BE | EXTC | VII (R) 27/5/13
Computer Communication Network

AGJ 1st half (n)con-code 746

Con. 9370-13. **(REVISED COURSE)** **GS–5788**

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

N.B. :(1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Illustrate answers with **sketches** wherever **required**.
(4) **Figures** to the **right** indicate marks.

Q. No. 1) [20]

a) Explain the difference between a connection oriented and connectionless service.
b) What is data transparency? Explain bit stuffing and destuffing.
c) What is collision and broadcast domain? How can they be reduced?.
d) Explain ALOHA and Slotted ALOHA.

Q. No. 2)

a) What does the term error control mean in data link layer? Explain Go back N and selective repeat ARQ protocols. [10]
b) Explain count to infinity problem with an example and a mèthod to avoid this Problem. [10]

Q. No. 3)

a) Compare circuit switching, packet switching and message switching in detail. [10]
b) Explain TCP header in detail. [10]

Q. No. 4)

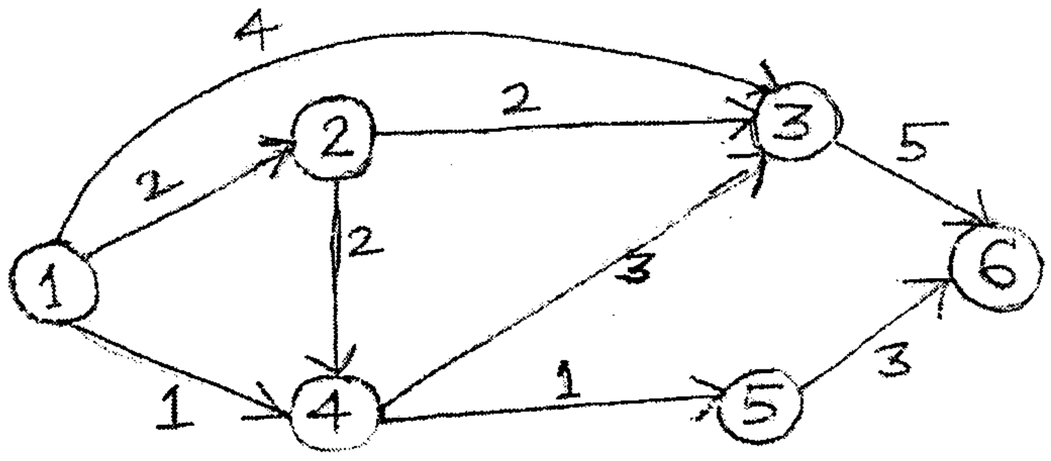
a) Explain in detail repeaters, hub, bridges, routers, gateway and switches. [10]
b) What is exterior and interior routing? Explain in brief distance vector routing and Link state routing. [10]

Q. No. 5)

a) Explain HDLC frame format. Describe configuration and response modes supported by HDLC protocol. [10]
b) Explain looping problem in bridge LAN with appropriate example. How to solve it. [10]

Q. No. 6)

a) Write a note on IEEE 802.3 standard in detail. [10]
b) Find the shortest path between the source node **1** to all other nodes for the network given below using Dijkstra's algorithm. Also draw the shortest path tree from node **1** to all other nodes. [10]



Q. No. 7) Write short notes (Any two): [20]

i) M/M/I model
ii) ARP and RARP
iii) ICMP

9/5/2013

B.E (EXTC) Sem VII (R)
Discrete Time Signal Processing

ws-Con-2013-1

Con. 7541–13. **(REVISED COURSE)** **GS–5332**

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

N. B.

1. *Question no. 1 is compulsory.*
2. *Answer any four out of the remaining six questions.*
3. *Assumption made should be clearly stated.*
4. *Assume any suitable data wherever required but justify the same.*
5. *Figures to the right indicate marks.*
6. *Illustrate the answers with sketches wherever required.*
7. *Answer to the questions should be grouped and written together*
8. *Use Blue/Black ball ink pen to write answers. Use of pencil should be done only to draw sketches and graphs*

Q.1 (a) Assume that a complex multiplier takes 1 micro sec to perform one multiplication and that the amount of time to compute a DFT is determined by the amount of time to perform all the multiplications. [5]

i. How much time does it take to compute a 1024 point DFT directly?

ii. How much time is required is FFT is used?

(b) Let h[n] be the unit impulse response of a Low Pass filter with a cutoff frequency ω_c, what type of filter has a unit sample response $g[n] = (-1)^n h[n]$. [5]

(c) A two pole low pass filter has the system function $H(z) = \frac{b_0}{(1-pz^{-1})^2}$ Determine the values of b_0 and p such that the frequency response $H(\omega)$ satisfies the condition $|H(0)| = 1$ and $\left|H\left(\frac{\pi}{4}\right)^2\right| = \frac{1}{2}$ [5]

(d) Consider filter with transfer function. Identify the type of filter and justify it. [5]

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

Q.2.(a) The unit sample response of a system is h(n)={3,2,1} use overlap-add method of linear filtering to determine output sequence for the repeating input sequence x[n] = {2,0,-2,0,2,1,0,-2,-1,0} **10**

(b) For a given sequence x(n) ={2,0,0,1}, perform following operations: **10**

i. Find out the 4 point DFT of x(n)

ii. Plot x(n), its periodic extension $x_p(n)$ and $x_p(n-3)$

iii. Find out 4 point DFT of $x_p(n-3)$

iv. Add phase angle in (i) with factor - $\left[\frac{2\pi rk}{N}\right]$ where N=4, r=3 k=0,1,2,3

v. Comment on the result you had in point (i) and (ii)

Q.3.(a) The transfer function of discrete time causal system is given below : **10**

$$H(z) = \frac{1 - z^{-1}}{1 - 0.2z^{-1} - 0.15z^{-2}}$$

i. Find the difference equation

ii. Draw cascade and parallel realization

iii. Show pole-zero diagram and then find magnitude at $\omega = 0$ and $\omega = \pi$

iv. Calculate the impulse response of the system.

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(b) Obtain the lattice realization for the system : **10**

$$H(z) = \frac{1 + 3z^{-1} + 3z^{-2} + z^{-3}}{1 + \frac{3}{4}z^{-1} + \frac{1}{2}z^{-2} + \frac{1}{4}z^{-3}}$$

Q.4.(a) What is a linear phase filter? What conditions are to be satisfied by the impulse response of an FIR system in order to have a linear phase? Plot and justify compulsory zero locations for symmetric even antisymmetric even and antisymmetric odd FIR filters **10**

(b) Determine the zeros of be following FIR systems and indicate whether the system is minimum phase, maximum phase, or mixed phase **10**

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

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

$H_1(z) = 1 - \frac{5}{2}z^{-1} - \frac{3}{2}z^{-2}$

$H_1(z) = 1 + \frac{5}{3}z^{-1} - \frac{2}{3}z^{-2}$

Comment on the stability of the minimum and maximum phase system

Q.5 (a) A digital low pass filter is required to meet the following specifications : **10**

Pass band ripple	:	≤ 1dB
Pass band edge	:	4 KHz
Stop band attenuation	:	≥ 40 dB
Stop band edge	:	8 KHz
Sampling rate	:	24 KHz

Find order, cutoff frequency and pole locations for Butterworth filter using bilinear transformation

(b) Design an FIR digital filter to approximate an ideal low-pass filter with passband gain of unity, cut-off frequency of 950 Hz and working at a sampling ftequency of Fs = 5000 Hz. The length of the impulse response should be 5. Use a rectangular windo;v. **10**

Q.6(a) Explain the need of a low pass filter with a decimator and mathematically prove that $\omega_y = \omega_x D$ **10**

(b) Why is the direct form FIR structure for a multirate system inefficient? Explain with neat diagrsms how this inefficiency is overdone in implementing a decimator and an interpolator. **10**

Q.7 Write short notes (any four); **20**

i. DTMF detection using Goertzel algorithm

ii. Filter banks

iii. Comparison of FIR and IIR filters

iv. Split radix FFT

v. Optimum Equiripple Linear phase FIR filter design

BE (EXTC) SEM VII (Rev) May 2013
mobile comm. Sys. 14/5/13

1st Half-13-Mina - (c)-60

Con. 7735-13. **GS-5449**

(REVISED COURSE)

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

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

1. (a) Explain the various nonlinear effects in FDMA. **5**
(b) Explain fast associated and slow associated control channels in GSM. **5**
(c) What is umbrella cell approach ? **5**
(d) Explain variable data rate transmission in CDMA. **5**

2. (a) Discuss IMT 2000 system. **10**
(b) With neat diagram, explain reverse CDMA channel. **10**

3. (a) Draw and explain GPRS architecture. **10**
(b) Explain with neat diagram mobility management in CDPD. **10**

4. (a) Explain signal processing in GSM. What is the use of interleaver ? **10**
(b) Explain handoff and power control in 3G system. **10**

5. (a) Discuss forward W-CDMA channel. **10**
(b) Compare SDMA, TDMA, FDMA and CDMA. **10**

6. (a) Derive relationship between S/I (signal to interference ratio) and cluster size N. **10**
(b) For the two-ray ground reflection model, derive the expression for received power at a distance 'd' from the transmitter. **10**

7. Write short notes on (any **two**) :— **20**
(a) Sectoring in GSM
(b) Knife edge diffraction model
(c) Effect of Doppler spread on fast fading and slow fading.

B.E (EXTC) SEM VII (R) 21/05/13
Fundamental of Microwave Engineering.

AGJ 1st half (e+) 4

Con. 8891-13. **(REVISED COURSE)** **GS–5560**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) Use Smith chart wherever **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Differentiate between waveguide and transmission line. **5**
   (b) Explain amplification process in TWT. **5**
   (c) Compare klystron with magnetron. **5**
   (d) State and explain Lorentz Reciprocity theorem. **5**

2. (a) Describe the mechanism of velocity modulation in a two cavity klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output. **10**
   (b) Describe operation of O-type and M-type device in brief. Explain in brief Gyrotrons. **10**

3. (a) Explain the working of Magic Tee. Design a circulator using Magic Tees. **10**
   (b) Explain the procedure of measurement of dielectric constant at microwave frequency. **10**

4. (a) Describe construction and working of two hole directional coupler along with its S-matrix. **10**
   (b) Explain the working of a negative resistance parametric amplifier. **10**

5. (a) Explain single stub matching. What are its advantages and disadvantages ? **10**
   (b) Calculate the position and length of short circuited stub design to match 200+j300 load to a transmission line whose characteristics impedance is 300 Ω (use Smith chart). **10**

6. (a) Describe different modes of oscillation of Gunn diode. **10**
   (b) Explain the working of (i) Coupled line filters (ii) Filters using coupled resonators. **10**

7. Write short notes on the following :–
   (a) Measurement of impedance **5**
   (b) Hybrid junctions **5**
   (c) Show that TM_{01} and TM_{10} modes in a rectangular do not exist **5**
   (d) Microwave propagation in ferrites. **5**
