B.E (VII) Rev Etrx

Communication Network

Con. 4502-12. **(REVISED COURSE)** **GN–8489**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. 1 is Compulsory.

(2) Attempt any four questions out of remaining six questions.

(3) Assume suitable data, wherever necessary.

Q.NO.1 (a) Explain How Fast Ethernet differs from 10 base T? (05)

(b) Compare In Band signaling and Out Band signaling. (05)

(c) Write a note on flow control in data link layer. (05)

(d) Explain the TCP/IP utilities. (05)

Q.NO.2 (A) Explain the various transmission media and transmission line impairments in details. (10)

(B) Derive the transmission efficiency of GO back N ARQ. State effect of bit error rate and delay bandwidth product on transmission efficiency. (10)

Q.NO.3 (A) Explain SONET/SDH in detail. (10)

(B)Compare packet switching and circuit switching in detail. (10)

Q.NO.4 (A) Explain Dijkstra's algorithm and Bellman Ford Algorithm in detail. (10)

(B)Explain ADSL with respect to channel configuration and modulation techniques. (10)

Q.NO.5 (A) Explain STOP AND WAIT arq, Go-Back N- ARQ, Selective Repeat ARQ. (10)

(B) Explain in detail Repeater, HUB, Bridges, Routers, Gateway, Switches. (10)

Q.NO.6 (A) Explain in detail HDLC protocol with all frame types supported by HDLC. (10)

(B)Explain Berkeley Application Programming Interface in Detail. (10)

Q. NO.7 Write short notes on Following :–

(A) TELNET and FTP (05)

(B)OSI layered architecture (05)

(C)IEEE 802.3 standards (05)

(D)IPv4 and IPv5 (05)

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BE / ETRX / VII (R) 1615/12
FD

Con. 3988–12. (REVISED COURSE) GN–6275
(3 Hours) [Total Marks : 100

N.B. : 1) Question no 1 is compulsory.
2) Attempt any four questions from remaining six questions.
3) Figures to right indicate full marks
4) Assume suitable data, if any.

Q1) Attempt the following (20)
a) Discuss the design procedure for eliiptic filter design.
b) Explain quadrature mirror filtering in multirate DSP
c) Briefly explain the leapfrog realization techniques.
d) Explain the MMSE criterion.

Q2) a) Prove that $\Omega_c = \frac{\Omega_p}{(10^{0.1\alpha_p}-1)^{1/2N}} = \frac{\Omega_s}{(10^{0.1\alpha_s}-1)^{1/2N}}$ (10)

b) To design a digital band pass filter, which type of Linear Phase FIR filter can be used? Why?? (05)

c) State the concept of adaptive filter. (05)

Q3) a) Design a Chebyshev filter with a maximum pass band attenuation of 2.5dB at $\Omega_p = 20$ radian / second and the stop band attenuation of 30 dB at $\Omega_s = 50$ radian / second. (10)

b) Explain Gibbs phenomenon and state the reason of occurrence and state how it can be reduced (10)

Q4) a) Design a Butterworth filter satisfying the following constraints: (10)

$$0.75 \le \left|H(e^{j\omega})\right| \le 1 \quad \text{for } 0 \le \omega \le \frac{\pi}{2}$$

$$\left|H(e^{j\omega})\right| \le 2 \quad \text{for } \frac{3\pi}{4} \le \omega \le \pi ,$$

With T = 1 sec, using impluse invariance.

b) State the advantages of switched capacitor filters (05)

c) State working principle and applications of Weiner filter. (05)

Q5) a) Design filter with, (10)

$$H_d = e^{-j3\omega} \quad \text{for} \quad -\frac{\pi}{4} \le \omega \le \frac{\pi}{4}$$

$$= 0 \quad \text{for} \quad \frac{\pi}{4} \le |\omega| \le \pi ,$$ using Hamming window with N=7.

b) Discuss the effect of decimation and interpolation in time and frequency domain with suitable example. (10)

Q6) a) Apply bilinear transformation to $H(s) = \frac{2}{(s+1)(s+2)}$ with T= 1 sec and find H(z). (10)

b) Explain low pass to band stop frequency transformation (05)

c) Briefly describe FDNR and state its properties. (05)

Q7) Write short note on following: (20)
a) Primary resonator block
b) RLS algorithm
c) Sub band coding
d) Pre warping

BE| ETRX| VII (REV.) 21|5|2012
Power Electronic & Drives

VT-F II Exam April-12-132

Con. 3718-12. **(REVISED COURSE)** GN–6290

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** additional data if **necessary**.

1. Attempt the following :– **20**
   (a) Explain regenerative braking for D.C. motors.
   (b) List the merits and demerits of on-line and off-line UPS.
   (c) Explain how to quadrant type B chopper operates in first and fourth quadrants.
   (d) Compare voltage source and current source inverters.

2. (a) Draw and explain the operation of single phase semiconverter fed D.C. separately excited motor with relevant waveforms and expressions. **10**
   (b) Explain with neat diagram the operation of rotor resistance control using chopper. **10**

3. (a) Explain with neat diagram the working of parallel inverter. Explain the need of feedback diodes. Draw capacitor, SCR and load voltage waveforms. **10**
   (b) Describe the principle of step-up chopper. Derive an expression for the average output voltage. State the assumptions made. **10**

4. (a) Explain with relevant circuit diagram the static Scherbius drives for obtaining speeds below as well as above synchronous speeds. **10**
   (b) Explain in detail the operation of dual converter with circulating current. List the advantages and disadvantages of the same. **10**

5. (a) A 220 V, 1500 rpm, 10 A separately excited d.c. motor has an armature resistance of 1 Ω. If is fed from a single phase fully controlled bridge rectifier with an a.c. source voltage of 230 V, 50 Hz. Assuming continous load current, compute :– **10**
      (i) Motor speed at firing angle of 30° and torque of 5 Nm.
      (ii) Developed torque at the firing angle of 45° and speed of 1000 rpm.
   (b) Describe single phase McMurray-Bedford full bridge converter with neat diagram and related voltage and current waveforms. **10**

6. (a) Draw and explain the operation of flyback converter with relevant waveforms. **10**
   (b) Explain the operation of load commutated chopper with neat circuit diagram and associated current and voltage waveforms. **10**

7. Write short notes on the following :– **20**
   (a) V/f control for induction motor
   (b) Effect of source inductance on performance of converter.
   (c) Harmonic reduction in inverters.

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BE (ETRX) VII (Rev) 25/5/12
VLSI Design

Con. 3927-12. **(REVISED COURSE)** **GN–6272**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** out of **remaining six** questions.
(3) Draw **neat** diagrams wherever **required**.

1. (a) Compare semi-custom and full-custom design. **5**
(b) Compare Burried and Butting contacts. **5**
(c) Compare ion implantation and Diffusion. **5**
(d) Draw stick diagram for CMOS inverter. **5**

2. (a) Explain the Twin Tub process in detail **10**
(b) Explain latchup in CMOS and how to prevent it. **10**

3. (a) Calculate the threshold voltage V_{TO} at V_{SB} = 0·5V for a polysilicon gate n-channel MOS transistor, with the following parameters. **10**
Substrate doping, $N_A = 10^{16}/cm^3$
Polysilicon gate doping $N_D = 2 \times 10^{20}/cm^3$
Gate oxide thickness $T_{ox} = 500A^o$
Oxide interface fixed charge density $N_{ox} = 4 \times 10^{10}/cm^2$
(b) Explain short channel effect in MOSFET. **10**

4. (a) Draw the stick diagram and mask layout using λ based design rules for a depletion load nMOS inverter with a pullup to pulldown ratio as 4 : 1. **10**
(b) Explain various sources of power dissipation in digital CMOS circuits. **10**

5. (a) Explain constant voltage and constant field scaling in detail with their merits and demerits. **10**
(b) Write Verilog code for 1 Bit full adder and use it to design a 4 Bit full adder. **10**

6. (a) Implement the following Boolean function in CMOS logic. **10**

$$Y = \frac{\text{CMOS logic}}{C(D+E) + A \cdot B.}$$

Draw the stick diagram for the circuit.
(b) What is the need for Design Rules ? Justify. **10**

7 Write notes on (any **two**) :— **20**
(a) Wafer processing
(b) MOS capacitor
(c) VLSI design flow.

4/6/2012 Sem-VII (E) - ETRX - Digital Image Processing Design,

AGJ 1st half (i) 1

Con. 4652-12. **(REVISED COURSE)** **GN–8912**

(3 Hours) **[Total Marks : 100**

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

1. Answer the following questions .– **20**
   (a) Explain digital image sampling and quantization.
   (b) Differentiate between point processing and mask processing.
   (c) Describe the operators for detecting the diagonal edges in an image.
   (d) Define Hadamard transform. Write the Hadamard matrix for N = 8.

2. (a) For the pixels p and q as shown in figures with coordinates (1, 1) and (4, 4) find :– **10**
   (i) Euclidean distance
   (ii) City block distance
   (iii) Chess board distance.

p	(2)	4	5	3	4
	5	3	2	4	5
	7	6	2	1	5
	6	5	3	4	0
	4	5	7	(2)	6

q

V = { 2, 3, 4 }

   (b) Explain various image enhancement techniques in spatial domain. **10**

3. (a) Explain various image enhancement techniques in frequency domain. **10**
   (b) Explain region splitting and merging technique for image segmentation with suitable examples. **10**

4. (a) Discuss various representation schemes of digital image processing. **10**
   (b) Explain the following morphological operations with the help of examples – **10**
   (i) Erosion
   (ii) Dilation
   (iii) Opening
   (iv) Closing.

5. (a) Define Haar transform. Compute the Haar basis for N = 2. **10**
   (b) Explain the properties of two dimensional discrete fourier transform in detail. **10**

6. (a) Obtain the Huffman code for the word 'COMMITTEE' and calculate entropy, average code word length and coding efficiency. **10**
   (b) Explain image compression model with the help of neat block diagram. **10**

7. Write short notes on the following :– **20**
   (a) Text Compression
   (b) Biometric Authentication
   (c) Lossy Compression
   (d) Applications of digital watermarking.

BE/ ETRX/ VII (Rev.) 4/6/2012
Wireless Communication

Con. 4677-12. **(REVISED COURSE)** **GN–9029**

(3 Hours) **[Total Marks : 100**

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

1. (a) Explain the difference between Soft Hand-off and Hard-hand off. 20
(b) Which are the different database registers maintained in GSM system ? Bring out the functions of each of them.
(c) Explain spectral efficiency and pulse-shaping in OFDM.
(d) What is Near-far problem ? How is this problem solved in a fading environment ?
(e) Bring out the importance of GOS (Grade Of Service).

2. (a) Which are the different techniques of improving the capacity of a cellular system ? Expain in detail. 12
(b) A 25 MHz total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 kHz RF bandwidth. Find :— 8
(i) the no. of duplex channels available.
(ii) the total no. of channels per cell site, if N = 4 and N = 7 cell reuse is used.

3. (a) Explain with a neat block diagram, the architecture of GSM system, with all interfaces. 10
(b) Explain the need of spreading the sequence in CDMA. Expain DS-SS Transmitter and Receiver with neat block diagram. 10

4. (a) Explain OFDM block diagram and derive the expression for OFDM signal. What is the significance of 'cyclic prefix' in OFDM ? 10
(b) Explain the TDMA frame structure in GSM. What is the importance of 'timing advance' in it ? 10

5. (a) Explain CDMA-2000 layered architecture. Also explain MAC and LAC sublayers. 10
(b) Sketch the uplink and downlink CDMA (IS-95) models and explain. 10

6. (a) Explain the architecture of GPRS system. Bring out the functionalities of SGSN and GGSN nodes. 10
(b) Why is Power Control so important in CDMA systems ? Discuss the two methods of Power Control mechanisms in IS-95 system. 10

7. Write short notes on :— 20
(a) RAKE Receiver
(b) Umbrella cell approach in Cellular system
(c) Logical channels of GSM
(d) Bluetooth.