Code No.: **40419**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Microprocessors and Microcontrollers**

Branch: **Common to EEE & ECE**

Time: **3 hours**   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. What is the difference between segment register and general purpose register?

2. What is an assembler directive? Give an example.

3. What is the need for interrupt controller?

4. What is a Microcontroller?

5. List out various flags in 8051

II. Answer ALL questions of the following   10x2Mark=20 Marks

1. Write the special functions carried by the general purpose registers of 8086.

2. Write the flags of 8086.

3. Define opcode and operand.

4. What is addressing? What are the various addressing modes available in 8086?

5. What are the different scan modes of 8279?

6. What is USART? What are the functions performed by INTEL 8251A?

7. Give the alternate functions for the port pins of port3?

8. List the features of 8051 microcontroller?

9. What are the addressing modes of 8051 microcontroller?

10. Write down the different operating modes for serial communication of 8051

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks

Q1.a) With a neat architectural diagram, explain the functioning of an 8086.

b) What is memory segmentation? Explain how segmentation provides effective task switching mechanism.

(OR)

Q2. a) Write the addressing modes of 8086 microprocessor with an example.

b) Explain the following 8086 instructions with examples

(i) MUL (ii) IMUL (iii) DIV (iv) IDIV

Q3. a) Write an ALP to find the multiplication of two 16-bit Hex numbers?

b) Explain the branch and call instructions of 8086 with examples.

(OR)

Q4. a) Write an 8086 program to perform the addition of two matrices.

b) What are the loop instructions of 8086? Explain the use of DF flag in the execution of string instructions.

Q5. a) Draw and explain 8251 USART architecture.

b) Draw a schematic to interface keyboard and display with 8086 using 8255 and explain.

(OR)

Q6. a) With neat diagrams, explain about I/O modes of 8255 (PPI).

b) Briefly explain about control words of 8259 (PIC).

Q7. a) With neat diagrams, explain about timers and counters in 8051 microcontroller.

b) Discuss briefly about RAM of 8051.

(OR)

Q8. a) Give the format of SCON register in 8051 and explain each bit in the format.

b) Explain the architecture of 8051 microcontroller.

Q9. a) With examples, describe the instruction set of 8051.

b) Briefly explain about the interrupt priorities in 8051.

(OR)

Q10 a) Write 8051 program to generate 2 kHz square waves on pin P1.0 of port 1 using Timer interrupt.

b) Write a 8051 assembly language program to find the largest number from an array of 10 numbers. The array is located in the data memory and the start address of Array is 20H.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: <u>Electronic Measurements And Instrumentation</u>

Branch: ECE

Time: 3 hours   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. What is precision?
2. What is total harmonic distortion and Give the equation to find out THD.
3. What are graticules?
4. Give the expression for gauge factor.
5. What is bridge and what is its importance?

II. Answer ALL questions of the following   10x2Mark=20 Marks

1. The expected value of the voltage across resistor is 100V. The measurement gives a value of 101V. Calculate absolute error and % error.
2. What is resolution? Explain with an example.
3. What is oscillator and test oscillator?
4. Explain why buffer amplifiers are used in laboratory type modern signal generator. Draw spectrum analyzer using parallel filter bank technique.
5. What is the difference between an analog storage oscilloscope and digital storage oscilloscope?
6. Why sampling oscilloscope is used for HF signals?
7. Give the classification of transducers.
8. Give examples of displacement transducers.
9. What are the different methods to measure liquid level?
10. What is absolute humidity and relative humidity?

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks

1. Draw Kelvin's double bridge circuit and derive the expression for unknown resistance.

(OR)

2. What is the difference between series type ohmmeter and shunt type ohmmeter? Write its related design values.
3. a) State the applications of a spectrum analyzer.
   b) Explain the working of arbitrary waveform generator.

(OR)

4. Explain the working of spectrum analyzer using parallel filter tank techniques.
5. Draw time base generator circuit and explain briefly.

(OR)

6. Explain the working of dual beam CRO with a neat block diagram.
7. Draw Piezoelectric Transducer and explain its operation briefly.

(OR)

8. Explain the following (a) Capacitive transducer (b) Inductive Transducer.

9. a) Explain briefly different types of angular velocity transducers.
   b) What is data acquisition? Explain with block schematic of digital data acquisition system.

(OR)

10. What are the basic tasks of the DAS? Explain briefly the difference between analog and digital DAS.

Code No.: **40417**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: <u>**DIGITAL COMMUNICATIONS**</u>

Branch: ECE

Time: 3 hours   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. Define baseband modulation.
2. Compare Bandwidth requirements QPSK and BPSK.
3. What is the Optimum Receiver?
4. What are the properties of binary cyclic codes?
5. How chip duration is related to measurement accuracy in ranging by DS spread spectrum?

II. Answer ALL questions of the following   10x2Mark=20 Marks

1. What is the necessity of non uniform Quantization?
2. In a binary PCM, if bit '0' occur with probability $1/4$ and bit '1' occur with probability $3/4$. Then calculate amount of information carried by each bit.
3. Draw the phasor and constellation diagram of QPSK?
4. Briefly discuss the generation of ASK signal?
5. State Shanon's source coding theorem.
6. What is average information and write expression for it?
7. Compare linear block codes, cyclic codes and convolutional codes.
8. What are the advantages and disadvantages of convolution codes?
9. State the principle of DSSS.
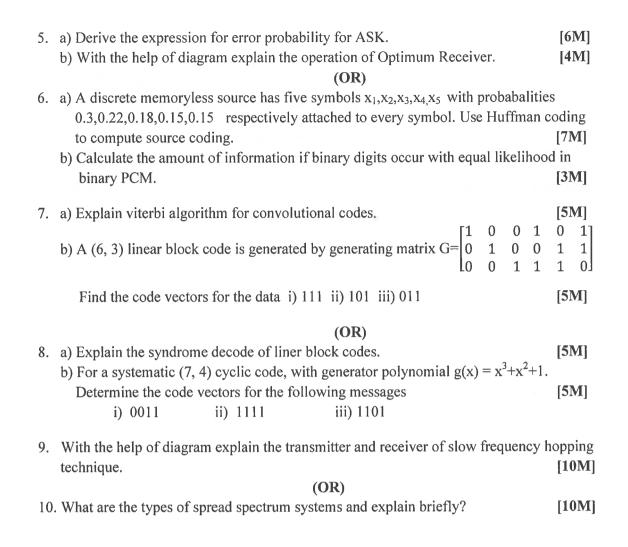10. What is the use of spread spectrum?

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks

1. a) Explain delta modulation with block diagram and discuss different types of noise
      effects in delta modulation.   [7M]
   b) What is μ-law and explain its significance?   [3M]

(OR)

2. a) Discuss the advantages and disadvantages of digital communication and give a
      functional description of a digital communication system.   [7M]
   b) State sampling theorem for band pass signals.   [3M]

3. a) Draw the diagram of DPSK receiver and explain its operation.   [7M]
   b) Compare Psd and Bandwidth of FSK with that of BPSK.   [3M]

(OR)

4. a) Explain the operation of QPSK receiver with Block diagram.   [7M]
   b) In a digital CW communication system, the bit rate of NRZ data stream is 1 Mbps and
      carrier frequency is 100 MHz. Find the Symbol rate transmission and bandwidth
      requirement of the channel for BPSK system.   [3M]

5. a) Derive the expression for error probability for ASK. [6M]
   b) With the help of diagram explain the operation of Optimum Receiver. [4M]

(OR)

6. a) A discrete memoryless source has five symbols x_1, x_2, x_3, x_4, x_5 with probabalities 0.3,0.22,0.18,0.15,0.15 respectively attached to every symbol. Use Huffman coding to compute source coding. [7M]
   b) Calculate the amount of information if binary digits occur with equal likelihood in binary PCM. [3M]

7. a) Explain viterbi algorithm for convolutional codes. [5M]
   b) A (6, 3) linear block code is generated by generating matrix G=$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$

   Find the code vectors for the data i) 111 ii) 101 iii) 011 [5M]

(OR)

8. a) Explain the syndrome decode of liner block codes. [5M]
   b) For a systematic (7, 4) cyclic code, with generator polynomial $g(x) = x^3+x^2+1$.
   Determine the code vectors for the following messages [5M]
      i) 0011   ii) 1111   iii) 1101

9. With the help of diagram explain the transmitter and receiver of slow frequency hopping technique. [10M]

(OR)

10. What are the types of spread spectrum systems and explain briefly? [10M]

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018
Subject: DIGITAL SIGNAL PROCESSING
Branch: ECE

Time: 3 hours   **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following   **5x1Mark=5 Marks**

1. Define one sided Z- transform.
2. Write the conditions for applying DFS.
3. What is prewarping in digital filters?
4. What are the different types of filters based on impulse response?
5. What is meant by truncation?

II. Answer ALL questions of the following   **10x2Mark=20 Marks**

1. What are the different types of signal representations?

2. Draw the parallel form structure of IIR filters.

3. Draw a two point butterfly diagram in DIT-FFT and DIF-FFT.

4. What is the difference between decimation in time and decimation in frequency?

5. Why the butterworth filter response is maximally flat response.

6. Why impulse invariant method is not preferred in design of high pass IIR filter.

7. What are the differences between FIR and IIR filters?

8. What are the various types of windows?

9. What is the difference between floating point and fixed point representation?

10. Draw the spectrum of the upsampled signal?

PART-B

Answer ALL questions of the following   **5x10 Marks= 50Marks**

1. Realize the following system with transfer function

$$H(Z) = \frac{1-(1/4)Z^{-1}}{1-(1/9)Z^{-2}} \quad \text{in cascade form and parallel form.}$$

(OR)

2. Determine the impulse response of the system described by difference equation

$Y(n) - \frac{1}{6} y(n-1) - \frac{1}{6} y(n-2) = x(n)$.

3. Develop a radix-2,8-point DIT FFT algorithm with neat flow chat.

(OR)

4. Determine linear convolution of two sequencies x(n)={1,2} and h(n)={2,1} using DFT/IDFT method.

5. Given the specifications α_p= 3dB, α_s= 16dB, f_p=1kHz & f_s=2kHz. Determine the order of the filter using chebyshev approximation.

(OR)

6. State and explain analog filter using Butterworth approximation technique.

7. Develop an ideal high pass filter using hamming window with a frequency response

$$H_d(e^{jw}) = \begin{cases} 1 \ for \frac{\pi}{w} \leq |w| \leq \pi \\ 0 \ for |w| \leq \pi/4 \end{cases}$$

Assume N=11

(OR)

8. Determine the filter coefficients of linear phase FIR with cut off frequency of 0.5π rad/sec by taking 9 samples using frequency sampling method.

9. Consider a second order 11R filter with

$$H(z) = \frac{10}{(1-0.5z^{-1})(1-0.45z^{-1})}$$

Find the effect on quantization on pole locations of the given system function in direct form & in cascade form. Take b=3bits.

(OR)

10. a) Discuss the effects due to finite word length in direct form I and II structures.

b) For the multirate system shown, develop an expression for the output y(n) as function of input x(n).