Te sem-VI MM-II T.E (Sem VI) OLD

EXTC 19/11/15 EXTC Sub:- MM-II

QP Code : 1882

Time 3 Hrs

Max. Marks 100

Note: Question no. 1 is compulsory.
Answer any four from Q.2 to Q.7
All questions carry equal marks.

Dec 15

Q.1 A Design 8086 microprocessor based system with following specification 10
a) Microprocessor 8086 working at 10 MHz
b) 64 KB EPROM using 16 KB chips
c) 8 KB SRAM using 4 KB chips
Explain the design.

B Explain memory organisation of PIC 18. 10

Q.2 A Discuss different instruction formats of PIC 18. 10

B Draw timing diagram for read operation in minimum mode of 8086 and explain it. 10

Q.3 A Interface 8087 NDP with 8086 microprocessor and explain their communication. 10

B Explain different data transfer modes of 8257 DMA controller. 10

Q.4 A What is addressing mode and explain data related addressing modes of 8085 microprocessor. 10

B Draw port structure of PIC 18 and explain. 10

Q.5 A Explain interrupts structure of 8085 microprocessor. 10

B List different addressing modes of PIC 18 with examples. 10

Q.6 A Write assembly language program for 8086 microprocessor to find out largest elements out of 10 elements. 10

B With the help of neat diagram explain interfacing of six, 7 segment displays with PIC 18. 10

Q.7 A Write note on 10
i) Cascading of three 8259s
ii) Assembler directives
iii) Bus controller 8288
iv) Features of 80386

DC

TE Sem VI (CBGS)

EXTC 19/11/15

EXTC

Date: 19/11/15

Sub:- DC

Q.P.No. : **6278**

Duration: 3 Hrs

Total Marks: 80

N.B: Question No 1 is compulsory.
Attempt any three questions out of remaining five.
All questions carry equal marks
Assume Suitable data, if required and state it clearly.

Q1) (20)

a) Describe in brief four types of Trade-Offs that can be accomplished by using Error correcting code.
b) How is signal bandwidth spread in spread spectrum modulation?
c) What is Entropy of an information source? When is entropy maximum?
d) What is gram Schmitt orthogonalization procedure? Explain?
e) Distinguish between Matched filter and Correlator.

Q2) a) Consider a DMS $S = (S_1, S_2, S_3 \ldots S_7)$ with following message probabilities (10)

S_i	S_1	S_2	S_3	S_4	S_5	S_6	S_7
$P(s_i)$	0.40	0.25	0.15	0.10	0.05	0.03	0.02

Encode the source using Huffman algorithm. Find the average code length and efficiency.

b) Explain the necessity of line codes for data transmission. State different types of line codes. Plot power spectral density of NRZ signal. (10)

Q3) a) State and explain maximum likelihood decision rule. Explain the function of correlator receiver. (10)

b) Derive the expression for error probability of BPSK system with coherent detection. (10)

Q4) a) Draw and explain the block diagram of OQPSK transmitter. Sketch the waveforms at the output of each block of the transmitter. (10)

b) Consider a (7, 4) code whose generator matrix is (10)

$$G = \begin{matrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 & 1 \end{matrix}$$

1) Find H, the Parity – Check matrix of the code.
2) Compute the syndrome for the received vector 1 1 0 1 1 0 1.Is this a valid code vector?

Q5)a) Design Encoder for an (8,5) cyclic code with generator $g(x) = 1+x+x^2+x^3$.Use this encoder to find the code word for the message (10101) in systematic form. (10)

b) Draw the state Diagram and Tree diagram for L= 3, rate $=\frac{1}{3}$ convolution encoder generated by $g_1(x) = x+x^2$, $g_2(x) = 1+x$, $g_3(x) = 1+x+x^2$. (10)

Q6) a) What are two basic types of spread spectrum systems? Explain the basic principle of each of them. (10)

b) Explain in detail 16-QAM transmitter and receiver system .Draw and explain signal constellation diagram for 16-QAM. (10)

Te Sem-VII (old) Nov-DE, EXTC (old) AWP

26.11.15

Sub:- AWP

EXTC

QP Code : **1927**

(3 Hours) [Total Marks : 100

N.B. : (1) Question No.1 is compulsory
(2) Answer any four questions from the remaining six questions.
(3) Assume any suitable data wherever required.
(4) Figures to the right indicate full marks.

1. Answer the following : 12
   (a) Maxwell's equation's for harmonic variations
   (b) Ground interference effects
   (c) Explain different types of antenna losses
   (d) FRIIS transmission formula

2. (a) Derive the expression for radiation resistance of an infinitesimal dipole, explain its significance. 10
   (b) Explain the significance of the term "Effective Area of an Antenna". Derive the relationship between effective area and directivity of any antenna. 10

3. (a) Derive the array factor of an N- element uniform linear array and hence deduce the condition for which the array will radiate in the broadside and end fire direction 10
   (b) What is folded dipole antenna? Explain its operation, equation, properties and applications 10

4. (a) Explain with suitable diagram the working of Log Periodic Antenna. Write its practical applications. 10
   (b) Explain the different types of horn antennas. Find its directivity and beamwidth. 10

5. (a) Draw and explain Yagi antenna. Sketch its radiation pattern. Write the applications of Yagi Antenna. 10
   (b) Explain the different components of the ground waves. What are frequency characteristics of ground waves? 10

6. (a) Explain the principal modes of operation of helical antennas and draw its radiation pattern. 10
   (b) Explain the mechanism of isotropic propagation. Define critical frequency, MUF and OWF. 10

7. Write notes on 20
   (a) Retarded potential and its applications
   (b) Sleeve dipole
   (c) The equivalent noise temperature of an antenna
   (d) Dielectric waveguide.

TE Sem-VI (CBGS) TE EXTC CBGS
DTSP 26.11.15

EXTC Sub:-DTSP

QP Code : **6320**

(3 Hours) [Total Marks :80

N.B. : (1) Question no. 1 is compulsory.
(2) Solve any three questions from remaining five questions.
(3) In all four questions to be attempted.
(4) Figures to the right indicate full marks.

1. (a) The first five points of eight point DFT of real valued signal are {0.25, 0.125 -j0.3018, 0, 0.125-j0.0150, 0}. Determine the remaining three points. 20

(b) Sketch the frequency response and identify the following filters based on their passband

(i) $h(n)=\left\{1,-\frac{1}{2}\right\}$

(ii) $H(z)=\frac{z^{-1}-a}{1-az^{-1}}$

(c) What is multirate DSP? State its applications

(d) An analog filter has transfer function

$$H(s)=\frac{S+0.1}{(S+0.1)^2+16}$$

Determine transfer function of digital filter using bilinear transformation.

The digital filter should have a specification of $\omega_c=\pi/2$

2. (a) Compute DFT of sequence $x(n)=\{1, 2, 2, 2, 1, 0, 0, 0\}$ using DIT-FFT algorithm. 10

(b) Explain the effects of coefficients quantization in FIR filters. 10

3. (a) Implement a two stage decimator for the following specification: 10
Sampling rate of the input signal = 20,000Hz,
Decimating factor $M = 100$,
Passband = 0 to 40Hz,
Passband ripple = 0.01,
Transition band = 40 to 50Hz,
Stop band ripple = 0.002

(b) (i) If $x(n) = \{1 + 2j, 3 + 4j, 5+6j, 7+8j\}$. Find DFT X(k) using DIF-FFT algorithm. 10

[TURN OVER

MD-Con.8410-15.

4. (a) Explain upsampling process in detail and derive for input-output relationship in time domain and frequency domain. 10

(b) Obtain cascade and parallel realization structures for the system described by $y(n) = -0.1y(n-1) + 0.72y(n-2) + 0.7\,x(n) - 0.252\,x(n-1)$ 10

5. (a) Design a FIR digital filter using window method for following specifications. 1

$$H(e^{j\omega}) = e^{-j3\omega} \quad 0 \le |\omega| \le \frac{3\pi}{4}$$
$$= 0 \quad \text{otherwise}$$

Use Hamming window of length 7

(b) Design a digital low pass IIR Butterworth filter for the following specification

Passband ripple	:	≤ 1 dB
Passband edge	:	4 KHz
Stopband attenuation	:	40 dB
Stop edge	:	8 KHz
Sampling Rate	:	24 KHz

Use bilinear transformation

6. (a) Write a short note on:
   (i) Dual tone multi frequency signal detection
   (ii) Different methods for digital signal synthesis

(b) Determine the zeros of the following FIR systems and indicate whether the system is minimum phase, maximum phase or mixed phase.

(i) $H_1(z) = 6 + z^{-1} - 6z^{-2}$

(ii) $H_2(z) = 1 - z^{-1} - 6z^{-2}$

(iii) $H_3(z) = 1 - \frac{5}{2}z^{-1} - \frac{3}{2}z^{-2}$

(iv) $H_4(z) = 1 - \frac{5}{2}z^{-1} - \frac{2}{3}z^{-2}$

Comment on stability of minimum and maximum phase system

EXTC/ Sem VI (old)/ DC Nov-Dec-15

02/12/15

EXTC Sub: DC

Q.P. Code : **1980**

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of the remaining five questions.
(3) Draw **diagrams** wherever **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. Attempt any 4
   (a) In Digital Communication Eb/No is the parameter considered rather than S/No. Justify. 5
   (b) Explain Shannon Hartley Theorem. 5
   (c) Derive the condition for maximum entropy of a source. How does it vary with probability? 5
   (d) Assess the different parameters for choosing a PCM waveform type. 5
   (e) Compare - 5
      (i) Systematic and Non-Systematic Codes
      (ii) 16-PSK and 16-QAM

2. (a) Draw the block diagram of OQPSK transmitter. A bit stream b(t) = 001011011010 is to be transmitted. Sketch the waveform at the o/p of each block. 8
   (b) Explain the transmitter and receiver of a DEPSK system with a block diagram. Interpret why errors occur in pairs in a DEPSK system? Support with a suitable example. 8
   (c) Describe the properties of Matched Filter. 4

3. (a) Derive expression for probability of error for an Optimum Filter. Hence derive the Transfer Function of an Optimum Filter. 10
   (b) Explain the concept of QAM. Draw and Explain QAM transmitter and receiver. 10

4. (a) For K=4, 1/3 rate convolution encoder, the generator vectors are given as $g_1 = (1000)$, $g_2 = (1111)$ and $g_3 = (1011)$. Draw the block diagram of the encoder. Draw the code tree for the same. If the input bit stream to the encoder is given by the 4 bit sequence 1011, find the coded output bit stream. 10
   (b) The generator polynomial for a (7,4) systematic cyclic code is $x^3 + x^2 - 1$. Find the code polynomial for message vector 1111 and hence the coded vector. Assuming it suffers transmission error, find the syndrome at the receiver. 10

[TURN OVER

5. (a) A DMS 'S' produces the symbols A, B, C and D with probabilities 0.4, 0.25, 0.15 and 0.20 respectively. **10**
   (i) Justify whether the output of this source can be compressed so that the average code word length is 2 bits.
   (ii) Create a Huffman code for this source and calculate its efficiency.

   (b) The binary data [1 0 111 0 0 1 0 1] is applied at the input of a modified duo-binary encoder. **10**
   (i) Prepare the encoder and decoder output without precoding.
   (ii) Suppose during transmission, the 3rd bit is in error. Construct the receiver output.
   (iii) Recommend a technique to avoid error propagation and illustrate how this can be achieved.

6. (a) Derive the PSD for a Unipolar NRZ waveform. **10**
   (b) For a (6,3) systematic linear code, the parity check digits are given as **10**

$$C_4 = d_1 + d_2 + d_3$$
$$C_5 = d_1 + d_2$$
$$C_6 = d_1 + d_3$$

   (i) Find the generator matrix.
   (ii) Obtain the code vectors.
   (iii) Determine error detection and correction capabilities.
   (iv) Decode received word 000111.

7. Write a short note on - (any 4) **20**
   (i) Veterbi Decoding
   (ii) Lempel Ziv Coding
   (iii) Equalization
   (iv) BCH Codes
   (v) Eye Pattern

EXTC / Sem VI / CBGS / CCTN

02/12/15

Sub: CCTN

EXTC

QP Code : 53653

(3 Hours) [Total Marks :80

N.B. : (1) Question No.1 is compulsory
(2) Write any three question from Q.2 to Q.6
(3) Draw neat diagram if necessary

1. Solve following
(a) Compare between pure ALOHA and Slotted ALOHA
(b) Explain working principle of selective repeat ARQ
(c) What is the use of subnetwork in IP addressing
(d) What is bit and byte stuffing explain with example

2. (a) Discuss various scheduling methods used in MAC
(b) Explain need of fragmentation and field related to fragmentation in IP datagram

3. (a) Solve the following related of IP datagram
(a) Which field shows number of hop count
(b) If HLEN value is 5 and length of data is 24 bytes. Calculate option
(c) What are differentiate services?
(d) Packet version of IP is discarded. Justify
(b) Draw and explain connection establishment using 3 way handshaking in TCP

4. (a) What is DSL and HFC? Describe in brief
(b) What is IEEE 802.11? Explain features of IEEE 802.11. Draw the architecture of IEEE 802.11

5. (a) What do you mean by asynchronous port is use file sharing? How it is different from centralized system
(b) What are the components of URL? Explain in brief
(c) What is the role of CMIP protocol? Explain the error messages of CMIP

6. (a) An ISP are granted a block of address starting with 120.30.4.0/20. The ISP wants with each organization receiving 8 address and design subnets and give the used address for each subnets
(b) What protocol gives mapping of name with IP address? Explain working of such protocol with different methods

MD-Con. 9488 -15.

Sem VI (old) EXTC (old) TV Nov-Dec-15
08/12/2015

EXTC Sub:-TV

QP Code : 2025

(3 Hours) [Total Marks : 100

N.B. : (1) All questions are compulsory
(2) Figures to the right indicate full marks.
(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.

1. (a) Explain why (G-Y) is not transmitted in colour Television system. 20
(b) Compare NTSC and PAL System.
(c) Why aspect ratio is 4:3 chosen for T.V.
(d) Explain how monochrome and colour TV are made compatible.

2. (a) Draw block diagram of monochrome receiver and explain. 20
(b) Draw and Explain chromaticity diagram.

3. (a) (i) Draw composite video signal and label different parts of the same. 20
(ii) Explain why vertical synchronsing pulse is selected.
(b) Draw and explain different sections of Image Orthicon camera tube.

4. (a) Draw PAL coder diagram and explain. 20
(b) Explain how phase error get eliminatual in PAL System.

5. (a) Draw deltra gun picture tube and explain working. 20
(b) What is AGC ? Explain to which sections of receiver AGC is applied.

6. (a) Explain interlaced scanning with neat diagrams. 20
(b) Why negative modulation is used in TV system.

7. Write short notes on any two. 20
(i) CATV
(ii) CCIR standards for monochrome TV system.
(iii) Significance of colour Killer Circuit in colour receiver circuit.

EXTC Sem VI (Rev) / TE / 04/15

EXTC Sub:-TE

O.R. Code : 5405

(3 Hours) [Total Marks :80

N.B.: (1) Question No.1 is compulsory
(2) Answer any three questions out of remaining questions.
(3) Assume suitable data if required.

1. (a) Give CCIR-B standered.
(b) Explain electron multiplier section in brief. 20
(c) Explain what is colour killer circuit?
(d) What is the need of MUSE system?

2. (a) What is the need of Equalization pulses? Explain pre-and post-Equalization pulses in brief. 10
(b) Draw and explain the working of Vidicon in brief. 10

3. (a) Explain the features of PAL system. Explain PAL coder in details. 10
(b) Explain in details -Raster scanning. What are the advantages of this scanning system? 10

4. (a) What is the need of Chroma Sub-sampling? Explain the types in details. 10
(b) Explain the packet format for Sound / data signal in DE-MAC. 10

5. (a) Why Direct to Home is preferred over terrestrial transmission? Explain in brief DTH system. 10
(b) Explain HDTV compatibility. Give the HDTV standered for 1250 line and 1125 line. 10

6. Write short note on (any four) 20
(a) Active and passive matrix of LCD.
(b) Synchronization in MAC.
(c) Vestigial side band transmission in TV.
(d) Line rate and Aggregate data rate.
(e) Merits and Demerits of LED display.

Nov-Dec-15

TE Sem VI (EXTC) - OS - CBGS

14/12/2015

EXTC Sub:- OS

Q.P. Code : **6444**

(3 Hours) [Total Marks :80

N.B. : (1) Question **No.1** is **compulsory**
(2) Answer any **three** questions out of the remaining **five** questions.
(3) Assumptions made should be clearly stated.
(4) Figures to the right indicate **full** marks.
(5) Assume suitable data whenever required but justify the same.

1. (a) Explain Monolithic Kernel Vs Microkernel. 5
(b) How is a real time OS different from normal OS? What are the characteristics of a RTOS? 5
(c) What is PCB ? Discuss its major fields. 5
(d) Explain different services provided by Operating System. 5

2. (a) Suppose that a disk drive has 200 cylinders, numbered 0 to 199. The initial head position is at 100th track . The queue of pending requests in FIFO is 55, 58, 39, 18, 90, 160, 150, 38, 184. Calculate average seek time for each of the following algorithm. 10
1. FCFS 2. SSTF 3. SCAN 4. C-SCAN
(b) Explain Linux Policy for Page Replacement. 10

3. (a) Explain memory Management with Linked List and Bitmap. 10
(b) Consider the following set of processes having their CPU burst time (in millisecond) 10

Process	CPU Burst time	Arrival time
P1	10	0
P2	5	1
P3	2	2

for each of following algorithm
(i) Draw Gantt chart
(ii) Calculate average waiting time and Average turnaround time
(1) FCFS
(2) SJF
(3) Priority scheduling having priority range from 1 to 3 , respectively for process P1 =3, P2=2, P3=3 as given
(4) RR (slice= 2)

[TURN OVER

MD-Con. 11288-15

4. (a) Explain process state transition diagram in UNIX.
   (b) Explain the working of EDF and RMA real time scheduling algonthms.

5. (a) What is segmentation? Explain it with example.
   (b) Explain different allocation methods for files.

6. (a) Explain table driven scheduler. What are its limitations?
   (b) What is Semaphore? How can we achieve the synchronization using semaphore for producer-consumer problem ? Explain.

TE VI CBSD EXTC (NOV-DEC-15 19/12/2015
SUB: VD

EXTC Sub:- VD

QP Code : 6491

(3 Hours) **[Total Marks : 80**

N.B.: (1) **Question No. 1** is compulsory. Solve any **three** from the remaining **five** questions.
(2) Figures to right indicate full marks.
(3) Assume suitable data if required and mention the same in the answer sheet.

1. Solve **any five** from the following **20**
   a) Explain Level 1 and Level 2 MOSFET model used in circuit simulator.
   b) In 2 input CMOS NAND gate all PMOS transistors have $\left(\frac{W}{L}\right)_p = 20$ and all NMOS transistors have $\left(\frac{W}{L}\right)_n = 10$. Draw its equivalent CMOS inverter and find size of PMOS and NMOS transistor in the equivalent inverter circuit.
   c) What are advantages & disadvantages of dynamic logic circuit.
   d) Why sense amplifier is used in memory circuit. Explain its working.
   e) How low power circuit is designed through voltage scaling.
   f) Explain hot carrier effect in short channel MOSFET.

2. a) Compare resistive load inverter, saturated load inverter and CMOS inverter on the basis of Noise margins, power dissipation, area and delay. **10**
   b) Draw 2 input CMOS NOR gate and using equivalent inverter approach and derive expression for V_{in}, V_{inv}, V_{OL} and V_{OH}. **10**

3. a) Design clocked D-FF and implement using standard CMOS logic style. **10**
   b) Draw layout of six transistor CMOS SRAM using lambda rule. **10**

4. a) Explain 4-bit x 4-bit array multiplier with the help of necessary hardware for the generation and addition of partial product. **10**
   b) Why ESD protection is required for CMOS chips. Explain various techniques of ESD protection. **10**

[TURN OVER

5. a) Implement $y = \overline{A(D + E) + BC}$ using 10

i) Static CMOS style

ii) Pseudo NMOS logic style

iii) Dynamic logic style

iv) Transmission Gate logic

b) What are different types of MOSFET scaling? Explain advantages and disadvantages of each using appropriate equations. 10

6. Write short notes on **any four** 20

i) 3T-DRAM cell

ii) Clock distribution in VLSI system

iii) Barrel shifter

iv) C^{2}MOS logic style

v) 4-bit shift register

TE VI (OLD) EXTC
SUB: EL-I (RADAR)
~~SE Sem: IV~~ TE sem: VI (OLD)
13/12/2015
Nov-Dec-15

EXTC Sub:- RADAR

QP Code : **2125**

(OLD COURSE)

(3 Hours) [Total Marks :100]

N.B. : (1) Questions No. 1 is compulsory.
(2) Attempt any four out of remaining six questions.
(3) Support your Answers with neat sketches/ Diagrams
(4) Assume suitable data wherever necessary.

1. (a) Losses in Radar 5
(b) Applications of Radar 5
(c) Dupple Shift and its rule in C W Radar 5
(d) Conical scan. 5

2. (a) Derive the radar range equation as governed by a detectable signal to noise ratio. Enumerate system losses. 10
(b) What do you understand by the terms duty cycle and un-ambiguous range of a radar? Explain the technique for range ambiguity. 10

3. (a) What do you understand by the term clutter? Explain different types of radar Clutter enumerate properties of Sea and Land Clutter 10
(b) What is the drawback in simple CW. Radar. How it is overcome in CW-IF Radar? Draw and explain CW-IF Radar in detail. 10

4. (a) Draw the functions block diagram of an MTI Radar System and explain its operation. 10
Define the terms blind speed and MTI- improvement factor.
(b) Describe the chief characteristics of the radar echo from a target when its cross-section is in the 10
(i) Rayleigh region
(ii) Resonance region
(iii) In the optical region

5. (a) Explain the effect of noise in radar receiver's performance. Describe noise of figure and noise temperature. 10
(b) State the factors which influence the bandwidth of a receiver write down the advantages of large bandwidth. 10

[TURN OVER]

6. (a) Draw the block diagram of monopulse tracking radar and explain its principle of operation with suitable sketches.

(b) What are the functions of duplexer? Explain any two types of duplexers with necessary diagram.

7. Write short notes on the following (any four)

(a) PRF and range ambiguities

(b) Phased Array Antennas

(c) Angel echoes

(d) Multiple freq. CW. Radar

(e) Pulsed Radar, -block diagram and working.

TE VI (OLD) EXTC
SUB: RADAR
TE SEM-VI (OLD)
Nov. Dec-15
Sub:- RADAR
EXTC

OP Code : 2125

(OLD COURSE)

(3 Hours) [Total Marks :100]

N.B. : (1) Questions No. 1 is compulsory.
(2) Attempt any four out of remaining six questions.
(3) Support your Answers with neat sketches/ Diagrams
(4) Assume suitable data wherever necessary.

1. (a) Losses in Radar 5
(b) Applications of Radar 5
(c) Dapple Shift and its rule in C W Radar 5
(d) Conical scan. 5

2. (a) Derive the radar range equation as governed by minimum detectable signal to noise ratio. Enumerate system losses. 10
(b) What do you understand by the terms duty cycle and un-ambiguous range of a radar? Explain the technique for range ambiguity. 10

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(i) Rayleigh region
(ii) Resonance region
(iii) In the optical region

5. (a) Explain the effect of noise in radar receiver's performance. Describe noise of figure and noise temperature. 10
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[TURN OVER]

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   (a) PRF and range ambiguities
   (b) Phased Array Antennas
   (c) Angel echoes CW (CW)
   (d) Multiple freq. CW. Radar
   (e) Pulsed Radar, -block diagram and working.
