

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
IV B.TECH – I SEMESTER
ELECTRONICS AND COMMUNICATION ENGINEERING
BTECE701: RADAR SYSTEMS

MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) Draw and explain simple radar block diagram. [8M]
b) Explain how radar cross section controls the radar performance. [7M]
(OR)
c) Derive modified radar range equation. [8M]
b) Explain the effect of Signal to Noise ratio in radar with suitable expressions. [7M]
2. a) Describe the operation of CW Radar with neat diagram. [8M]
b) Explain the range and Doppler measurement of FM-CW radar. [7M]
(OR)
c) Discuss, what are the limits effects the MTI performance. [8M]
d) Discuss how error signal is generated from sequential lobing [7M]
3. a) Describe the operation of amplitude comparison mono pulse radar for single angular coordinate. [8M]
b) Explain radar antenna parameters. [7M]
(OR)
c) Draw and explain the block diagram of two-coordinate amplitude-comparison mono pulse tracking radar. [8M]
d) Design and explain cosecant-squared antenna pattern. [7M]
4. a) Write a short note on architecture for phased arrays. [8M]
b) Discuss the relationship between matched filter characteristics and correlation function. [7M]
(OR)
c) Write a short note on (a) Circulator as Duplexers
(b) Beam steering and Beam width changes [8M]
d) Describe the operation of digitally phase shifters. [7M]

Section-B (5 X 3 =15 Marks)

5. Answer any FIVE of the following:

- a) List the applications of radar.
- b) Mention salient features of FMCW radar.
- c) What is blind speed? How it can be avoided
- d) Distinguish amplitude and phase comparison mono-pulse radar.
- e) Mention the types of tracking.
- f) What is need of delay line canceller?
- g) Define noise figure.

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
IV B.TECH – I SEMESTER
ELECTRONICS AND COMMUNICATION ENGINEERING
BTECE702: DIGITAL IMAGE PROCESSING
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) What are the components of Image processing system. Explain briefly. (7M)
b) What are the fundamental steps in DIP. (8M)
- OR**
- c) Derive SVD and KL Transform. (8M)
d) Explain Hadamard transform and Haar transform. (7M)
2. a) Explain the fundamentals of spatial filtering. (8M)
b) What are the combining spatial enhancement methods (7M)
- OR**
- c) What are the sampling and the Fourier transform of sample functions. (7M)
d) Explain image smoothing using frequency domain filters. (8M)
3. a) Explain periodic noise reduction by frequency domain filtering. (15M)
- OR**
- b) Explain LZW coding. (15M)
4. a) What are some basic morphological algorithms. (15M)
- OR**
- b) What are the colour fundamentals colour models pseudo colour image processing. (15M)

Section-B (5 X 3 =15 Marks)

5. Answer any FIVE of the following:
- a) Explain discrete cosine transform.
- b) What are some basic relationships between pixels.
- c) What are sharpening spatial filters
- d) What are histogram processing.
- e) Explain block transform coding.
- f) Explain geometric mean filter.
- g) Explain colour image compression.
- h) What is smoothing and sharpening.

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
IV B.TECH – I SEMESTER
ELECTRONICS AND COMMUNICATION ENGINEERING
BTECE703: OPTICAL COMMUNICATIONS
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

1. a) Explain the basic principal of Optical Fiber. Compare Optical Fiber with Coaxial cable as a communication channel. [7M]
b) For a multimode step index optical fiber of glass core of refractive index 1.5 and quartz cladding of refractive index 1.46 , determine:
(i) critical angle (ii) Acceptance angle (iii) Numerical aperture [8M]
(OR)
c) Explain electromagnetic mode theory in optical fiber in detail. [8M]
d) Explain the importance of cladding in optical fiber communication. Justify the statement: “Light travels faster in cladding than core”. [7M]
2. a) Explain core and cladding losses. Explain losses due to bending [7M]
b) Derive the equation for intermodal dispersion [8M]
(OR)
c) Differentiate between graded index and step index also define birefringence and V number [8M]
d) Explain the different types of methods to minimize signal distortion in optical fibers [7M]
3. a) Write a short note on different types of fiber connectors [8M]
b) What are the different types of alignments in optical fibers [7M]
(OR)
c) Explain Butt joint connectors with neat circuit diagrams. [8M]
d) Explain the connector return losses in optical fibers. [7M]
4. a) Draw the light output versus current curve and explain the operation of LASER. [8M]
b) Explain the semiconductor injection laser diode resonating mode. [7M]
(OR)
c) Differentiate between power coupled to step index fiber and graded index fiber [8M]
d) Explain the fundamental receiver operation in optical fiber communication [7M]

Section-B (5 X 3 =15 Marks)

5. Answer any FIVE of the following:

- a) Explain the terms : (i) Cut off wave length (ii) Mode field diameter
- b) What are the requirements of optical fiber? Explain glass and plastic materials in detail.
- c) What are the mechanical properties of optical fibers? Explain
- d) Explain the following terms : (i) Meridional rays (ii) Skew rays
- e) Explain scattering losses in optical fibers
- f) Write short notes on multiplexing in fiber optic receivers
- g) What are the different types of light source materials

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
III B.TECH – II SEMESTER
BTEIE704A: INFORMATION THEORY AND CODING
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. A) Explain Concept Of Amount Of Information And Its Properties. (15M)
OR
B) Explain About Entropy And Properties. (15M)
2. A) Explain About Shanon Fano Coding With Examples. (15M)
OR
B) Capacity Calculation For Band Limited Gaussian Channels. (15M)
3. A) Explain About Error Detection And Error Correction Capabilities Of Linear Block Codes. (15M)
OR
B) Matrix Description Of Linear Block Codes. (15M)
4. A) Explain Encoding Of Convolution Codes With Suitable Derivations. (15M)
OR
B) Explain The Concept Of Viterbi Algorithm. (15M)

Section-B (5 X 3 =15 Marks)

Answer any FIVE of the following:

5. Give Short Notes On

- a) Discrete Messages.
- b) Mutual Information.
- c) Shannon Theorem.
- d) Channel Capacity.
- e) Hamming Codes.
- f) Binary Cyclic Codes.
- g) Trees.
- h) Trellis.

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
III B.TECH – II SEMESTER
BTECE704B: ARTIFICIAL NEURAL NETWORK 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

a) List out the Potential Applications of ANN.

b). Write about Neuron Activation Function.

c). What is Single Layer Feed Forward Neural Networks?

d). Explain about Kolmogorov Theorem.

e). Write about Reinforcement learning.

f). Differentiate fuzzy set from classical set and name the properties of classical (crisp) sets

g). Write the Applications of Fuzzy Logic

h). What is classical set?

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) With the help of a practical software radio model, explain the characteristics and benefits of a software radio. [8M]
b) Outline the modules of SCA software framework. [7M]
(OR)
c) How would you explain the purpose of RF-Front end in the design of a software radio system? [7M]
d) Explain the following (i) The Heterodyne receiver
(ii) Dual conversion super Heterodyne receiver (6). [8M]
2. a) Create a Software Radio spectrum Analyser using GNU radio. [8M]
b) Describe the software that can be used in implementing the Software radio environment. [7M]
(OR)
c) Perform a case study on TMS320C54x series DSPs. [15M]
3. a) Elaborate on the Common Object Request Broker Architecture (CORBA) [15M]
(OR)
b) Considering Transfer characteristics of ADC/ DAC. What approach would you use in order to avoid the interference of other signals that impinge upon a radio's antenna . [15M]
4. a) Discuss the impacts of the Dynamic range and its limitation in the design of software radios. Present diagrams if required. [15M]
(OR)
b) Summarize the noise and distortion that act as limiting factors in the RF circuit performance. [8M]
c) Considering Transfer characteristics of ADC/ DAC. What approach would you use in order to avoid the interference of other signals that impinge upon a radio's antenna? [7M]

Section-B (5 X 3 =15 Marks)

5. Answer any FIVE of the following:

- a) List down the four Software Radio Acquisition Parameters
- b) Outline the characteristics and benefits of SDR
- c) Interpret the necessity of the phases in SPEAK Easy program
- d) What is the purpose of transmitter RF section?
- e) Draw the block diagram of a digital AGC system
- f) Draw the block diagram of a simple base station receiver
- g) State sampling rate conversion.
- h) Sketch the Interpolated Nyquist Pulse.

ADIKAVI NANNAYA UNIVERSITY::RAJAMAHENDRAVARAM
IV B.TECH – I SEMESTER
ELECTRONICS AND COMMUNICATION ENGINEERING
BTECE704D: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
MODEL QUESTION PAPER

Time: 3hrs.

Max. Marks: 75

SECTION-A (4 X 15 = 60 M)

Answer ALL Questions

1. a) What is the significance of the number of significant figures in a stated quantity?
Give some Examples (7M)
b) How the working of a potentiometer type digital voltmeter be explained (8M)
OR
c) Define the sensitivity of a multimeter. Explain the operation of a multimeter using a simple block (8M)
d) What is the principle and operation of Thermocouple RF type Ammeter. (7M)

2. a) Discuss the Square wave and Pulse generator with neat block Diagrams. (8M)
b) Explain the significance and working of frequency selective wave analyzer (7M)
OR
c) Draw the circuit diagram and explain the operation of Digital spectrum analyzer (7M)
d) Explain the dynamic response of a second order instrument . (8M)
3. a) Write short notes on portable oscilloscopes . (8M)
b) With a neat diagram, describe the working of a triggered sweep CRO (7M)
OR
c) Explain the operation of vertical amplifier used in a CRO (8M)
d) Explain the operation of trigger pulse circuit. (7M)

4. a) Describe the method of measuring high impedance using Q-meter (8M)
b) Explain the working of capacitive transducers (7M)
OR
c) Explain the working of capacitive transducers. (8M)
d) Describe the construction and working of LVDT. (7M)

Section-B (5 X 3 =15 Marks)

- 5. Answer any FIVE of the following:**
- a) Define the terms Accuracy and resolution
 - b) Define sensitivity and precision of an instrument
 - c) Explain how the range of DC voltmeter is extended
 - d) Describe the standard specifications of a CRO
 - e) What are the applications of spectrum analyzer
 - f) What are the main elements of velocity transducer
 - g) Define Gauge factor for transducer and explain its significance.
 - h) Principle of LVDT.

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