

M.TECH. (ECE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: ADVANCED MICROPROCESSOR & MICROCONTROLLERS)
(PAPER CODE: 13130101)

TIME: 03:00 Hrs.**Max. Marks: 100****Instructions:-**

1. Write your Roll no. on the Question paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regards, If any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Explain the followings:**(4x5=20)**

- a) Discuss input/output capability of a microprocessor.
- b) Addressing modes in a microprocessor.
- c) Embedded microcontroller.
- d) Features of Motorola microprocessor.

UNIT-I

Q.2. Discuss various features of a microprocessor which play a vital role in order to decide the scope in real time applications.

(20)

Q.3. How can you interface an analog to digital convertor to the microprocessor? Describe in detail with suitable interfacing diagram.

(20)**UNIT-II**

Q.4. Differentiate polling and interrupt. How can you measure the performance in the term of interrupt handling capability of a microprocessor?

(20)

Q.5. What is the design process to develop a microprocessor based system? Also prepare the specification of a microprocessor based system.

(20)**UNIT-III**

Q.6. Describe the Internal RAM structure & register structure for 8051 microcontroller. Also describe Ram Mapping.

(20)

Q.7. Describe various design tools for microcontroller based real time applications.

(20)**UNIT-IV**

Q.8. Discuss Motorola 68XXX family of microprocessor in detail. Also explain common architecture for Motorola 68XXX microprocessor.

(20)

Q.9. Discuss following in detail:-

(10+10=20)

- a) Serial Interface.
- b) UART modems

**M.TECH. (ECE) – 3rd SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: NEURAL NETWORK & FUZZY LOGIC; PAPER CODE: 13130301)**

TIME: 03:00 Hrs.**Max. Marks: 100****Instructions:-**

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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

- Q.1. Explain the followings: (4x5=20)**
- a) Describe the model and topology of a Neuron.
 - b) Differentiate between supervised and unsupervised learning.
 - c) Explain counter propagation networks.
 - d) List and describe the Membership functions of fuzzy logic.

UNIT-I

- Q.2. Describe the following models of an artificial neural network (i) Feedforward, (ii) Feedback and (iii) Hopfield model. Explain the energy minimization function used in the Hopfield model. (20)**
- Q.3. What is a self-organizing map? Explain Kohonen's self-organizing maps. (20)**

UNIT-II

- Q.4. Describe how neural networks can be applied in the area of pattern recognition. Describe finger print detection using neural networks. (20)**
- Q.5. Define (i) Recurrent Back Propagation and (ii) RBF Networks. Compare the RBF network with Multilayer perception. (20)**

UNIT-III

- Q.6. Describe the (i) CMAC and (ii) ART type of artificial neural networks. (20)**
- Q.7. Describe the concept of Associative memories. Explain the use of retrieval and storage algorithms in an associative memory. (20)**

UNIT-IV

- Q.8. Differentiate between fuzzy and crisp set. What is meant by de-fuzzification? Describe with an example the basic fuzzy inference algorithm. (20)**
- Q.9. Explain Fuzzy If-Then rules. Explain in detail the application of fuzzy logic in implementing the Anti-Lock Braking System. (20)**

M.TECH. (ECE) – 3rd SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: CDMA SYSTEM; PAPER CODE: 13130302)

TIME: 03:00 Hrs.**Max. Marks: 100****Instructions:-**

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Explain the followings:**(4x5=20)**

- a) What is frequency hopped spread spectrum?
- b) What is CDMA Systems?
- c) What is Soft Handoffs?
- d) What is Error probability for DS-CDMA?

UNIT-I**Q.2. What are the various Spreading /coding tradeoffs, describe them?****(20)****Q.3. What do you mean by AWGN channel? Derive expression for computing the error probability for DS-CDMA on AWGN channels.****(20)****UNIT-II****Q.4. Why power control is essential in CDMA systems? Explain reverse link closed loop power control with suitable diagram.****(20)****Q.5. Write short notes on followings:-****(20)**

- a) Performance analysis of cellular CDMA
- b) Multi-user detection

UNIT-III**Q.6. Write short notes on followings:-****(20)**

- a) Capacity estimation of CDMA
- b) DS CDMA

Q.7. What are different types of Hand-off in CDMA System? Give benefits of soft hand-off.**(20)****UNIT-IV****Q.8. Explain the third generation CDMA systems in details.****(20)****Q.9. Write short notes on followings:****(20)**

- a) Multi Carrier CDMA
- b) IS-95

M.TECH. (ECE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: SATELLITE & SPACE COMMUNICATION; PAPER CODE: 13130102)

TIME: 03:00 Hrs.

Max. Marks: 100

Instructions:-

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

- Q.1. Explain the followings: (4x5=20)**
- a) Active and passive satellite.
 - b) What are LEO, MEO, GEO satellites?
 - c) Atmospheric effects on satellite communication.
 - d) Satellite frequency allocation.

UNIT-I

- Q.2. State and explain Kepler's law and also derive the expression for velocity of satellite in its orbit. (20)**
- Q.3. Explain the History of satellite communication. (20)**

UNIT-II

- Q.4. What are the Telemetry, Tracking and command of satellites explain each with diagram. (20)**
- Q.5. Derive general link design equation also explain its importance. (20)**

UNIT-III

- Q.6. Explain in details Coherent detection. (20)**
- Q.7. What is QPSK Technique? Explain. (20)**

UNIT-IV

- Q.8. Describe the general operating principal of a TDMA network. Show how bit rate of transmission is related with the input bit rate. (20)**
- Q.9. Write a short note on any two of the followings:- (20)**
- a) DTH system.
 - b) INTELSAT
 - c) VSAT

M.TECH. (ECE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: INFORMATION AND COMMUNICATION THEORY; PAPER CODE: 13130103)

TIME: 03:00 Hrs.

Max. Marks: 100

Instructions:-

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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

- Q.1. Explain the followings: (4x5=20)**
- a) Define Entropy.
 - b) Explain Shannon Theorem.
 - c) Explain BSH codes.
 - d) Differentiate between discrete & continuous entropy.

UNIT-I

- Q.2.** a) What do you understand by detection and correction of errors? (10)
 b) Derive Shannon theorem. (10)
- Q.3.** a) Write a note on Hamming code. (10)
 b) Explain Reed Solomon Codes. (10)

UNIT-II

- Q.4.** Write a note on Convolution code. (20)
- Q.5.** The generator matrix for a(6,3) block code is given below. Find all the code vector of this code: 1 0 0 : 0 1 1. (20)
 $G = 0\ 1\ 0 : 1\ 0\ 1\ 0\ 0\ 1 : 1\ 1\ 0$

UNIT-III

- Q.6.** Write a note on Convolution Code. (20)
- Q.7.** What are generator and parity check matrices? (20)

UNIT-IV

- Q.8.** Explain Viterbi decoding algorithm. (20)
- Q.9.** Explain evaluation performance of:- (10+10=20)
 a) Linear Block Codes.
 b) Convolution Codes

M.TECH. (ECE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: ADVANCED DIGITAL SIGNAL PROCESSING; PAPER CODE: 13130104)

TIME: 03:00 Hrs.

Max. Marks: 100

Instructions:-

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

- Q.1. Explain the followings:** (4x5=20)
- a) Types of signals.
 - b) Any five properties of Fourier transform.
 - c) Linear and circular convolution.
 - d) FIR and IIR filters.

UNIT-I

- Q.2.** What is the meaning of signal processing? Define stability and causality criteria. Explain the design of low pass filter using impulse invariance method. (20)
- Q.3.** Define filters. Explain the cascade and parallel realization of digital filters with example. (20)

UNIT-II

- Q.4.** Define Fourier transforms. Find the Fourier transform of following functions: (20)
 (i) $x(t)=e^{-at} u(t)$ (ii) $x(t)=e^{-at} \cos \omega_0 t u(t)$
- Q.5.** Explain inverse Fourier transform with example and prove any five properties. (20)

UNIT-III

- Q.6.** Define Z-transform. Find Z-transform of following function: (20)
 (i) $x(n)=n a^n u(n)$ (ii) $x(n)=a^n u(n)$ and also find ROC of both functions.
- Q.7.** What is inverse Z-transform? Write its properties. Find the inverse Z-transform of following using partial fraction method: (20)

$$F(z) = (2z^2+1)/(z^2-1.5z+0.5)$$

UNIT-IV

- Q.8.** Explain the block diagrams of FIR and IIR filters and specifications of these filters. (20)
- Q.9.** a) Explain the steady state response of filters. (10)
 b) Explain amplitude and phase characteristics of filters (10)

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Roll No. _____

M.TECH. (ECE) – 3rd SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: DIGITAL SIGNAL PROCESSORS & APPLICATION; PAPER CODE: 13130308)

TIME: 03:00 Hrs.

Max. Marks: 100

Instructions:-

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

- Q.1. Explain the followings: (4x5=20)**
- a) Interrupt and mode control of DSP 56002.
 - b) Data organization in memory of DSP56002.
 - c) Block diagram of FIR filter.
 - d) Memory organization of TMS-320.

UNIT-I

- Q.2. Draw the block diagram of DSP 56002 and explain its features. (20)**
- Q.3. Explain address generation unit and addressing modes of DSP 56002. (20)**

UNIT-II

- Q.4. Write the instruction format of DSP56002. Explain arithmetic and bit manipulation instruction of DSP 56002. (20)**
- Q.5. Explain parallel move types and instruction set of DSP56002. (20)**

UNIT-III

- Q.6. Explain the applications of DSP processor in designing and implementing FIR filter. (20)**
- Q.7. Explain the applications of DSP processor in designing and implementing IIR filter. (20)**

UNIT-IV

- Q.8. Explain the architecture of TMS-320. (20)**
- Q.9. Draw the block diagram of TMS-320 and explain instruction set (20)**

M.TECH. (ECE) – 1ST SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: ADVANCED MATHEMATICS FOR ENGINEERS; PAPER CODE: 13130108)

TIME: 03:00 Hrs.

Max. Marks: 100

Instructions:-

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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Explain the followings: (4x5=20)

- a) Describe the relationship between Fourier and Laplace Transforms. Find the Fourier transform of $f(x) = e^{-2(x-3)^2}$.
- b) Describe with equations, the time scaling and time shifting properties of Z-transforms.
- c) Describe the Jacobins and Gaus-Siedal methods of iteration and list any one difference between the two methods.
- d) Using Euler's equation and Lagrange multiplier, find the plane curve of fixed perimeter and maximum area.

UNIT-I

Q.2. a) Find the Fourier Sine and Cosine Transform of the following:- (10)

(i) $f(x) = x^{n-1}, n > 0$

(ii) $f(x) = xe^{-ax}$

b) Describe and prove the Modulation and Convolution theorems for Fourier Transforms. (10)

Q.3. Using Parseval's identities, prove that:- (20)

(i) $\int_0^{\infty} \frac{dt}{(a^2+t^2)(b^2+t^2)} = \frac{\pi}{2ab(a+b)}$

(ii) $\int_0^{\infty} \frac{t^2}{(t^2+1)^2} dt = \frac{\pi}{4}$

(iii) $\int_0^{\infty} \frac{\sin at}{t(a^2+t^2)} dt = \frac{\pi}{2} \cdot \frac{1-e^{-a^2}}{a^2}$

UNIT-II

Q.4. a) Show that $Z\left(\frac{1}{n}\right) = e^{\frac{1}{z}}$. Hence, Evaluate $Z\left[\frac{1}{n+2}\right]$. (10)

b) Using Convolution theorem, evaluate the inverse Z-transform of $\left(\frac{z}{z-a}\right)^2$. (10)

Q.5. a) Find the Z-transform of the following:- (10)

(i) $Z(n) = 3n - 4 \sin \frac{n\pi}{4} + 5a$

(ii) $(n+1)^2$

(iii) $\sin(3n+5)$

P.T.O.

b) Find the Inverse Z-transform of the following:- (10)

(i) $U(z) = \frac{z}{z^2+2z+1}$

(ii) $U(z) = \frac{2z^2+3z}{(z+2)(z-4)}$

(iii) $U(z) = \frac{u^3-20z}{(z-2)^3(z-4)}$

UNIT-III

Q.6. a) Solve by Gauss elimination method:- (10)
 $2x + y + 4z = 12;$ $8x - 3y + 2z = 20;$ $4x + 11y - z = 33$

b) Find the largest Eigen value and the corresponding Eigen-vector of the matrix. (10)

$$\begin{bmatrix} 1 & 3 & -1 \\ 3 & 2 & 4 \\ -1 & 4 & 10 \end{bmatrix}$$

Q.7. a) Solve by Crout's method:- (10)
 $2x + 3y + z = 9;$ $x + 2y + 3z = 6;$ $3x + y + 2z = 8$

b) Solve the following equations using the Gaus-Siedal method. The answer should be correct to 3 significant digits:- (10)
 $9x + 2y + 4z = 20;$ $x + 10y + 4z = 6;$ $2x - 4y + 10z = -15$

UNIT-IV

Q.8. a) State and prove the Brachistochrone problem. (10)

b) Find the bi-linear transformation which maps the points $z = 2, i, -2$ on to the points $w = 1, i, -1$. (10)

Q.9. a) Use Lagrange's interpolation formula to find $y(2)$ for the data given below:- (10)

X	1	3	4	6
Y	-3	9	30	132

b) Describe what is meant by Isoperimetric problems. How are these problems solved? Prove that the sphere is the solid figure of revolution which, for a given surface area, has maximum volume. (10)

M.TECH. (ECE) – 3rd SEMESTER EXAMINATIONS; JANUARY-2018
(SUB.: COMPUTER COMMUNICATION; PAPER CODE: 13130310)

TIME: 03:00 Hrs.**Max. Marks: 100****Instructions:-**

1. Write your Roll no. on the Question paper.
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3. Attempt Five (05) Questions in all, Question No.-01 is Compulsory. Students are required to attempt One (01) question from each Unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

Q.1. Explain the followings:**(4x5=20)**

- a) Discuss features of a Computer Communication system.
- b) Explain various IEEE standards for LAN.
- c) How cryptography play a vital role in secured communication system?
- d) What is the Burke's Theorem?

UNIT-I

Q.2. What is switching? Discuss various types of switching techniques in detail with appropriate diagrams? (20)

Q.3. What are the basics of OSI & TCP/IP reference model? Describe their architecture with functioning detail? (20)

UNIT-II

Q.4. What are the design issues of data link layer? Explain the functioning & its associated protocols with their frames. (20)

Q.5. Explain the IP addressing schemes in detail? How IPv6 is better than IPv4? Discuss the sub-netting also. (20)

UNIT-III

Q.6. What are the design issues of transport layer & application layer? Discuss their protocols in detail? (20)

Q.7. Describe various cryptography techniques in detail. Discuss Digital signature also. (20)

UNIT-IV

Q.8. Discuss Modeling and Analysis of Computer Communication Networks? Use suitable example. (20)

Q.9. What are the different Queuing Models? Explain various possible models in detail? (20)
