B.E / EXTC / Sem VII (Rev) NOV/DEC'16

MOBILE Comm. System

QP CODE: 628801

MARKS: 100

(OLD COURSE)

(3 Hours)

NB: 1. Question no. 1 is compulsory.

2. Attempt any four out of remaining six.

3. Assume suitable data if required.

Q.1 Attempt any four (20)

(a) Explain different types of handoff in 2G.
(b) Derive relationship between capacity C of a system and cluster size N.
(c) Explain Umbrella cell approach.
(d) Compare 1G to 3G cellular system.
(e) Explain channel assignment strategy in mobile cellular system.

Q.2(a) Explain how does 60^0 and 120^0 sectoring improves signal to interference ratio and therefore system capacity. (10)

(b) Draw and explain block diagram of GSM speech encoder, and explain frequency hopping in GSM. (10)

Q.3(a) Explain radio interface and Channel specifications of IS-95 CDMA system. (10)

(b) Explain knife edge diffraction model. (10)

Q.4(a) Describe open loop and closed loop power control in IS-95 CDMA. (10)

(b) Explain security algorithm in GSM. (10)

Q.5(a) If there are 50 channels in a cell to handle all the calls and the average call holding time is 100s per call. How many calls can be handled with GOS=2% and offered traffic load is 40 erlang. Define Erlang B system. (10)

(b) Explain with neat diagram mobility management in CDPD. (10)

Q.6(a) With neat diagram explain reverse link traffic channel in IS-95 CDMA system. (10)

(b) Discuss services and features of IMT 2000 system. (10)

Q.7(a) Explain GSM frame structure. (10)

(b) Explain RAKE receiver. (10)

EXTC /Old/ Sem VII / Nov-Dec 2016/ Fundamentals of Microwave Engineering

Q.P. Code : 628901

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

Note : 1) Question **No. 1** is **compulsory.**
2) Solve **any four** questions from the remaining.
3) Assume suitable data wherever necessary and justify the assumption.
4) **Draw** suitable **diagrams** wherever required.

1. (a) Justify why waveguide does not support TEM propagation. **5**
   (b) Differentiate between transit time devices and transferred Electron devices. **5**
   (c) List out characteristics and hazards of Microwave. **5**
   (d) Explain microwave propagation in Ferrites **5**

2. (a) How matched impedance is achieved in transmission line? Explain any one method in detail. **10**
   (b) The dimensions of rectangular waveguide are 2.5 cm and 1 cm. The frequency of operation is 8.6 GHz. **10**
   Find (i) All possible modes (ii) Cutoff frequency and guide wavelength.

3. (a) Explain the working and derive S matrix for a two-hole directional coupler. **10**
   (b) Describe the mechanism of velocity modulation in two cavity klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output. **10**

4. (a) Design a low pass composite filter with cutoff frequency 2MHz and impedance of 50 ohms. Place infinite attenuation pole at 2.08 MHz. **10**
   (b) Explain working and amplification process in TWT. **10**

5. (a) Explain the procedure of measurement of dielectric constant at microwave frequency. **10**
   (b) Explain the construction and working of microwave FET in detail. **10**

6. (a) Explain different modes of oscillation of Gunn diode. **10**
   (b) How is bunching activated in cavity magnetron. Explain phase focusing effect. **10**

7. Write short notes on the following :- **20**
   a. Impatt diode
   b. Periodic structure
   c. Microstrip transmission line
   d. Isolator and Gyrators

- EXTC / old (Rev) / Computer Communication Networks N-16.
- VII

Q.P. Code : 629000

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

Note :(1) Q. 1 is compulsory
(2) Answer any four out of remaining six questions
(3) Figure to right indicate full marks

1. a) Draw the diagram of sub layer of data link layer and the function of each sub layer. **20**
   b) Comment on CIDR notation.
   c) Compare between OSI model and TCP/IP protocol suit.
   d) Router is an intelligent device, Justify.

2. a) Explain different modes, frames in HDLC protocol **10**
   b) Differentiate between Pure ALOHA and slotted ALOHA **5**
   c) Explain carrier sense multiple access collision detection **5**

3. a) A company is granted the site address 191.256.0.0. The company needs 1024 subnets design the subnet. **10**
   b) Explain connection establishment process using 3 way handshaking of TCP. **10**

4. a) What is flow control? Compare between stop and wait, Go back N and selective repeat ARQ. **10**
   b) What is fragmentation? Explain the fields related to that process. **10**

5. a) What is delay analysis? State Erlang formulas. Explain M/M/1 queue model. **10**
   b) What is role of ICMP? Explain query messages. **10**

6. a) Explain various transmission media in details. **10**
   b) Classify the unicast routing protocol and explain BGP in brief. **10**

7. Write a short note on [**any four**] **20**
   i) UDP
   ii) Link state Vs distance vector routing
   iii) IP datagram
   iv) DHCP
   v) IPv6

B.E. / Sem VII (Rev-2007) EXTC Nov '16

Data Compression & Encryption

Q.P. Code : 628400

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

N.B. : (1) Question **No.1** is **compulsory**.
(2) Answer **any four** out of remaining.
(3) Assume suitable **data** if **necessary** and **justify the same**.

1. Answer in brief (**Any Four**) : **20**
   (a) Give classification of data compression techniques. Also give evaluation parameters for these techniques.
   (b) Explain what are the disadvantages of private key cryptosystems. And how they are avoided in public key cryptosystems.
   (c) Explain predictive techniques for compression with an example.
   (d) What are the redundancies present in digital images? How are they exploited in lossy image compression?
   (e) What are hash functions? Give requirements on hash functions.

2. (a) Explain the principle of arithmetic coding with an example. Hence generate a decimal tag for the sequence : **ppqqrqr** given the probability model : **10**

Symbol	p	q	r
Count	37	38	25

   (b) Perform minimum variance Huffman coding and find code efficiency for the following model : **10**

Symbol	**Probability**
A	0.45
B	0.3
C	0.15
D	0.1

3. (a) Give the block diagram of a lossy JPEG encoder and decoder. Explain the encoder in detail. **10**
   (b) Explain auditory masking and temporal masking related to audio compression. Also explain the working of a MP-III encoder with a block diagram. **10**

TURN OVER

4. (a) What is the principle of video compression? Explain how motion vectors are computed and coded. **10**

   (b) Give the different techniques for dictionary compression. Explain **any one** with a suitable example. **10**

5. (a) Give the block diagram of DES encryption. Explain one round in detail. **10**

   (b) Explain "Meet-in-the-middle-attack" in triple-DES. **10**

6. (a) What are Digital Signatures? Illustrate how can you use RSA encryption-decryptions scheme for authentication? **10**

   (b) What are key - exchange algorithms? Illustrate the Diffie-Hellman key exchange algorithm with a suitable example. **10**

7. Write short notes on **any two** : **20**

   (1) A-law and μ-law for audio compression

   (b) Intrusion Detection Systems

   (c) Firewalls design principles

   (d) Viruses and worms
