

FACULTY OF ENGINEERING

B.E. (Civil) V-Semester (CBCS) (Backlog) Examination, November 2020

Subject : Infrastructure Engineering (Elective-I)

Time : 2 hours

Max. Marks : 70

Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.

PART – A (5x2=10 Marks)

- 1 What is the concept of life Cycle?
- 2 Mention the legal issues for infrastructure development.
- 3 Discuss the planning phase of infrastructure projects.
- 4 State the significance of infrastructure.
- 5 State some prestigious road transportation Infrastructure projects in India.
- 6 Mention the strategies for successful implementation of infrastructure projects.
- 7 What are special economic zones?
- 8 Write some problems of infrastructure privatization.
- 9 Write classification of infrastructure projects based on urban transportation system?
- 10 Discuss about the role of water supply in infrastructure?

PART – B (4x15=60 Marks)

- 11 a) Describe the significance of “Special Economic Zones” (SEZs).
b) Present an overview of infrastructure projects in power sector.
- 12 a) Write a brief historical overview of infrastructure privatization.
b) Mention the benefits of infrastructure privatization.
- 13 a) State the legal issues in infrastructure projects.
b) Write about core economic & Demand risks.
- 14 a) List the challenges in construction and maintenance of infrastructure.
b) Discuss the different stages in infrastructures projects.
- 15 a) Mention the attributes and parameters for Environmental Impact Assessment of infrastructure projects.
b) Describe the considerations involved in land and water inter-relationships.
- 16 a) Write about shaping and planning phase of infrastructure engineering.
b) Write about mapping and facing the landscape of risks in infrastructure projects.
- 17 Write short notes on any three of the following:
 - a) Issues in Telecom Sector
 - b) Feasibility Report
 - c) Contractual issues in infrastructure
 - d) Socio-Environmental Risks

FACULTY OF ENGINEERING**B. E. (Civil) (CBCS) V – Semester (Backlog) Examination, November 2020****Subject: Soft Computing Skills in CE (Elective – I)****Time: 2 hours****Max. Marks: 70****Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.****PART – A (5x2=10 Marks)**

- List out two major limitations of L.P.Model.
- Distinguish between Slack, Surplus and Artificial variables.
- State your understanding on curse of dimensionality.
- Compare Biological Neuron and Artificial Neuron.
- Two fuzzy sets are given below, Compute Union, Intersection and Complement.

$$\tilde{A} = \left\{ \frac{0.1}{2}, \frac{0.3}{4}, \frac{0.5}{6}, \frac{1.0}{8} \right\}$$

$$\tilde{B} = \left\{ \frac{0.2}{2}, \frac{0.4}{4}, \frac{0.7}{6}, \frac{1.2}{8} \right\}$$

- Write binary coding for 7 and 5.
- What is cross over in Genetic Algorithm?

PART – B (4x15=60 Marks)

- (a) Explain simplex Algorithm and various steps involved using the same to solve L.P. Problem.
(b) Explain the steps involved to solve L.P. problems with degeneracy.
- (a) Solve the following L.P. Problem

$$\text{Max } Z = 2X_1 + 5X_2 + 7X_3$$

Subjected to

$$3X_1 + 2X_2 + 4X_3 \leq 100$$

$$X_1 + 4X_2 + 2X_3 \leq 100$$

$$X_1 + X_2 + 3X_3 \leq 100$$

$$X_1, X_2, X_3 \geq 0$$

- (b) Write the general standard form of L.P. Model and explain various variables.
- Allocation of water has to be done to two different irrigated regions and also for industrial water supply from a canal system. Formulate a Dynamic Programming Model for the problem. Also solve the problem using the benefits of these allocations to users given below. Make allocation of the available resources of 100 units in steps of 25 units.

Quantity units	Irrigated Region 1	Irrigated Region 2	Industrial Supply
25	04	03	05
50	06	05	07
75	09	09	09
100	12	13	11

11. (a) Explain briefly various Architectures for Neural Network model.
(b) Distinguish between Supervised and Unsupervised Learning in Nerural Nets.
12. (a) Consider two fuzzy sets given below. Compute Algebraic Sum, Algebraic Product, Bounded Sum and Bounded Difference.

$$\tilde{A} = \left\{ \frac{0.2}{1}, \frac{0.4}{3}, \frac{0.6}{5}, \frac{1.0}{7} \right\} \quad \tilde{B} = \left\{ \frac{0.4}{1}, \frac{0.5}{3}, \frac{0.6}{5}, \frac{1.1}{7} \right\}$$

- (b) Explain with the aid of example how you adopt a Fuzzy Based Model in Water Resources briefly.
13. (a) With the help of flow chart explain various steps of Genetic Algorithm.
(b) Explain how Genetic Algorithm can be adopted to Water resource problem briefly.
14. Write short note on the following:
- (a) Rule based Fuzzy model.
(b) Sigmoidal Function in Neural Networks.
(c) Comparison of Big M method and two phase methods.

FACULTY OF ENGINEERING**B.E. (EEE) V – Semester (CBCS) (Backlog) Examination, November 2020****Subject: Programmable Logic Controllers (Elective – I)****Time: 2 hours****Max. Marks: 70****Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.****PART – A (5x2=10 Marks)**

- 1 List five micro processors used in PLC CPUs, which is least powerful. Which is most powerful? Why?
- 2 What is the function of input and output modules of a PLC?
- 3 How does PLC input instruction latch / unlatch work?
- 4 Give format of module addressing.
- 5 Draw ladder program for simple counter application.
- 6 List 4 trigonometric / log functions.
- 7 Convert the hexa number ABC to octal.
- 8 Give one application for PLC SKIP function.
- 9 What is REGISTER to TABLE PLC function?
- 10 Differentiate between normally open contact and normally closed contact.

PART – B (4x15=60 Marks)

- 11 a) Discuss the input and output devices which are connected to PLC.
b) What are the different kinds of programmer monitors used in PLC?
- 12 a) Construct a ladder diagram for starting an induction motor in forward-reverse with mutual interlocks.
b) Construct gate symbols and PLC ladder diagrams for the following word description. For output 7 to be on, Input 6 must be off and either input 8 or 9 must be on in addition one of the input 1, 2, or 3 must be as.
- 13 List the five major types of registers. Use a block diagram to show where each type fits into the PLC scheme of operation.
- 14 a) Discuss the PLC multiplication function with a process control application.
b) What are the basic comparison functions which are available in all PLCs? Give an example of a derived function from the basic functions.
- 15 a) Differentiate between jump with return and jump with non return.
b) Discuss the need of PLC matrix function.
- 16 a) In a certain process, after a count of 15 from a sensor, a paint spray is to run for 25 seconds. Develop a ladder program for this timer counter problem.
b) Discuss PLC sequence function.
- 17 Write short notes on the following:
 - a) PLC functions working with bits.
 - b) History of PLC.

FACULTY OF ENGINEERING**B.E. (EEE) V – Semester (CBCS) (Backlog) Examination, November 2020****Subject: Electronic Instrumentation (Elective – I)****Time: 2 Hours****Max. Marks: 70****Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.****PART – A (5x2=10 Marks)**

- 1 What are the advantages and disadvantages of optical encoders?
- 2 A piezo electric crystal having dimensions of 5 mm X 5 mm X 1.5 MM and a voltage sensitivity of 0.055 V- m/N is used for force measurement. Calculate the force if the voltage developed is 100 V.
- 3 Draw the characteristics of AC and DC amplifiers.
- 4 A differential amplifier has two inputs of 5 mV and 3 mV. The output is 300 mV. What is the amplifier gain?
- 5 Draw different types of demodulated waveforms.
- 6 Brief the characteristics of a quantizer.
- 7 List out the basic characteristics of digital meters.
- 8 Explain the working principle of graphic recorders.
- 9 What are the advantages of magnetic tape recorders?
- 10 Explain the principle of sampling oscilloscope.

PART – B (4x15=60 Marks)

- 11 With necessary diagrams explain in detail about piezo electric transducers for measurement of force.
- 12 a) Explain the following operational amplifier circuits:
 - i) Operational amplifier as inverter
 - ii) Operational amplifier as an adderb) A balanced output source provides a signal of 30mV from each terminal to ground. This provides a difference signal of 60 mV for a difference amplifier. The noise signal common to both terminals is 600 mV. The differential gain of the amplifier is 150, while the common mode gain is 0.04. What is the ratio of signal to noise at the output?
- 13 a) Explain the operation of input modulator.
 - b) With neat diagram explain the working principle of self(automatic) balancing wheatstone bridge.

- 14 a) Explain its principle of operation, construction and working of digital frequency meter.
- b) With neat block diagram explain about single and multiple period(average) measurement system.
- 15 a) Draw the sketch of a CRT and explain its operation in detail.
- b) Determine detection sensitivity of a CRO, given that with usual notation,
 $l = 2.5\text{cm}$, $L = 20\text{ cm}$, $d = 2.5\text{ mm}$, $V_d = 5\text{V}$ & $V_a = 2000\text{V}$.
- 16 a) Describe in detail about the successive approximation method of analog to digital conversion.
- b) Explain the principle and working of a storage oscilloscope.
- 17 a) Discuss in detail about potentiometric type digital voltmeter.
- b) Draw IEEE-488 instrumentation Bus Structure and explain various interfaces of it.

FACULTY OF ENGINEERING
BE V Semester. (CBCS) (EEE) (Main & Backlog) Examination, November 2020

Subject: Facts Devices (ELECTIVE-I)

Time: 2Hours

Max Marks: 70

Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.

PART – A (5x2=10 Marks)

- 1) List out different FACTS controllers.
- 2) What are different control parameters in AC System?
- 3) Discuss SVC.
- 4) How to improve transient stability in FACTS?
- 5) List the models of TCSC.
- 6) Give applications of saturated reactor.
- 7) List the advantages of STATCOM.
- 8) Give the frequency range of different control parameters.
- 9) What is the necessity of compensation?
- 10) How can you prevent voltage instability in power system?

PART – B (4x15=60 Marks)

11. a) Discuss power flow in MESHED AC power systems.
b) Discuss series- series controller and series -shunt controller.
12. Describe In detail about SVC and STATCOM.
- 13 Name the different variable type series compensator and explain operating principle and characteristics of TSSC.
14. What is external control for series reactive compensation? Explain
15. Discuss independent real and reactive power control with proper derivations and figures
16. a) How to improve system stability of transmission lines in FACTS?
b) Explain in detail about UPQC.
17. Discuss a) Power oscillation damping
b) Characteristics of STATCOM.

FACULTY OF ENGINEERING

B. E. V – Semester (CBCS) (Backlog) Examination, November 2020

Subject: Advanced Sensors

Time: 2 hours

Max. Marks: 70

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

PART – A (5X2 = 10 Marks)

1. Why sensor electronics is needed in sensor system?
2. Discuss at least one mean which convert passive device information into voltage information.
3. What is immobility of bio receptor?
4. Write the salient features of Nano sensors.
5. What is smart sensor?
6. Justify that the electromagnetism can be used in sensing.
7. All biological odor detection is done by ___ part of human body acting as chemical sensor. Justify your answer.
8. How intrinsic and extrinsic fiber optics sensors differ?
9. Write the characteristics of robotics sensors.
10. Give an example of binary and analog robotics sensors.

PART – B (4X15 = 60 Marks)

11. Explain some of the performance characteristics of sensor system with respect to a typical sensor system (example and accelerometer).
12. Explain a few guidelines for selecting and installing measurement system.
13. (a) What is micro machining? Explain the various stages micromachining needed for fabrication of MEMS sensor.
(b) What is CNT (Carbon Nano Tubes)? Explain how it works.
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) Discuss a few conductometric sensors.
(b) Explain the working and construction of fiberoptics displacement sensor.
16. Explain the different types of proximity sensor used to measure distance of object for robotics applications.
17. Write short notes on:
(a) Fiberoptics temperature sensors
(b) BioMEMS

FACULTY OF ENGINEERING**BE V- Semester (CBCS) (CSE) (Backlog) Examination, November 2020****Subject : Artificial Intelligence (Elective – I)****Time: 2 Hours****Max. Marks: 70****PART - A****Note: answer any five question****(5 x 2 = 10 Marks)**

1. Define production rule?
2. Differentiate depth first iterative deepening and depth first search
3. Differentiate propositional calculus and predicate calculus
4. Prove that the following theorem in natural deduction system

$$[(A \rightarrow B) \wedge (B \rightarrow C)] \rightarrow (A \rightarrow C)$$
5. Write the characteristics of expert system?
6. State Bayes Theorem?
7. Is logical XOR function is linearly seperable
8. What is perceptron? What are its limitations?
9. Write the six cases in case grammar theory?
10. List the different types of parsers and explain any one of them?

PART - B**Note: answer any four question****(4 x 15 = 60 Marks)**

11. a) Solve the following crypt arithmetic problem with the help of constraint satisfaction. Two + Two = four
 b) Explain alpha-beta pruning with example
- 12 Explain about the knowledge representation using semantic net with an example
- 13 a) Explain about the truth maintenance system
 b) Explain Bayesian belief network
- 14 a) Explain single layer feed forward network with an example of OR function.
 b) What are the design issues of artificial neural network
- 15 What is semantic web? Explain how resource description framework is used to build semantic web?
- 16 What are the different phases in natural language processing. Explain?
17. Explain the construction of Decision tree with an example.

FACULTY OF INFORMATICS

B.E. (IT) V-Semester (CBCS) (Backlog) Examination, November 2020

Subject : Artificial Intelligence (Elective-I)

Time : 2 hours

Max. Marks : 70

Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.

PART – A (5x2=10 Marks)

- 1 State Turing test.
- 2 List the different exhaustive searches.
- 3 List the main components of an expert system. Define mass function.
- 4 Define ANN.
- 5 Explain the different types of layers in artificial neural networks.
- 6 Explain the significance of Frames in knowledge representation.
- 7 Define skolemization.
- 8 Explain logical entailment in predicate calculus.
- 9 Write the expression for sigmoid function.

PART – B (4x15=60 Marks)

- 10 a) Show that the statement “If it is humid then it will rain and since it is humid today it will rain” is a valid argument.
b) Write and explain best first strategy and explain how it combines DFS and BFS approaches.
- 11 There are two jugs, a 5-gallon (5-g) and other 3-gallon (3-g) with no measuring marker on them. There is endless supply of water through tap. The task is to get 4-gallon of water in the 5-g jug. Describe the state space and production rules and find the solution path.
- 12 a) Differentiate between expert systems and traditional systems.
b) Describe Bayesian Network. Sketch a Bayesian Network to illustrate its construction for an example problem.
- 13 a) Define perception and design a perceptron for the Boolean function OR.
b) Explain Backpropagation Algorithm.
- 14 Explain A* Algorithm with an example and describe admissibility in A*.
- 15 Draw a semantic network representing the following knowledge using prop links and answer the query “**Does a parrot breathe?**”
Every human, animal and birds are living things who can breathe and eat. All birds can fly. Every man and woman are humans who have two legs. A cat has fur and is an animal. All animals have skin and can move. A giraffe is an animal and has long legs and is tall. A parrot is a bird and is green in color. John is a man.
- 16 Write short notes on :
 - a) Hill climbing
 - b) Dempster – Shafer theory

FACULTY OF ENGINEERING

B. E. (IT) (CBCS) V– Semester (Main & Backlog) Examination, November 2020

Subject: Multimedia Technologies (Elective – I)

Time: 2 hours

Max. Marks: 70

Note: Answer any five questions from Part-A. Answer any Four questions from Part-B.

PART – A (5x2=10 Marks)

1. Define Multimedia. List any three novel applications of multimedia.
2. Name multimedia software tools for Graphics and Image Editing.
3. List out the different types of file formats.
4. Suppose we decide to quantize an 8-bit grayscale image down to just 2 bits of accuracy. What is the simplest way to do so?
5. What is sound? What is the sampling rate to digitize audio data?
6. What does S-video stand for? How many and what signals are used in S-video?
7. Distinguish between lossy compression and lossless compression.
8. What are the advantages of Arithmetic Coding as compared to Huffman Coding?
9. List the 4-tuple that is used by TCP for demultiplexing.
10. What is the main difference between a static image and video?

PART – B (4x15=60 Marks)

11. (a) Write short notes on Hypermedia.
(b) How does VRML differ from HTML? What are the advantages of VRML?
12. Discuss about color models in video.
13. (a) Which do you think has less detectable flicker, PAL in Europe or NTSC in North America? Justify your conclusion.
(b) Describe the structure of MIDI messages.
14. Briefly discuss about Video compression techniques.
15. (a) What is the relation between delay and jitter? Describe a mechanism to mitigate the impact of jitter.
(b) Suggest at least three ways in which audio analysis can assist in video retrieval system-related tasks.
16. (a) Explain how HTML can be used for developing multimedia for web.
(b) Explain about CIE chromaticity diagram.
17. Write short notes on the following:
 - (a) Digital video recording formats.
 - (b) H.261 encoder.
 - (c) Real Time streaming protocol.