

ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 701 ANALYTICAL INSTRUMENTATION
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Draw and explain the conductivity measuring circuit (8M)
b) Explain the construction of conductivity cell (7M)
- Or**
- c) What is a spectrophotometer? Explain a typical UV/ visible spectrometer using double beam (15M)
2. a) Give in detail the classifications of Chromatography. Briefly explain Liquid Chromatography (15M)
- Or**
- b) Write short notes on:
(i) Resonance conditions in NMR.
(ii) NMR absorption spectra.
(iii) Radio- frequency transmitter and receiver. (15M)
3. a) Explain the Beckman Paramagnetic Oxygen analyser with neat diagram (15M)
- Or**
- b) Explain the principle and working of a carbon monoxide monitor (8M)
c) Explain briefly about NOX analysis. (7M)
4. a) Explain basic principles of nuclear radiation detection. What are the various types of nuclear radiation detectors and explain in detail of any one of them. (15M)
- Or**
- b) What are the thermal Analyzers. Explain types of thermal analysers (15M)

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
- a) State and explain the Beer-Lambert's law
b) With schematic diagram describe Calomel Electrode
c) Sketch the components of a Gas Chromatography.
d) Explain the importance of gas analysis in industry.
e) Explain about the Working Principle of Electron Spin Resonance (ESR).
f) What are Absorption and Emission Spectrophotometers?
g) Write about Pollution Monitoring systems.
h) What is a GM counter and explain its various designs.

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ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 702 DIGITAL IMAGE PROCESSING
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1.
 - a) Explain the basic concepts of sampling and quantization in the generation of digital image (8M)
 - b) Explain about the basic steps of Image Processing System (7M)

Or

 - a) State and prove the translation and rotation properties of 2D-DFT (8M)
 - b) What is the need of image transform? List out various transform used in image Processing (7M)
2.
 - a) Differentiate between Spatial domain and Frequency domain methods in image Processing (15M)

Or

 - b) Explain about image sharpening filters and image smoothening filters (15M)
3.
 - a) Explain about Huffman coding by taking an example (8M)
 - b) What is an Image pyramid? Explain Gaussian and Laplace pyramids (7M)

Or

 - c) Define image segmentation. Give classification. Explain region based segmentation (8M)
 - d) Differentiate between Lossy and Lossless Compression models (7M)
4.
 - a) Define an image restoration. Explain the image restoration model (8M)
 - b) Explain opening and closing operations. (7M)

Or

 - c) Explain about Hough Transform (8M)
 - d) Explain about watermarking in image processing (7M)

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
 - a. List out different noises in images
 - b. Write the applications of KL Transform.
 - c. Compare different image formats with reference to number of bits and compression.
 - d. Explain about Spatial and Temporal redundancy.
 - e. Explain about Dilation and Erosion.
 - f. Write short notes on Max and Min filters.
 - g. Write the difference between Fourier transform and wavelet transform.
 - h. Write short notes on morphological gradient

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ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 703 VIRTUAL INSTRUMENTATION
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Draw and explain the basic difference between traditional Instruments and software based Virtual Instruments (15M)
Or
b) Explain the layers of Virtual Instrumentation Software and the software and Hardware role (15M)
2. a) How the DAQ hardware is configured in real time (15M)
Or
b) Explain the Architecture of PX1 with neat diagram (15M)
3. a) Explain the concept of Instrument control using RS 232C (15M)
Or
b) Explain about Active X Programming (15M)
4. a) Explain about Image Acquisition and Processing (15M)
Or
b) Explain the VI Tool set (15M)

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
 - a. What are advantages of virtual Instrumentation?
 - b. How does While loop vary from for loop
 - c. Define Auto Indexing
 - d. What is bus Interface? Explain briefly
 - e. What is meant by Embedded Controller
 - f. Explain about IEEE 488
 - g. What are distributed I/O Modules
 - h. Explain about Motion Control

ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 704(a) FIBER OPTIC AND LASER INSTRUMENTATION
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) What are different types of Optical Fibers. Explain In detail (15M)
Or
b) Explain about the Principle of Light Propagation through a Optical Fiber (15M)
2. a) Explain about the operation of LED and PIN (15M)
Or
b) Explain the Measurement of Pressure and level using Optical Fibers (15M)
3. a) What is LASER ? Explain the LASER Configuration (15M)
Or
b) Explain different types of LASERS (15M)
4. a) Explain about Fiber Optic Measurement of Velocity and Acceleration (15M)
Or
b) What is Holography? Explain its Principle and Method (15M)

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
 - i. What are losses in Fiber optical cable?
 - j. Write are advantages of Fiber Optical Cable.
 - k. Explain about LED and LASER
 - l. What is the role of Optical Fiber in Biomedical Applications.
 - m. What is Mode Locking
 - n. Discuss about Semiconductor LASER
 - o. What are Industrial Applications of LASER
 - p. What are Acoustic – Optic Modulators

ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 704(b)ARTIFICIAL NEURAL NETWORKS AND FUZZY LOGIC
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Explain the biological prototype of neuron. Also explain the characteristics of neuron **(15M)**
Or
b) Explain with neat sketch the McCulloch-Pitts model of artificial neural network? **(15M)**
2. a) What are the learning strategies? Explain any two? **(15M)**
Or
b) Describe the activation dynamic models? **(15M)**
3. a) Discuss the working of single layer perceptron and multilayer perceptron with relevant algorithm and compare them **(15M)**
Or
b) Write about the applications of perceptron model? **(15M)**
4. a) Define membership? What are different types of membership functions with neat schematic? **(8M)**
b) Discuss any two membership value assignment? **(7M)**
Or
c) How do you convert a fuzzy set to single crisp value and discuss the methods to be used? **(15M)**

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
 - q. List out the Potential Applications of ANN.
 - r. Write about Neuron Activation Function.
 - s. What is Single Layer Feed Forward Neural Networks?
 - t. Explain about Kolmogorov Theorem.
 - u. Write about Reinforcement learning.
 - v. Differentiate fuzzy set from classical set and name the properties of classical (crisp) sets
 - w. Write the Applications of Fuzzy Logic
 - x. What is classical set?

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ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 704(c) RELIABILITY ENGINEERING
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Explain the importance of the terms 'reliability' and 'quality' (15M)
Or
b) Define Reliability and discuss about the discrete random variables and continuous random variables (15M)
2. a) Explain with examples random variables (8M)
b) Derive expression for mean and standard deviation of exponential distribution. (7M)
Or
c) What are different Component Reliability? Explain hazard rate (15M)
3. a) Explain about the Maintainability function and Availability function (15M)
Or
b) discuss about the need for Reliability Improvement. (15M)
4. a) Discuss about Economics of Reliability Engineering (15M)
Or
b) Explain about Reliability management by objectives (15M)

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
- a) Explain Exponential distribution with graphs
b) Discuss about the history of reliability.
c) Explain about MTTF and MTTR
d) Explain about Depreciation cost models
e) Define Reliability, Availability and Maintainability.
f) How many components having reliability of 0.9 are required to have overall reliability of system of 0.99?
g) Write short notes on Reliability Management.
h) Three components having reliabilities 0.8, 0.85 and 0.9 are connected in parallel
(i) What is the overall reliability of the system?
(ii) If another component of reliability 0.7 is connected in series to this system, What is the reliability of the resultant system?

ADIKAVI NANNAYA UNIVERSITY
IV B.TECH – I SEMESTER
ELECTRONICS AND INSTRUMENTATION ENGINEERING
BTEIE 704(d) ROBOTICS AND AUTOMATION
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Define Robot and what are its types? With the help of Sketch describe Pitch, Yaw and Roll Motion of Robot wrist **(15M)**

Or

b) What are the types of Range sensors? Compare Hydraulic, Pneumatic and Electrical Drive Systems **(15M)**
2. a) Explain about Electronic and Pneumatic Manipulators **(15M)**

Or

b) Explain about Hydraulic and Pneumatic Actuators **(15M)**
3. a) Derive Inverse Kinematic Algorithm of LL robot and RR Robot **(15M)**

Or

b) Derive the general Jacobian Matrix **(15M)**
4. a) Explain Different ways of Accomplishing Lead through Method of robot Programming **(15M)**

Or

b) Discuss about applications of Robot in Manufacturing and Non Manufacturing Process **(15M)**

Section-B (5 X 3 =15 Marks)

5. **Write a Short Note on any FIVE of the following**
 - a. Define the term Automation
 - b. What is Dynamic Stabilization of Robotics
 - c. Define Manipulators
 - d. What is a gripper
 - e. What is meant by Hill Climbing Technique
 - f. What is Euler Formations
 - g. Define a Robot Programming
 - h. List out the Industrial Robot Applications