

27/05/13

ME (EXTC) old II
Mobile Comm. System

AGJ 1st half (e+) 34

Con. 8967-13.

BB-7573

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.

(2) Out of remaining questions, attempt any four questions.

1. (a) Explain important specification of DECT system. 5
(b) Explain the signalling steps to connect a PSTN user to mobile subscriber in a wireless cellular network. 5
(c) Explain the capacity improvement measures in case of wireless cellular network.
(d) Explain the common control channels in case of GSM network. 5
 2. (a) In relation to GSM system, explain the following terms :- 10
(i) Adaptive frame alignment
(ii) Adaptive power control
(iii) Discontinuous transmission and reception.
(b) Draw functional model for DECT. Show its radio channel structure. Explain it. 10
 3. (a) Explain numbering, routing and billing aspects of universal personal telecommunication. 10
(b) Write about radio aspects, transmission modes, spectrum efficiency and sharing in IMT 2000. Explain how interfaces of IMT 2000 provide seamless global roaming. 10
 4. (a) Explain Intelligent cell concept and its applications. 10
(b) Give the details of services, configurations and standards of PMR. 10
 5. (a) Compare TETRA with GSM. 10
(b) List services provided by direct mode operation of TETRA system. Explain direct mode channel and call set up procedure. 10
 6. (a) Describe TETRA system architecture and its components. 10
(b) Write about circuit mode connection entity (CMCE) in TETRA system. 10
 7. Write short notes on the following (any four) :- 20
(a) Logical channel in TETRA system
(b) RAKE Receivers
(c) Power control, soft hand off in IS-95
(d) PMR user community
(e) SNMP model of managed network
(f) Teleservices in TETRA system.
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ME / EXTC / II (OLD)

31/5/13

Data Compression methods

P3-upq-Feb.-13KL-255 A4 E

Con. 9952-13.

BB-7582

(3 Hours)

[Total Marks : 100

N.B. :(1) Question No. 1 is compulsory.

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

1. (a) Describe the different models used for data-compression techniques. 10
(b) Explain in detail the different measures and performance of data compression techniques. 10
 2. (a) Explain the adaptive Huffman coding method with an example. 10
(b) Compare standard Huffman coding with arithmetic coding. 10
 3. (a) Explain PPM algorithm with an example. 10
(b) Explain the concept of static and dynamic dictionary. Explain with a suitable example the encoding process for LZW. 10
 4. (a) Explain the various steps in speech compression. 10
(b) What are the advantages of transform coding over other techniques used for image compression ? 10
 5. (a) Compare adaptive DPCM with Delta Modulation. 10
(b) What is 'Motion Compensation' with respect to video compression ? 10
 6. (a) Explain the working of Linear Predictive Coder. 10
(b) Explain in detail the Run Length Encoding. 10
 7. Write short notes on (any two) :— 20
 - (a) Sub-band coding
 - (b) JBIG standard
 - (c) JPEG
 - (d) MPEG.
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ME/EXTC/II (Old) 21/05/2013
Advanced Digital Communication

vs-Com-2013-44

Con. 8953-13.

BB-7567

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question NO.1 is compulsory.
(2) Attempt any four out of the remaining six questions.

Q1. Write short notes on; [20]

- Average mutual information and Entropy
- Linear modulation with memory
- Vector quantization
- Kraft inequality

Q2.(a) Compare source coding with channel coding. Explain spectral waveform coding. [10]

- Generate a standard Huffman code for a source A {a, b, c, d, e} with probabilities {0.15, 0.05, 0.25, 0.20, 0.35} respectively. Also find the average length, entropy, efficiency and redundancy of the code. [10]

Q 3. (a) Describe the basic concept of ISI. State and prove Nyquist theorem for band limited signals. [10]

- Describe the need for the generation of P-N sequence in the implementation of DSSS. [10]

Q4.(a) Explain the working of QFSK transmitter and receiver. [10]

- Explain Viterbi algorithm for MLSE of the information sequence. [10]

Q5.(a) What are linear equalizers? Explain peak distortion criteria for linear equalizers in detail. [10]

- What is Continuous phase modulation (CPM)? Draw the phase trajectory for binary CPFSK. [10]

Q6.(a) Explain the working of FHSS in detail [10]

- For a binary data 1 0 0 0 0 1 1 1 0 1 0, draw the output waveforms for duobinary encoder with pre coder. What are the drawbacks of duo binary encoder? Derive the transfer function and plot it. Also derive the impulse response. [10]

Q7. Discuss any two in details: [20]

- Kalman Algorithm
 - Adaptive delta modulation and its advantages over delta modulation
 - Markov Process
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14/5/13

ME (E+TC) OLD SEM II
Sert. Comm. Sys. May 2013

P4-RT-Exam.-Feb.-13-2-281

Con. 8471-13.

BB-7555

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions from remaining.
(3) Assume **suitable** data wherever **necessary**.

1. Attempt any **four** of the following :- **20**
 - (a) Explain briefly the power sub-system in satellite.
 - (b) Explain Cross-polarization isolation and cross-polarization discrimination.
 - (c) Explain Reliability of satellite communication system.
 - (d) Compare LEO, MEO and GEO.
 - (e) Discuss the advantages and disadvantages of high inclination elliptical orbit.
 2. (a) Explain with block-diagram Receive-only type of Earth Station. **10**
(b) Discuss satellite launching mechanism, giving launching orbit. **10**
 3. (a) Describe the symmetrical, offset and cassegrain mounting of parabolic reflector. **10**
(b) Explain, Transparent and Regenerative type of repeater. **10**
 4. (a) Discuss how demand assignment may be implemental in a TDMA network. What is the advantage of TDMA over FDMA in this respect ? **10**
(b) Explain what is meant by full inter connectivity in connection with satellite switched TDMA. Explain the process for four beams. **10**
 5. (a) Explain attitude control for :- **10**
 - (i) Spinner type space craft and
 - (ii) Three-axis stabilised space craft with respect to roll pitch and yaw axes.
(b) Describe orbital peturbations. Explain and give expressions for the rate of regression of nodes and rate of rotation of the line of apsides due to the abateness of the earth. **10**
 6. (a) Explain why some satellite employ cylindrical solar arrays, where as other employ solar-soil arrays for the production of primary power. Why is it necessary for satellites to carry batteries in addition to solar-cell arrays ? **10**
(b) Explain why there is only one-geo stationary orbit. Derive an expression for Range from an earth station to a gcstationary satellite in terms of earth's radius, the height of the geostationary orbit above the equator and the elevation angle of the earth station antenna. **10**
 7. Explain :- **20**
 - (a) VSAT Network
 - (b) Link-design in Satellite
 - (c) High power amplifier and its limitations
 - (d) SPADE System.
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M.E (EXTC) Part II (0)

Microw Devices &
Amplitude
Design

BB-7549

(3 Hours)

Total Marks : 100

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

1. (a) What is the stability criteria of an amplifier. 5
 (b) Explain single and double stub matching. 5
 (c) Explain S-parameters for two port network. 5
 (d) Explain in brief the working of quarter wave transformer. 5
2. (a) Explain the properties of S-parameters. 10
 (b) Explain with neat diagram the operation of IMPATT diode. 5
 (c) What is unilateral figure of merit of an amplifier. 5
3. (a) A certain GaAs MESFET has the following S-parameters measured at 9 GHz with 10
 50 Ω resistance reference.
 $S_{11} = 0.45 \angle -60^\circ$
 $S_{12} = 0.09 \angle 70^\circ$
 $S_{21} = 2.50 \angle 74^\circ$
 $S_{22} = 0.80 \angle -50^\circ$
 Design an amplifier for an operating power gain of 10dB.
 (b) Explain thermal noise and shot noise in constant noise figure circles. 10
4. (a) Explain the conditions of oscillations. Derive the condition for stable and sustainable 10
 oscillation in one and two port negative resistance oscillators.
 (b) A certain GaAs MESFET is to be designed for use of frequency range 5.8 to 6.2 10
 GHz. Its center frequency is 6GHz. The various parameters at 6 GHz with 50 Ω
 resistance are –

$$\begin{aligned} \Gamma_{sm} &= 0.761 \angle 177^\circ \\ \Gamma_{im} &= 0.719 \angle 104^\circ \\ G_{max} &= 12\text{dB} \end{aligned}$$

Design i) The input
 ii) The output matching network
 With 50 Ω reference for maximum power gain.

[TURN OVER

5. (a) A certain GaAs MESFET has the following S-parameters measured at 9 GHz with 50 Ω resistance. **10**

$$S_{11} = 0.64 \angle -170^\circ$$

$$S_{12} = 0.05 \angle 15^\circ$$

$$S_{21} = 2.10 \angle 30^\circ$$

$$S_{22} = 0.57 \angle -95^\circ$$

- Compute
- i) delta factor Δ
 - ii) Stability factor k
 - iii) Find the center and radius of input stability circle and plot the circle.

(b) Explain Domain formation and operating modes of Gunn-effect diode. **10**

6. (a) What are different types of 2-port network. Convert h-parameters into Z-Y and ABCD Networks. **10**

(b) Explain Mason's signal flow rule. **10**

7. Write short notes on :-

(a) Smith chart and compressed Smith chart **5**

(b) Power gain equations **5**

(c) d.c. biasing circuits for MESFET's **5**

(d) RWH mechanism. **5**