BE / Sem VII / Old (R-2007) / EXTC / MCS / May 2017

QP CODE: 628800

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 soft and hard handoff in mobile cellular system.
(b) Explain GSM features and services.
(c) Differentiate between WCDMA and CDMA 2000.
(d) Explain factors influencing small scale fading.
(e) Explain channel assignment strategy in mobile cellular system.

Q.2(a) With neat diagram explain forward link traffic channel in IS-95 CDMA system. (10)
(b) Explain RAKE receiver in detail. (10)

Q.3(a) Compare SDMA, TDMA, FDMA and CDMA. (10)
(b) Explain with neat diagram mobility management in CDPD. (10)

Q.4(a) Explain various methods used to increase system capacity. (10)
(b) With neat diagram explain GPRS architecture. (10)

Q.5(a) Explain power control in 3G system. (10)
(b) Explain knife-edge diffraction model. (10)

Q.6(a) Discuss services and features of IMT 2000 system. (05)
(b) 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. (05)
(c) Explain security algorithm in GSM. (10)

Q.7(a) Consider that a geographical service area of a cellular system is 420 sq km, a total of 1500 radio channels are available for handling traffic. Suppose the area of a cell is 12 sq km. Calculate (10)
(1) How many times would the cluster of size 4 have to be repeated in order to cover the entire service area, what will be system capacity.
(2) If the cluster size is increased from 4 to 7 what will be system capacity.
(b) Explain GSM architecture, and function of each block. (10)

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MD 4

Q.P. Code : 628902

(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**.
(3) **Figures** to the **right** indicate **full** marks.

1. (a) Explain Microwave propogation in ferrites. 5
(b) With neat diagram explain working of two cavity Klystron. 5
(c) Use the Smith Chart to find the reflection coefficient corresponding to a load impedance : $Z_L = (2 - 2j)\, Z_o$ 5
(d) State and explain Lorentz Reciprocity theorem. 5

2. (a) Explain the working and derive S-matrix for a two hole directional coupler. 10
(b) Match a load impedance $Z_L = 60 - j80\ \Omega$ to a $50\ \Omega$ line using a double stub tuner. The stubs are open circuited are spaced $\lambda/8$ apart. The match frequency is 2 GHz. 10

3. (a) Derive expression for phase velocity, cut off frequency, cut off wavelength and field equation for circular waveguide. 10
(b) A Loss free transmission line of characteristic impedance $50\ \Omega$ is terminated with a real impedance of $30+j100\ \Omega$. If the line is lengthened by $0{\cdot}093\ \lambda$, what is the value of the new termination required to ensure that the impedance seen by the generator is unchanged ? 10

4. (a) Describe operation of following devices using Faraday's rotation principle: 10
(i) Isolator
(ii) Gyrator
(b) Discuss the operation of backward wave devices. 10

[TURN OVER]

Q.P. Code : 628902

5. (a) (i) Discuss the difference between transfered electron devices and avalanche transit time devices. Give example. **10**

(ii) Discuss the factors that limit the high frequency response of a microwave BJT.

(b) Mention different types of electron flow. Explain Brillouin flow and derive an expression for Brillouin magnetic field Br. **10**

6. (a) Describe operation of O-type and M-type devices in brief. Explain the working of Gyrotrons. **10**

(b) Explain the working of (i) Coupled line filters, (ii) Filters using coupled resonators. **10**

7. Write short notes on the following :—

(a) Triple stub matching **5**

(b) Phase shifters **5**

(c) Detectors and Mixers **5**

(d) VSWR and Smith Chart. **5**

/SEM VII / EXTC / T4917 / T1210 COMPUTER COMMUNICATION NETWORKS / MAY 2017
R-2007
Old

Q.P. Code : 629002

(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) What is port address? What is significance of port address? **20**
   b) Differentiate between circuit switching and packet switching.
   c) Compare Go back N and Seletive repeat ARQ protocol.
   d) Explain ALOHA and Slotted ALOHA.
   e) Explain bit stuffing and byte stuffmg.

2. a) What does the term error control mean in data link layer? Derive expression for efficiency of stop and wait flow control. (assume channel to be error free) **10**
   b) Discuss various network topologies. Give advantages and disadvantages of each topology. **10**

3. a) Explain in detail HDLC protocol with all the frame types supported by HDLC. Differentiate between HDLC and PPP protocols. **10**
   b) What is OSI model of network architecture? Explain advantages and disadvantages of OSI model. Explain data encapsulation in OSI model. **10**

4. a) What is exterior and interior routing? Explain in brief distance vector routing and Link state routing **10**
   b) Write a note on IEEE 802.3 standard in detail. **10**

5. a) Explain IP datagram format in detail. **10**
   b) Discuss Queuing system classification. Explain M/M/I queuing system. **10**

6. a) Explain the meaning of various fields in the TCP header format. **10**
   b) Explain Bellman ford Algorithm using graph. **10**

7. Write short notes on **20**
   i) Count to infinity problem in routing protocol
   ii) Collision and Broadcast domain
   iii) ARP and RARP

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Q.P. Code : 628401

(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) Explain the working of ADPCM audio compression.
   (b) Explain the concept of Information Theory with respect to Data Compression.
   (c) What are Active and passive attacks on the security of a system? Compare conventional and public key encryption.
   (d) Write a short note on Discrete Cosine Transform.
   (e) Differentiate between Substitution Cipher and Transposition Cipher.
   (f) Describe the features of Video Compression as compared to Image Compression.

2. (a) Write a short note on μ-law and A-law companding. **10**
   (b) Consider a Diffie-Hellman scheme with a common prime q = 11 and a primitive root $\alpha = 2$. **10**
      (i) Show that 2 is primitive root of 11.
      (ii) If user A has public key $Y_A = 9$, what is A's private key X_A?
      (iii) If user B has public key $Y_B = 3$, what is the shared secret key K?

3. (a) Calculate public key and private key based on RSA algorithm choosing 5 and 11 as two prime numbers. Use these keys to encrypt and decrypt a plain text input of N = 17. **10**
   (b) Describe various approaches for image compression and discuss any one of them in detail. **10**

TURN OVER

4. (a) Solve for x using Chinese Remainder Theorem : **10**

$x = 1 \bmod 2$

$x = 1 \bmod 3$

$x = 3 \bmod 5$

$x = 1 \bmod 7$

(b) Explain the MPEG standard for video coding. **10**

5. (a) Encode the data "SWISS MISS" using arithmetic coding and thus decode it to recover the original data. **10**

(b) Encode and decode the following sequence using LZ – 77 and LZ –78 algorithm "sir_ sid_eastman_ easily_ teases_ sea_ sick_ seals". **10**

6. (a) Give overall block diagram of the DES standard. Explain one round in detail. **10**

(b) What are MAC and Hash functions? Give one example of each. Also explain what are the requirements on MAC and Hash functions. **10**

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

(1) MPEG – 3 Audio compression standard

(b) JPEG – 2000 standard

(c) Viruses and worms
