: T.E. Sem. VI (EXTC)
Microprocessor & Microcontroller-II GN-7934
17|5|2012
3pm to 6pm

Note: Question no. 1 is compulsory.

All questions carry equal marks.

Q.1 A Design 8086 microprocessor based system with following specification   10

a) Microprocessor 8086 working at 10 MHz

b) 32 KB EPROM using 8 KB chips

c) 16 KB SRAM using 4 KB chips

Explain the design.

B Differentiate 8086, 80286 and 80386 on the basis of address bus size, data bus size, number
of segment registers and maximum size of every segment.   4

C Explain data memory organisation of PIC 18.   6

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

B Draw timing diagram for write operation in maximum mode of 8086 and explain it.   10

Q.3 A Explain different data types supported by 8087 NDP with example.   10

B Interface DMA controller 8257 with 8086 microprocessor. Explain different data transfer
modes of 8257 DMA controller.   10

Q.4 A Write assembly language program for 8086 to exchange contents of two memory blocks.

10

B i) Explain status register of PIC 18.   5

ii) Explain pipeline concept used in 8086 microprocessor.   5

Q.5 A Which are the different types of interrupt supported by 8086? Explain how 8086 provides
service to any interrupt?   10

B Write functions of following instructions of PIC 18.   10

i) movlw 0x25   ii) cpfseq 0x25, A   iii) bnc n   iv) tblrd*+   v) btg 0x25, 7, a

Q.6 A Explain different string primitives of 8086 microprocessor.   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   20

i) Data related addressing modes of 8086   ii) Assembler directives

iii) Clock generator 8284   iv) I/O Port structure of PIC 18

2215 T.E (EXTC) Sem VI (R)

VT-F.H.Exam. April.-12-134
Con. 3774-12.

Antenna & Wave Propagation

GN-7272

(3 Hours)   [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
         (2) Solve any **four** questions from **remaining** questions.
         (3) Assume **suitable** data if **required**.

1. (a) Describe the concept of near field and far field radiation.   5
    (b) Explain the principle of pattern multiplication with suitable example.   5
    (c) Explain Radiation pattern of short dipole.   5
    (d) Differentiate between broadside and end fire array.   5

2. (a) Describe parabolic reflector and its use of microwave frequencies. Discuss 10
        Cassegrain method of feeding the parabolic reflectors.
    (b) Derive the expression for vector potential wave equation.   10

3. (a) Show that the radiation resistance of a wire dipole is given by   12

    $$R_{rad} = 80 \pi^2 \left(\frac{dL}{\lambda}\right)^2,$$ where dL is the small length of wire dipole. Also if

    operating frequency of a half wave is 400 MHz, find its effective area.
    (b) Explain in brief the working of helical antenna with one application.   8

4. (a) What is line of sight propagation ? Obtain the expression for range of line of 10
        sight for spacewave propagation in terms of antenna's transmitting and receiving
        heights.
    (b) Explain the structure of microstrip antenna. Discuss its feed mechanisms and   10
        application.

5. (a) Explain ducting effect. Under what conditions this effect takes place ?   10
    (b) State and give the application of Reciprocity theorem. Show that the transmitting 10
        and receiving radiation patterns of antennas are equal.

6. (a) State and derive FRISS transmission equation.   10
    (b) A uniform linear array is required to produce an end fire beam when it is operated 10
        at 12 GHz. It contains 50 radiations and are spaced 0·5 λ. Find the progressive
        phase shift to produce the end fire beam. Also find the array length.

7. Write short note on :—   20
    (a) Ionospheric propagation.
    (b) Ground Interference effects
    (c) Maxwell's equations for harmonic variations
    (d) Log periodic antenna.

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24 : 1st half.12-SHILPA(b)

Con. 4048-12.

(3 Hours) [Total Marks : 100

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

1. (a) Explain Shanon Hartley Theorem. 5
(b) Discuss the significance of Eye pattern. 5
(c) Explain Viterbi Algorithm. 5
(d) Compare ISI and ICI. 5

2. (a) State and prove the Sampling theorm for low pass singal. 10
(b) Derive an expression for Entropy. 10
A Gaussian channel has 2 MHz bandwidth. Calculate the channel capacity if the signal power to noise spectral density ratio is 10^5 Hz. Also find the maximum information rate.

3. (a) Why line codes are required in digital communication ? Draw the following line 10
code formats for the given data pattern. **0 1 1 0 1 0 0 1**.
(i) Polar Rz
(ii) RZ-AMI
(iii) Unipolar NRZ
(iv) Differential Manchester.
(b) Draw the block diagram of QASK transmitter and receiver and explain it's functioning. 10

4. (a) Compare the following :- 10
(i) BPSK and DPSK
(ii) Systematic and Non-systematic codes.
(b) Derive an expression for the probability of error of a matched filter. 10

5. (a) Explain syndrome decoding for cyclic codes. 10
(b) Draw the encoder for a (7,4) cyclic Hamming code generated by the generator 10
polynomial. $G(D) = 1 + D + D^3$.

6. (a) Draw the block diagram of M ary FSK Transmitter and receiver and explain the working. 10
(b) An error control code has the following parity check matrix. 10

$$= \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

(i) Determine the generator matrix G
(ii) Find the code words that begin with 101 ----
(iii) Decode the received code word 110110. Comment on error detection capability
of this code.

Write short notes on :–   **20**

(a) Equalization
(b) Bit Synchronizer
(c) CRC Codes.

Con. 4539–12.

GN–8639

(3 Hours)

[Total Marks : 100

N.B. :

    (1) Question No. 1 is compulsory.

    (2) Attempt any four questions from the remaining six questions.

    (3) Figure to right indicate full marks.

    (4) Assume suitable data if necessary.

Q.1 a)	What is chromacity diagram? Explain it.	[5]
b)	Explain additive and subtractive colour mixing.	[5]
c)	What is colour burst? What is the importance of back porch in CVS?	[5]
d)	List types of AGC & only describe the basic principle operation of AGC used in TV receiver.	[5]

Q.2a)   Explain interlaced scanning in details with the help of neat diagram and explain how it is better than   [10] sequential scanning. List advantages of it.

     b)   Draw cross sectional view of an image orthicon tube & explain how it develops video Signal when   [10] light focused on its face plate. List advantages of it.

Q.3a)   Draw the composite video signal for three horizontal lines and explain the various components in   [10] details.

     b)   Draw the neat block diagram of an NTSC coder and decoder and explain the functioning.   [10]

Q.4 a)   Compare Delta gun, PIL and Trinitron colour picture tubes.   [10]

     b)   Give reasons :––   [10]
             i) Why (G-Y) signal is not selected for transmission?
             ii) All TV standards have odd number of lines.

Q.5 a)   Draw and explain block diagram of TV Transmitter system.   [10]

     b)   Draw and explain a neat schematic of cable TV network.   [10]

Q.6a)   What is EIA test pattern? Draw & explain EIA pattern with its utility.   [10]

     b)   Draw the neat block diagram of PAL coder & decoder & explain functioning of it.   [10]

Q.7)   Write short note on :––   [20]

        a) Frequency interleaving.
        b) CCTV.
        c) RTSP.
        d) Multicasting.

T.E (EXTC) VI Rev

May 2012

S/6/12

Industrial Eco
&
Telecom Regulation

71 : 1st half-12-(j)JP

Con. 4730-12.

GN–9230

(2 Hours)   [Total Marks : 50

N.B. (1) Question No. **1** is **compulsory**.
    (2) Attempt any **four** questions from remaining **six** questions.
    (3) **All** questions carry **equal** marks.

1. Answer the following :— (any **two**)   10
    (a) Explain the nature of supply and demand in free market.
    (b) What are the consequences of black money ? How are consequences
        controlled by the government ?
    (c) What is the responsibility of Telecom Authorities towards the public ?

2. (a) Explain different types of competitions existing in the present economy.   5
   (b) What is a multiple credit creation ? Who are the beneficiaries of this creation ?   5

3. (a) Explain in brief the role of Reserve Bank of India.   5
   (b) Describe the Taxation method adopted by Government of India.   5

4. (a) Explain any **two** of the following :—   5
            (i) Balance of Payment
            (ii) Tariffs
            (iii) Subsidies.
   (b) How does the government protect international trade ?   5

5. (a) How the basic concepts of management are applicable to all kinds of businesses ?   5
   (b) Describe the interconnection of Leadership and Motivation.   5

6. (a) What is ITU ? What role has it played in global communication ?   5
   (b) Describe the following (any **one**) :—   5
            (i) Broadband Policy
            (ii) Cable Network Act.

7. Write explanatory notes on (any **two**) :—   10
            (a) Marketing mix
            (b) Effective communication in enterprises
            (c) Enforcement of Telecom regulations.

(3 Hours)   [Total Marks : 100

N.B. (1) Question No. **1** is **compulsory** and answer any **four** questions out of remaining **six** questions.

(2) Assume **suitable** data wherever **necessary**.

1. (a) Derive radar range equation in terms of signal to noise ratio. Explain its **10** significance.

   (b) A radar mounted on an automobile is to be used to determine to a distance to a **10** vehicle travelling directly in front of it.

   The radar operates at a frequency of 9375 MHz with a pulse width of 10ns $(10^{-8}s)$. The max range is 500 ft.

   Find :—
   - (i) PRF for max range of 500 ft.
   - (ii) If the antenna dimensions were 1ft by 1ft and antenna efficiency were 0·6. What would be antenna gain in dB ?
   - (iii) Find the average power required to detect a 10 m^2 radar cross section vehicle at a range 500 ft, if the minimum detectable signal is 5×10^{-13} W.

2. (a) Draw and explain CW-IF Radar with filter bank.   **10**

   (b) Explain integration of radar pulses with integration improvement factor. How does **10** it affect the radar equation ?

3. (a) What do you meant by radar cross section ? Explain RCS of :—   **10**
   - (i) Sphere   (ii) Rod   (iii) Cone.

   (b) Explain in brief system losses in Radar.   **10**

4. (a) What do you meant by radar clutter ? Derive equation of surface clutter and explain **10** different factors affecting it.

   (b) (i) With CW transmit frequency 5 GHz. Calculate the doppler frequency seen **10** by a stationary radar when target radial velocity is 100 km/n.

   (ii) Explain staggered pulse repetition frequency.

5. (a) Draw and explain MTI radar with block diagram. What are its limitations ?   **10**

   (b) Explain Branch type and Balanced type Dupleners in Radar.   **10**

6. (a) With the help of block diagram explain conical scanning used in Radar.   **10**

   (b) Draw the block diagram of amplitude comparison monopulse tracking Radar and **10** explain its principle of operation with suitable sketches.

7. Write short notes on any **four** of the following :—   **20**
   - (a) Matched filter receiver for Radar
   - (b) Delay line cancellor
   - (c) MFCW Radar
   - (d) Phased array Radar
   - (e) Different types of displays used in Radar.

EXTC

Sem-VI(R) — Neural network
& fuzzy logic
9/May-2012

P4-Exam.-May-12-58

Con. 4853-12.

GN-9732

(3 Hours)   [Total Marks : 100]

N.B. : (1) Question No. **1** is **compulsory**.
       (2) Attempt **any four** questions **out** of the remaining **six** questions.
       (3) Assume **suitable** data if **required**.

1. Answer any **four** questions in brief :—   20
   (a) Explain the three natural genetic operators with examples.
   (b) If A is a fuzzy set defined by

   $$A = \left\{ \frac{0 \cdot 5}{x_1} + \frac{0 \cdot 4}{x_2} + \frac{0 \cdot 7}{x_3} + \frac{0 \cdot 8}{x_4} + \frac{1}{x_5} \right\}.$$

   List all the cuts and strong α – cuts of A.
   (c) State the applications of Kohonen self-organizing maps.
   (d) How many hidden layers are necessary to approximate a continuous function ?
   (e) Explain the operations of Dendrite, Soma and axon in the biological neuron.
   (f) What are the parameters to be considered for the design of membership function ?

2. (a) Three fuzzy sets are given as follows :—   10

   $$P = \left\{ \frac{0 \cdot 1}{2} + \frac{0 \cdot 3}{4} + \frac{0 \cdot 7}{6} + \frac{0 \cdot 4}{8} + \frac{0 \cdot 2}{10} \right\}$$

   $$Q = \left\{ \frac{0 \cdot 1}{0 \cdot 1} + \frac{0 \cdot 3}{0 \cdot 2} + \frac{0 \cdot 3}{0 \cdot 3} + \frac{0 \cdot 4}{0 \cdot 4} + \frac{0 \cdot 5}{0 \cdot 5} + \frac{0 \cdot 2}{0 \cdot 6} \right\}$$

   $$T = \left\{ \frac{0 \cdot 1}{0} + \frac{0 \cdot 7}{0 \cdot 5} + \frac{0 \cdot 3}{1} \right\}$$

   Perform the following operations over the fuzzy sets :
       (i)   Two Cross Products
       (ii) Max–min Composition
       (iii) Max Product.
   (b) Write the properties of fuzzy set theory and explain.   10

   (a) Explain in detail the discrete hopfield network.   10
   (b) Write an algorithm for back propagation training and explain about the updation 10
       of weight.

   (a) Explain the operation of the fuzzy logic control with Process Inference block. 10
   (b) Compare supervised learning with unsupervised learning. Give suitable examples 10
       to explain.

[TURN OVER

5. (a) Using the delta rule, find the weights required to perform the following **10**
classifications : vectors (1, 1, −1,−1) and (−1,−1,−1,−1) are belonging to the
class having a target value 1 ; vectors (1,1,1,1) and (−1,−1,1,−1) are belonging
to the class having target value −1. Use a learning network of 0·5 and assume
random values of weights. Also test the response of the network using each
of the training vectors as input.

   (b) Write notes on :– **10**
      (i) Brain–in–a–box model
      (ii) ANFIS.

6. (a) What is clustering and what are the different methods of clustering ? Discuss **10**
winner takes all learning network.

   (b) Explain and draw McCulloch – Pitts neuron architecture. **10**

7. (a) Give any one application of pattern recognition in detail. **10**

   (b) Write in short about :– **10**
      (i) Adaptive fuzzy system
      (ii) Knowledge base
      (iii) Defuzzification.