features / Properties of Blockchain?
- 14 (a) How Is Block chain Distributed Database different from Traditional Databases?
(b) What is the difference between a centralized network, decentralized network, and distributed ledger?
- 15 (a) What are the Benefits and Drawbacks of Block Chain?
(b) What is Double Spending? Is it possible to spend in a Blockchain system?
- 16 Briefly describe following and explain the applications in Blockchain.
 - (a) Digital Signature - ECDSA
 - (b) Memory Hard Algorithm
 - (c) Zero Knowledge Proof
- 17 Brief about:
 - (a) Roots of Bitcoin
 - (b) Legal Aspects-Crypto currency Exchange

FACULTY OF ENGINEERING

B.E. (CSE) V - Semester (AICTE) (Main & Backlog) Examination, March / April 2022

**Subject: Information Retrieval Systems
Professional Elective – III**

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 are Boolean Queries? Give an example.
- 2 What is selective dissemination of information?
- 3 Define pattern matching.
- 4 What is metadata?
- 5 What is concept of indexing?
- 6 Differentiate between term clustering and item clustering.
- 7 What is latent semantic indexing?
- 8 Define a Bayesian Network.
- 9 List some Hardware text search systems.
- 10 What is TREC?

PART – B

Note: Answer any five questions

(5 x 10 = 50 Marks)

11. Draw and explain the architecture of IR system.
- 12(a) Discuss various search capabilities of an information retrieval system.
(b) Compare and contrast digital libraries and information retrieval system.
13. What is stemming? Discuss Porter's stemming algorithm.
- 14(a) Compare text compression techniques.
(b) Explain the Indexing of Text Searching.
15. Explain query expansion through local clustering and through global analysis.
16. Explain various text searching algorithms.
17. Write notes on:
 - (a) Markup languages
 - (b) Hierarchical agglomerative clustering

FACULTY OF ENGINEERING

B.E. (CSE) V – Semester (AICTE) (Main & Backlog) Examination, March / April 2022

**Subject: Soft Computing
Professional Elective - III**

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 are the applications of Soft Computing?
- 2 List rules of fuzzy logic.
- 3 Define classical Relation.
- 4 Compare supervised and unsupervised learning.
- 5 List the fuzzy propositions in fuzzy arithmetic.
- 6 What is function mapping?
- 7 Show the structure of McCulloch-Pitts Neuron model.
- 8 What is Learning Vector Quantization?
- 9 Define Generation Cycle.
- 10 What is Multilevel optimization?

PART – B

Note: Answer any five questions

(5 x 10 = 50 Marks)

- 11 (a) Distinguish between Hard Computing and Soft Computing.
(b) Discuss about counter propagation networks.
- 12 (a) Describe about Defuzzification for fuzz sets in detail.
(b) Explain Crisp relations with an example.
- 13 (a) Write about fuzzy reasoning.
(b) Explain fuzzy logic control system with an example.
- 14 Explain Radial basis function network with neat sketch.
- 15 (a) Distinguish between Traditional Algorithms and Genetic Algorithms.
(b) What are constraints in Genetic Algorithms?
- 16 Write notes on:
(a) Classification of Genetic Algorithms
(b) Multiple linear neuron.
- 17 (a) Explain Tolerance and equivalence relations.
(b) What is the role of fuzzy decision making in fuzzy system?

FACULTY OF ENGINEERING

B.E. (CSE) V - Semester (AICTE) (Main & Backlog Examination, March / April 2022

**Subject: Computer Graphics
Professional Elective – III**

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 triangulation?
- 2 What is rasterization in the context of the OpenGL pipeline architecture, and what are the inputs and outputs to the rasterization step?
- 3 What is picking?
- 4 What is difference between window coordinates and screen coordinates?
- 5 Give OpenGL transformation matrices to perform translation, rotation and scaling.
- 6 Why to remove the hidden surfaces?
- 7 Enumerate illumination models. Which one is the better model?
- 8 How do you clip a concave polygon?
- 9 What is Imperative programming paradigm?
- 10 Give tree structure for an automobile.

PART – B

Note: Answer any five questions

(5 x 10 = 50 Marks)

- 11 (a) Explain the OpenGL synthetic camera model, including how it relates to a pin hole camera and how it relates 3D space to 2D images.
(b) What is API? Explain OpenGL viewing and control functions.
- 12 (a) What are display lists? Explain how an event driven input can be programmed for a keyboard device.
(b) Explain about three dimensional primitives.
- 13 (a) Prove that rotation and scaling matrices do not commute.
(b) Derive parallel-projection transformation matrices.
- 14 (a) Explain Gourand and Phong Shading with neat diagram.
(b) Explain Cohen Sutherland Line clipping algorithm with an example.
- 15 (a) Explain about hierarchical modelling with structure.
(b) Explain about Scene Graphs with example.
- 16 (a) Write a program for torus.
(b) Demonstration transformation from world coordinates to viewing coordinates with matrix representation.
- 17 Write short notes on the following:
 - (a) Light sources in OpenGL
 - (b) Interactive input devices
 - (c) Programmable pipelines

FACULTY OF ENGINEERING

B.E. (I.T.) V - Semester (AICTE) (Main & Backlog) Examination, March / April 2022

**Subject: Computer Networks
Professional 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 How is a computer network different from other types of networks?
- 2 Compare Link state routing and distance vector routing.
- 3 A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?
- 4 List the elements of Transport Protocols.
- 5 What is the function of Internet super server?
- 6 List the transparency issues with reference to RPC.
- 7 What is the relationship between domain name and an IP subnet number?
- 8 Write any two differences between static and dynamic web documents.
- 9 Why is EDE (Encrypt Decrypt encrypt) used in 3DES instead of EEE (Encrypt Encrypt Encrypt)?
- 10 What is the function of SSL?

PART – B

Note: Answer any five questions

(5 x 10 = 50 Marks)

- 11 (a) How do the layers of TCP/IP correlate to the layers of the OSI model?
(b) Discuss Congestion Control in Datagram Subnets using choke packets.
- 12 (a) Classify IP addresses and explain them.
(b) List the fields in the TCP header that are missing from UDP header. Give the reason for their absence.
- 13 (a) Explain connection-oriented and connectionless scenario using socket system calls.
(b) Discuss the steps involved in RPC.
- 14 (a) Describe the architecture of World Wide Web.
(b) Define Domain Name Service (DNS) and explain in detail about the domain hierarchy and name servers.
- 15 (a) Draw and explain the encryption model for a symmetric-key cipher.
(b) Explain Pretty Good Privacy with the help of neat sketch.
- 16 (a) Compare and contrast LAN, MAN and WAN.
(b) Explain the concept of tunneling with neat sketch.
- 17 Write short notes on the following:
 - (a) Sun RPC
 - (b) Wireless web
 - (c) IPSec

FACULTY OF ENGINEERING
B.E. (CME) V - Semester (AICTE) (Main & Backlog) Examination,
March / April 2022
Subject: Information Retrieval Systems
Professional 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 case folding? Give an example.
- 2 Define a stop word. How do they effect the number of postings?
- 3 What is the parametric index?
- 4 Define Bag of Words model.
- 5 What is relevance feedback? Which search method is a good example of relevance feedback?
- 6 Illustrate the vector space model using two categories of documents.
- 7 Define Precision and Recall.
- 8 Define accuracy of a text classifier.
- 9 Illustrate the bow tie structure of the web.
- 10 Differentiate a hub and authority.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 Explain in detail with a clear example about INTESECTWITHSKIPS or skip pointer algorithm.
- 12 What is Single-pass-in-memory-indexing?
- 13 Give Roccio Algorithm of relevance feedback. When does relevance feedback work?
- 14 Explain about feature selection in IR.
- 15 What is the Page Rank algorithm? How is page rank value computed for a network? Explain with an example.
- 16 Compare the advertising model of Yahoo GoTo and Google search engines.
- 17 Write short notes on
 - (a) Distributed Indexes
 - (b) Connectivity Servers
 - (c) Bernoulli distribution.

FACULTY OF ENGINEERING**BE (Civil) V - Semester (CBCS) (Backlog) Examination, March / April 2022****Subject: Environmental Engineering****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 any four water quality parameters and its standards for potable water.
2. Define per capita demand of water and various factors on which it depends.
3. Distinguish between detention period and overflow rate
4. List out different types of coagulants used in water treatment plant and discuss the role of polyelectrolyte in coagulation process.
5. Distinguish between conservancy system and water carriage system in sewage collection.
6. The 5 days BOD of waste is 200 mg/l and reaction rate constant is 0.17 per day. Find ultimate BOD of waste
7. Discuss various method used for aeration in activated sludge process.
8. List out various unit operation involved in preliminary treatment of sewage
9. What is sludge digestion process?
10. What are different types and sources of solid waste?

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

11. a) The population of four decades i.e. 1960, 1970, 1980 and 1990 is 8000, 12000, 17000 and 22,500 respectively. Estimate the population after 1, 2 and 3 decades by Geometrical increase method.
b) Explain briefly about Hardy-Cross method in finding out distribution of flow in pipe network.
12. a) Design set of three rapid sand filter for treating water at water works, which has to supply the water to a town of population 1,00,000. Per capita of the town is 270 liter per day. The rate of filtration of rapid gravity filter may be taken as 45000 liters/hour/m².
b) Explain different methods of application of chlorine at different stages in water treatment.
13. a) Explain various sewer appurtenances.
b) Estimate the velocity of flow and discharge through the sewer when running one-half full. A sewer having diameter 1.2m is laid at gradient of 1 in 400. Assume $N=0.012$ in Mannings formula.
14. Discuss in detail tickling filter and activated sludge process used as secondary treatment unit in sewage treatment plant.

15. Design the dimension of septic tank for small colony of 150 persons provided with an assured water supply from municipal head works at a rate of 129 lpcd. Assume if any data required.
16. a) Compare slow sand filter and rapid sand filter.
b) Explain the process of sedimentation in treatment of water. Discuss different between plain sedimentation and coagulation.
17. Explain the following
a) Solid waste disposal method
b) Rotating biological contractor
c) Intake structure

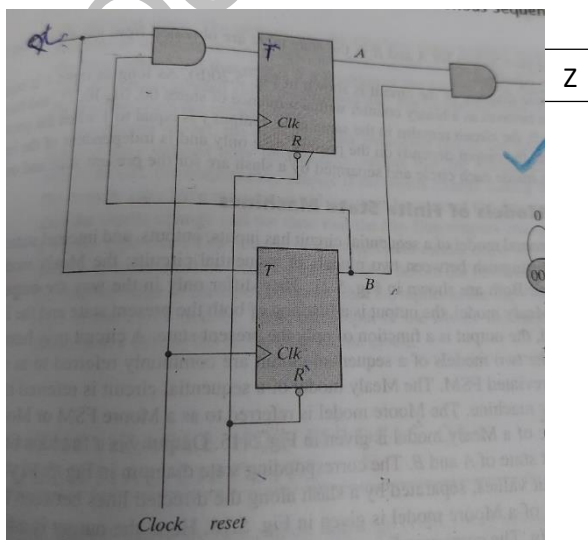
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FACULTY OF ENGINEERING**B.E. (ECE) V - Semester (CBCS) (Backlog) Examination, March / April 2022****Subject: Digital System Design with Verilog HDL****Time: 3 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer all questions.****(10 x 2 = 20 Marks)**

1. Explain compiler directives used in Verilog.
2. Explain representation of numbers in Verilog.
3. Differentiate between initial and always statement in Verilog.
4. What is RTL code with example?
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. Compare hardware descriptive language with C-language.
9. Define Melay and Moore machine.
10. Differentiate between PLA and PAL.

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

- 11 (a) What are system task and compiler directives supported in Verilog HDL?
(b) Write Verilog code for Half Adder in data flow model.
- 12 (a) Write Verilog code for CMOS NAND gate in switch level modeling.
(b) Explain multi-way branching statement used in Verilog HDL.
- 13 (a) Write the steps for partitioning method.
(b) Explain one hot encoding with example.
- 14) Analyze the given synchronous sequential circuit.



..2..

- 15 (a) Design vending machine controller and implement Verilog code.
(b) Differentiate between ASM and ASMD chart.

- 16 (a) Implement following Boolean function using PROM.

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

- (b) Draw the FPGA and CPLD simplified architecture.

- 17 Write a short notes on:

- (a) Hazards with design examples.
(b) Memory devices.

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FACULTY OF ENGINEERING
B.E. (MECH/PROD) V - Semester (CBCS) (Backlog) Examination,
March / April 2022
Subject: CAD/CAM

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 CAD, CAM and CIM.
- 2 What are the basic drawing commands used in drafting techniques?
- 3 mention the different solid modeling entities used in 3D modeling.
- 4 What are Bezier curves? Give the equation for its representation.
- 5 What are the four types of modeling data used in data exchange?
- 6 What is process planning?
- 7 What do you understand by .stl format?
- 8 Define CNC and DNC type of machines.
- 9 What is the advantage of using Group Technology?
- 10 Define RPT.

PART – B

Note: Answer any five questions

(5 x 10 = 50 Marks)

- 11 Explain the drafting techniques briefly explaining each entity used in it.
- 12 Write in detail about Surface Modeling.
- 13 Explain the different types of joints used in robot configurations.
- 14 What are the advantages of data exchange? Mention and explain any two types of exchange specifications.
- 15 A triangle having vertices (1, 10), (5, 2) and (8, 4) is translated by 3 units in y-direction. It is then rotated by 45° in C.C.W. direction. Then it is scaled by 3 units in the x-direction. Find the final position of the triangle.
- 16 What is coding and classification in Group Technology? Mention their uses.
- 17a) What are the characteristics of an FMS system?
b) Define the terms limits and fits in detail.

FACULTY OF ENGINEERING**B.E. (CSE) V Semester (CBCS) (Backlog) Examination, March / April 2022****Subject: Managerial Economics and Accountancy****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 demand function?
- 2 Define Monopoly.
- 3 What are the types of demand.
- 4 Define subsidiary books?
- 5 Explain about price demand.
- 6 Define ISO-Cost production function.
- 7 Write Journal Entries for the following.
 - a) Purchased goods for cash Rs.10,000/-
 - b) Paid Rent to land lord Rs.7,000/-
- 8 What is BRS?
- 9 What is payback period?
- 10 How prepaid expenses given in adjustments are dealt in final accounts?

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

- 11 Define Managerial Economics its usefulness to Engineers.
- 12 a) Explain the scope of managerial economics
 - b) What are factors influencing demand
- 13 Define Market and differentiate between perfect and imperfect market.
- 14 From the following data calculate:
 - a) Break-even point in units
 - b) Break-even point Rs.
 - c) P/v ratio

Selling price per unit Rs.100 variable cost per unit Rs.60 fixed cost Rs.1,00,000
- 15 A project require an investment of Rs. 50,000 and are expected to generate Net cash flows are under:

YEAR	1	2	3	4	5
Rs.	50,000	75,000	1,25,000	1,30,000	80,000

Calculate Net present value.

- 16 Prepare a Bank Reconciliation Statement as on 31-12-2016
- Cash book balance as on 31-12-2016 Rs.1,75,000
 - Cheques amounting to Rs.80,000 issued on 28-12-2016 not presented for payment
 - Cheque deposited Rs.60,000 on 25-12-2016 were not credited before losing date.
 - Interest on investment Rs.4,000/- was collected and credited by bank.
 - Bank charges debited in pass book Rs.60/-

- 17 From the following particulars prepare Trial Balance as on 31-12-2010.

Particulars	Rs.
Capital	25,000
Opening Stock	6,200
Cash	1,700
Sundry debtors	9,100
Purchases	61,300
Sales	93,600
Return Outwards	1,000
Return inwards	500
Frieght inwards	3,700
Frieght outwards	7,200
Salaries	10,500
Rent	6,000
Sundry creditors	4,000
Commission received	100
Drawing	6,300
Furniture and fittings	10,800
Printing and stationery	1,200
Closing stock	12,000

Allow interest on Capital at 5%

FACULTY OF ENGINEERING

**BE III / IV (Civil/CSE/IT) I - Semester (NON-CBCS) (Backlog) Examination,
March / April 2022**

Subject: Managerial Economics and Accountancy

Time: 3 Hours

Max. Marks: 75

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

PART – A

Note: Answer all questions.

(25 Marks)

1. What is Firm?
2. Relate with Micro economics Vs Macro economics
3. State Demand function
4. What is Law of Supply?
5. Define isoquant?
6. Tell about Cobb-doughlas production function.
7. Infer the Pay – back method?
8. What is Profitability index?
9. Define financial statement?
10. What is meant by Trial balance error?

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

11. a) What is Managerial Economics? How does it differ from economics?
b) Write a note on Opportunity cost
12. Define demand and describe its determinants with suitable examples.
13. a) Analyse different cost concepts
b) Explain different types of ratios.
14. A firm has declared the following details about its
Sales :
Year 1 Year 2
Sales (Rs.) 1,50,000 1,50,000
Profit (Rs.) 15,000 25,000
i) Calculate PV Ratio
ii) Find out the firm's BEP
iii) How much should the company produce and sell to earn profit of Rs. 50,000?

-2-

15. A project involves initial outlay of Rs. 1,29,000. Its working life is expected to be 3 years. The cash inflows are likely to be as follows:

Year	Inflows
1	64,000
2	56,000
3	24,000

Compute the IRR

16. Journalise the following transactions of Mr. Ravi and post them in the ledger and balance the same.

2010, June 1 Ravi invested Rs. 5,00,000 cash in the business

3 Paid into bank Rs. 80,000

5 Purchased building for Rs. 3,00,000

7 Purchase goods for Rs. 70,000

10 Sold goods for Rs. 80,000

15 Withdrew cash from bank Rs. 10,000

25 Paid electric charges Rs. 3,000

30 Paid salary Rs. 15,000

17. From the following trial balance of Sharan, prepare trading and profit and loss account for the year ending 31st December, 2017 and balance sheet as on the date. The closing stock on 31st December, 2017 was valued at Rs. 2,50,000.

Debit Balances	Rs	Credit Balances	Rs.
Stock (1-1-2017)	2,00,000	Sundry creditors	12,000
Purchases	7,50,000	Purchases returns	30,000
Carriage inwards	75,000	Sales	10,20,000
Wages	3,65,000	Commission received	53,000
Salaries	1,20,000	Capital	33,00,000
Repairs	12,000		
Rent and taxes	2,80,000		
Cash in hand	97,000		
Land	21,50,000		
Drawings	1,66,000		
Bank deposits	2,00,000		
	44,15,000		44,15,000

FACULTY OF ENGINEERING
B.E. III / IV (EEE/EIE) I - Semester (NON-CBCS) (Backlog) Examination,
March / April 2022

Subject: Linear Control Systems

Time: 3 Hours

Max. Marks: 75

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

PART – A

Note: Answer all questions.

(25 Marks)

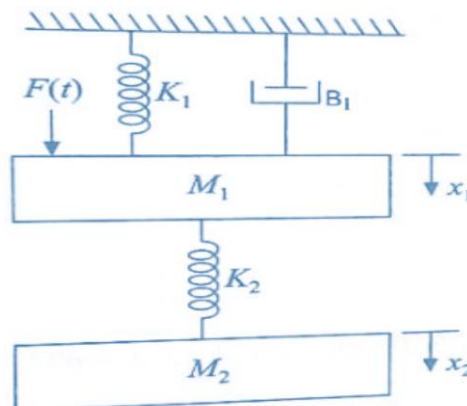
1. What are the different components of Control system?
2. Define F-V analogy and write down the F-V electrical analogue of mechanical System
3. Explain the PID Controller.
4. Determine the stability of the characteristic equation $S^4 + 8S^3 + 18S^2 + 16S + 5$.
5. What is Phase Margin?
6. What are the advantages of frequency response analysis?
7. Define controllability and observability.
8. How to choose state variables in a system?
9. Draw the architecture of digital control system?
- 10 . Compute e^{At} , $A = \begin{bmatrix} 0 & 1 \\ 1 & 2 \end{bmatrix}$

PART – B

Note: Answer any five questions.

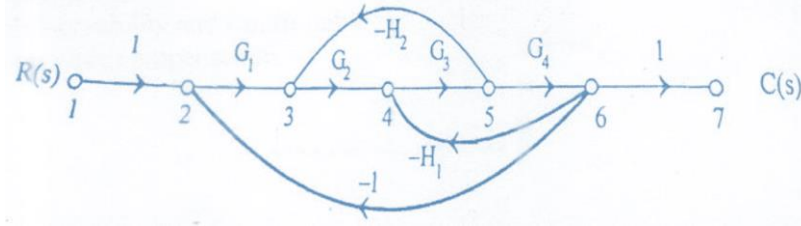
(5 x 10 = 50 Marks)

11. a) Write the differential equations governing the behavior of the mechanical system shown in fig below. Also obtain the analogous electrical circuit based on Force – Voltage analogy.



- b) Transfer function of Armature controlled D.C. servomotor.

12. a) Find the overall transfer function for the single flow graph shown in figure.



b) What are different types of controller. Explain

13. Draw the root locus of the system having open loop transfer function.

$$G(s) = \frac{k}{s(s+2)(s+4)}$$

Find 'K' when damping ratio E is 0.5 from the plot?

14. Draw the Bode plot and determine the Gain margin and phase margin of a Unity Feedback System with the following Open Loop Transfer function

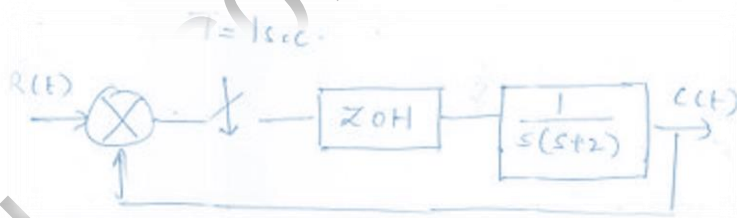
$$G(s)H(s) = \frac{5}{s(s+1)(s+4)}$$

15. Find the time response of the System described by state model for unit step input

$$\dot{x}(t) = \begin{bmatrix} -1 & 1 \\ 0 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$x(0) = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$$

16. Find $\frac{C(Z)}{R(Z)}$, and find stability



17. a) What are different Rules of Block diagram reductions.

b) What is compensation, different types of compensation techniques.

FACULTY OF ENGINEERING
B.E. III / IV (ECE) I - Semester (NON-CBCS) (Backlog) Examination,
March / April 2022
Subject: Pulse and Digital Circuits

Time: 3 Hours

Max. Marks: 75

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

PART – A

Note: Answer all questions.

(25 Marks)

- 1 Explain the fractional list of a high pass RC Circuit. Write its expressions.
- 2 Draw CMOS inverter.
- 3 What are the methods of generating a time base waveform?
- 4 Draw the transfer characteristics of clamper.
- 5 Compare the different logic families.
- 6 Define the terms slope error, displacement error.
- 7 What are the merits and demerits of TTL logic?
- 8 Define multivibrator and their types.
- 9 Calculate the gate width of a Monostable multivibrator $R=10K$ and $C=10 \mu f$.
- 10 Define SCR and its characteristics.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 (a) Explain about RLC circuit.
(b) Describe the relationship between rise time and RC time constant of a low pass circuit.
- 12 (a) With the help of neat circuit diagram, explain the working of a two level Clipper.
(b) Give the circuit if different types of shunt clipper and explain their operation with the help of their transfer characteristics.
- 13 (a) What are general features of time base signal? Explain.
(b) Explain the operation of emitter coupled Bistable multivibrator.
- 14 (a) What is significance of Totem pole output in TTL logic family.
(b) Compare CMOS and TTL.
- 15 (a) Draw a TTL NAND gate and explain its operation.
(b) Describe ECL logic. With the help of a neat diagram, explain the waveform of a two input ECL OR/NOR gate.
- 16 (a) State and prove clamping circuit theorem and explain the transfer characteristics of clamper.
(b) Explain the need of the attenuator.
- 17 Write short notes on:
 - (a) ECL
 - (b) Compare UJT and SCR.

FACULTY OF ENGINEERING

**B.E. III / IV (ECE) I - Semester (NON-CBCS) (Backlog) (Old) Examination,
March / April 2022**

Subject: Microprocessors and Microcontrollers

Time: 3 Hours

Max. Marks: 75

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

PART – A

Note: Answer all questions.

(25 Marks)

- 1 What is the need for addressing mode? Explain advantages of indirect addressing mode.
- 2 Explain the different interrupt structure.
- 3 Differentiate between Macros and procedures.
- 4 Define the following Assembler directive in 8086 (i) EQU (ii) OFFSET.
- 5 Explain the BSR control word format of 8255.
- 6 Compare microprocessor and microcontroller.
- 7 Explain RESET interrupt of 8051.
- 8 What is external memory interfacing of 8051?
- 9 Describe the function of the following pin of 8051 (i) RST (ii) XTALI (iii) \overline{PSEN} .
- 10 Write a ALP for 8051 to compliment the upper nibble of the given byte 57H.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

- 11 Explain in detail the architecture of 8086.
- 12 (a) What is assembly language program? Discuss about Debugging tools.
(b) What is stack? Discuss its role in call subroutine with example.
- 13 (a) Explain the operational modes of 8257 DMA controller.
(b) Explain the operational modes of 8254 programmable timer.
- 14 What is the difference between serial and parallel data transmission? Explain 8251 communication interface.
- 15 (a) How do you program 8051 timer in mode 1 to generate a delay of 5ms?
(b) Describe memory organization of 8051.
- 16 (a) Draw and explain internal architecture of 8251 USART.
(b) What are different addressing mode in 8051?
- 17 Write a short note on any two of the following:
 - (a) LCD interfacing
 - (b) Analog and digital converter
 - (c) Bit addressable feature of 8051.