Hall Ticket No: **Question Paper Code:**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
III/IV B. Tech II- Semester Regular Examinations April - 2018
Digital Communication
(ECE)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1	a	With a neat block diagram, explain briefly about the elements of digital communication system.	(**6M**)
	b	What are the advantages of MSK over QPSK? Draw spectrum to verify your answer.	(**6M**)

(OR)

2	a	Explain the generation and detection of a coherent binary PSK signal and derive its power spectral density and plot it	(**7M**)
	b	What are the drawbacks of DM? Explain in detail How can you overcome by usingADM.	(**5M**)

UNIT-II

3	a	What are the characteristics of optimum filter? Explain in detail.	(**6M**)
	b	Find the probability of error for coherent FSK modulation system?	(**6M**)

(OR)

4	a	Explain correlation receiver with block diagram. Also explain why the correlation receiver is also called an integrated and dump filter.	(**7M**)
	b	Compare between BPSK, QPSK and BFSK modulation schemes	(**5M**)

UNIT-III

5	a	With a neat block diagram, explain the Frequency hopped spread spectrum transmitter and receiver	(**8M**)
	b	Define the terms, processing gain & Jamming Margin	(**4M**)

(OR)

6	a	What is PN sequence? List out its properties.	(**6M**)
	b	Describe the concept of Ranging using DSSpread Spectrum method.	(**6M**)

UNIT-IV

7	a	Consider five symbols given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16. (i) Calculate Entropy (ii) Use Huffman algorithm to develop an efficient code and calculate the average number of bits/symbol. Compare with Entropy.	(**6M**)
	b	State and prove the properties of entropy	(**6M**)

(OR)

8	a	What is Shannon theorem? Obtain the channel capacity for Gaussian channel.	(**7M**)
	b	An analog signal band limited to 10HKz is quantizedwith 8-levels of PCM System with probability of 1/4,1/5,1/4,1/10,1/20,1/10,1/20 and 1/10 respectively. Find the entropy and rate of information.	(**5M**)

UNIT-V

9	a	Explain the generation of convolution code with an example	(**6M**)
	b	Give the comparison of error rates in coded and uncoded transmission	(**6M**)
10	a	Explain about linear block coder. What is the matrix description of linear block code?	(**6M**)
	b	Explain about cyclic code vector for (7,4) cyclic code with a generator polynomial $G(p) = p^3 + p + 1$ in systematic form	(**6M**)

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ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

III/IV B. Tech II- Semester Regular Examinations April - 2018

Digital Signal Processing

(ECE)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

1. **a.** Determine the impulse response h(n) for the system described by the second order difference equation

$y(n) - 4y(n-1) + 4y(n-2) = x(n-1)$ **(6M)**

b. Find the magnitude and phase response for the system characterized by the difference equation $y(n) = \frac{1}{2}x(n) + x(n-1) + \frac{1}{2}x(n-2)$ **(6M)**

(OR)

2. **a**. Check the following filter for time invariant, causal and linear **(6M)**

(i) $y(n) = (n-1)(n+1)$

(ii) $y(n) = x(n-2)$

b. Draw the structures of cascade and parallel realizations of **(6M)**

$$H(z) = \frac{(1-z^{-1})^3}{\left(1-\frac{1}{2}z^{-1}\right)\left(1-\frac{1}{8}z^{-1}\right)}$$

UNIT-II

3. **a**. Determine the 8 point DFT of the sequence **(8M)**

$$X(n) = \begin{cases} 1; & -4 \le n \le 4 \\ 0; & \text{otherwise} \end{cases}$$

b. Compare overlap-save method and overlap-add method. **(4M)**

(OR)

4. **a.** Compute 4-point DFT of a sequence x (n) = { 0,1,2,3} using DIT algorithm **(6M)**

b. Find the IDFT of the sequence using DIF algorithm X (k) = {10, -2-j2, -2, -2+j2} **(6M)**

UNIT-III

5. **a**. What are the steps to design an analog Chebyshev low pass filter **(6M)**

b. Apply bilinear transformation to

$$H(s) = \frac{2}{(s+1)(s+2)}$$ with T=1 Sec and find H (z). **(6M)**

(OR)

6. **a.** Design a chebyshev filter with maximum passband attenuation of 2.5dB at 20rad/sec and stop band attenuation of 30dB at 50rad/sec **(6M)**

b. Compare Chebyshev and Butterworth Approximations. Sketch their pole locations for a third order filter. **(6M)**

UNIT-IV

7. **a**. Explain the Hamming window technique to design FIR Filter. **(6M)**

b. Design an ideal low pass filter with frequency response

$$H_d(e^{jw}) = 1 \text{ for } -\Pi/2 \le \omega \le \Pi/2$$
$$= 0 \text{ for } -\Pi/2 \le |\omega| \le \Pi/2.$$

Find the values of h(n) for N=11 and plot the frequency response. **(6M)**

(OR)

8. **a.** Discuss clearly the concept of linear phase in FIR filter design . **(6M)**

b. Explain clearly about the Kaiser window technique to design an FIR Filter. **(6M)**

UNIT-V

9. **a**. Explain the architecture of TMS 320C5X **(6M)**

b. What are the addressing modes of TMS 32050 **(6M)**

(OR)

10. **a.** What is a channel Vocoder. Explain its operation**.** **(6M)**

b. Explain briefly about Speech analysis and synthesis**.** **(6M)**

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Hall Ticket No: **Question Paper Code:**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES
(AUTONOMOUS)

III/IV B.Tech Sem-II Regular Examination April-2018

Electronic Measurements and Instrumentation (Elective-I)

(ECE)

Time: 3hrs **Max Marks:60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1 a) What are the different type of errors possible in measurements? Suggest methods to reduce their effect [**6M**]

b) Define the terms: Accuracy, Precision, Resolution and Limiting Error? [**6M**]

(**OR**)

2 a) Sketch the circuit diagram for a multi range voltmeter using
i) Individual multipliers resistors ii) Series-connected multiplier resistors [**6M**]

b) A PMMC instrument with FSD of 100μA and a coil resistance of 1KΩ is to converted into a voltmeter. Determine the required multiplier resistance if the voltmeter is to measure 50V at full scale. Also calculate the applied voltage when the instrument indicates 0.8, 0.5 and 0.2 of FSD [**6M**]

UNIT-II

3 a) How do you measure impedance using Vector Impedance Meter? [**6M**]

b) Draw the block diagram of Q-meter and explain its operation. Show the different arrangements for measuring large impedance ? [**6M**]

(**OR**)

4 a) Explain conversion technique used in successive approximation DVM with a block diagram [6M]

b) Explain the basic principle of a digital voltmeter with the help of block schematic diagram. Explain the difference between 4 digit and $3\frac{1}{2}$ digit voltmeter.? [**6M**]

UNIT-III

5 a) Explain the operation of a sampling oscilloscope with a neat block schematic diagram. What is its advantage over the conventional oscilloscope? [**6M**]

b) Derive the expression for vertical deflection of electron beam in CRT? [**6M**]

(**OR**)

6 a) With a neat sketch explain the operation of a heterodyne type wave analyzer ? [**6M**]

b) Explain the following terms associated with Spectrum Analyzer:
i) Sensitivity ii) Dynamic Range iii) Harmonic Mixing [**6M**]

UNIT-IV

7 a) Illustrate the method of measurement of unknown inductance by Maxwell's bridge ? [**6M**]

b) How Schering Bridge is used for the measurement of unknown capacitor? Derive its balance equation state it advantages? [**6M**]

(**OR**)

8 a) Why Kelvin's bridge is preferred? Derive the bridge balance equation for whetstone and Kelvin's bridge. ? [**6M**]

b) What is Wien's bridge? Derive the expression for the frequency ? [**6M**]

UNIT-V

9 a) Draw the block diagram of analog data acquisition system and explain the function of the components? [**6M**]

b) List out different types of Strain Gauges used Transducer and explain any one in detail? [**6M**]

(**OR**)

10 a) Draw the Linear variable differential Transducer and explain its operation in detail? [**6M**]

b) Draw the block diagram of telemetry system and explain its working ? [**6M**]

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Hall Ticket No: **Question Paper Code:**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

III/IV B. Tech II- Semester Regular Examinations April – 2018

MICROCONTROLLERS & EMBEDDED SYSTEMS

(ECE)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

1 . What are the advantages and disadvantages of microcontroller over microprocessor? With a neat sketch explain the architecture of 8051. [**12M**]

(**OR**)

2. a) How do you set the TH&TL values for TIMER 0 in mode 0 operation?
b) How do you set the registers TH&TL when changing the frequency of operation? [**12M**]

UNIT-II

3. a) Why the programmer must know about the CPU in order to program in assembly language
b) Explain about various addressing modes of 8051 [**3+9M**]

(**OR**)

4. a) Explain the shift an rotate instructions of 8051 with examples
b) Write an assembly language program to 8051 to rotate R1R0 registers to left by two positions treating R1R0 together as a 16-bit register. [**6+6M**]

UNIT-III

5. Use an 8-bit D/A converter which generates 1000Hz sine wave. 166 decimal samples are stored in a look up table and fed to the converter at a rate of one sample per 6 μ sec. The look-up table is pointed by DPTR and R1 is used to count the samples. Write assembly language program to initialize the D/A converter which is interfaced to 8051. [**12M**]

(**OR**)

6. Interface 4x4 matrix keypad to 8051 and display the key number on 7 segment display interfaced to same 8051. [**12M**]

UNIT-IV

7. a) What are common characteristics of Embedded Systems
   b) What must be recognized first in the implementation of a Processor on a IC. Explain different IC technologies. [**3+9M**]

(**OR**)

8. Write brief notes on the following in the context of Embedded processor technology.
   a) General purpose processors [**4+4+4M**]
   b) Single purpose processors
   c) Application purpose processors

UNIT-V

9. a) How can we change the PSR contents through instructions in ARM? Explain different PSR instructions in ARM.
   b) Explain how a constant is loaded into a general purpose register of ARM processor.
   c) What is Thumb state? [**5+5+2M**]

(**OR**)

10. Write a brief notes on [**6+6M**]
    a) CAN Bus architecture
    b) Programming model of ARM.

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Hall Ticket No: **Question Paper Code:**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2018

Microwave & Radar Engineering
(ECE)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT- I

1 a) Derive the expression for the guide wavelength of TE_{mn} mode in a rectangular wave guide. **(6M)**

b) A rectangular wave guide is filled by dielectric material of ε_r=9 and has dimensions of 7X3.5 cm. It operates in the dominant TE mode. **(6M)**

i. Determine the cut off frequency.
ii. Find the phase velocity in the guide at a frequency of 2 GHz.
iii. Find the guided wave length at 2 GHz.

(**OR**)

2 a) Distinguish between the properties of TEM mode of propagation and that of TE and TM type of propagation. **(6M)**

b) A rectangular guide of inner dimensions 2.5X1.2 cm is to propagate energy in TE10 mode. Calculate the cut off frequency. If the frequency of signal is 1.2 times this cut off frequency, compute the guide wavelength, phase velocity and wave impedance. Derive the relations used. **(6M)**

UNIT- II

3 a) Explain the principle of operation of an isolator and what the significance of using isolator in microwave circuits. **(6M)**

b) What is Faraday rotation? Explain the working of a ferrite circulator with neat sketches while mentioning about the applications. **(6M)**

(**OR**)

4 a) Why are s- parameters used at microwave frequencies explain: give the properties of S-parameters. **(6M)**

b) Explain the working of two hole directional coupler with a neat diagram. And also find its s-parameters. **(6M)**

UNIT- III

5 a) What are the limitations of conventional tubes at microwave frequencies? Explain how these limitations can be overcome. **(6M)**

b) Explain in detail bunching process in a two cavity klystron amplifier. **(6M)**

(**OR**)

6 a) Write a short note on cavity magnetron to operate in pi-mode. (**6M**)

b) Explain the Gunn effect, where by negative resistance, and therefore oscillations are obtainable under certain conditions from a bulk GaAs and similar semiconductors. (**6M**)

UNIT- IV

7 a) Draw a neat diagram of microwave test bench and explain about each block along with its features. (**4M**)

b) Explain the following methods for microwave frequency measurement (**8M**)

i) Slotted line method

ii) Resonant cavity method

(**OR**)

8 a) Explain the following techniques for microwave power measurement (**8M**)

i) Thermocouple detector

ii) Bolometer technique

b) Explain the RF substitution method of measurement of attenuation (**4M**)

UNIT- V

9 a) Derive the range equation for a radar system (**6M**)

b) Describe the sequential lobbing method of tracking of an acquired target (**6M**)

(**OR**)

10 a) Draw the block diagram and explain the working of MTI radar (**6M**)

b) Determine the peak power and duty cycle of a radar whose average transmitter power is 100 W, pulse width of 0.5μs and pulse repetition frequency of 2000 Hz. (**6M**)

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