

3/6/2013

T.E (EXTC) Sem VI (A)

D : PH (April Exam) 323

Con. 10062-13.

Industrial Economics
Telecom Regulation GS-1405

(2 Hours)

[Total Marks : 50

- N.B. (1) Question No. 1 is compulsory.
(2) Attempt any **four** questions from remaining **six** questions.

1. Write any **two** of the following questions :-
 - (a) New Telecom Policy, 1999. 5
 - (b) Explain Maslow's Theory of Motivation. 5
 - (c) Compare Direct and Indirect taxes. 5
 - (d) Define law of demand. Explain factors affecting demand curve. 5
 2. (a) Define Balance and Payment. Discuss its impact on economy of a nation. 5
(b) Discuss multiple credit creation. 5
 3. (a) Write short notes on Black money. 5
(b) Explain Taylor's Scientific Management Theory. 5
 4. (a) Discuss role of TRAI. 5
(b) Compare monopoly and oligopoly. 5
 5. (a) Define devaluation. Discuss the impact of devaluation on an economy. 5
(b) Write short note on Broad Band Policy, 2004. 5
 6. (a) Explain various sources of Public Revenue. 5
(b) Define marketing. Discuss 4P's principle of marketing. 5
 7. (a) Explain ITU's role in Global Communication. 5
(b) Explain functions of Central Bank. 5
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7/6/13

TELEXTC / VI (R.)

Digital Telephony

163 : 1ST HALF-13 (s)-JP

Con. 10104-13.

GS-1585

(3 Hours)

[Total Marks : 100

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

1. (a) Give components of switching system and function's of switch. 5
(b) ISDN components and reference points. 5
(c) ATM cell header format and ATM applications. 5
(d) Define RSVP. How quality of service maintain using RSVP ? 5
2. (a) What do you mean by signaling ? How different types of signaling tones used in signaling ? 10
List functions of signaling. calls
(b) During busy hours 1200 calls were altered to a group of trunks and six calls were 10
lost. The average call duration was 3 minutes, find :—
 - (i) The traffic offered
 - (ii) The traffic carried
 - (iii) The traffic lost
 - (iv) The trade of service
 - (v) The total duration of period of congestion.
3. (a) Derive the :— 10
 - (i) Erlang - B formula – probability of blocking
 - (ii) Erlang-C-formula—probability of delay and system utilization.
(b) Compare TST and STS switch ? Explain the working of TST and STS switch with 10
proper basis diagram.
4. (a) Explain B-ISDN services and B-ISDN protocol reference model. 10
(b) Explain OSI (open system, Interconnect) system the TCP/IP stack. 10
5. (a) Explain ATM physical layer and ATM protocol stack. 10
(b) Explain basic structure of LAPD using LAPD format. 10
6. (a) Explain ISDN channel structure use for providing service. Give the details of user 10
network configuration.
(b) Explain multiple stage switching, Non-blocking switches and Blocking switches. 10
7. Write notes on (any three) :— 20
 - (a) ISDN protocol structure
 - (b) SS7 signaling elements
 - (c) ATM adaptation layer (AAL)
 - (d) Use of compressed header in RTP.

7/6/13

J-E Sem VI Rev May-June 2013

EXJC - NNFL

162 : 1ST HALF-13 (s)-JP

Con. 9983-13.

GS-1594

(3 Hours)

[Total Marks : 100

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

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

(3) Draw **neat** labelled **diagram** wherever **necessary**.

(4) Answers to **each** new questions to be started on a **fresh** page.

1. (a) Model the following as a fuzzy set using suitable membership function – 6
“Numbers close to 5”.
- (b) Distinguish between Supervised and Unsupervised learning with suitable example. 6
- (c) Explain the perceptron convergence algorithm for the single layer perceptron. 8
2. (a) Explain with suitable example Linearly and Non-Linearly separable pattern 10
classification.
- (b) What is self-organizing map ? Explain the Kohonen’s self organizing map with learning 10
algorithm.
3. Design a fuzzy controller for a train approaching station. Inputs are speed and distance 20
and output is break-power. Use triangular membership function. Consider two descriptors
for input and three descriptors for output. Device a set of rules for control action and
defuzzification. The design should be supported by figures wherever possible. Design a
fuzzy controller for a train with high speed and small distance.
4. (a) What is the Hopfield model of the Neural network ? Explain Energy minimization 10
function used in Hopfield model.
- (b) Explain with suitable diagram error back propagation training algorithm. 10
5. (a) Explain Brain-state-in-a-box model and explain how it is used for clustering with 10
suitable example.
- (b) Define RBF networks. Compare the RBF network with Multilayer perceptron. 10
6. (a) Explain Boltzman machine with architecture and algorithm. 10
- (b) Explain any four defuzzification methods with suitable diagrams. 10
7. Write short notes on (any two) :— 20
 - (a) ANFIS
 - (b) Genetic Algorithm and its application
 - (c) Learning vector quantization and its application
 - (d) Solving EXOR problem using MLP and RBF.

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

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

1. (a) What do you understand by the term four point tracking ? 5
 (b) Explain frequency agility and diversity techniques. 5
 (c) Explain in brief the system losses in the Radar. 5
 (d) Explain doppler shift and its role in Pulsed and CW RADAR. 5
2. (a) What do you understand by the term clutter ? Explain the different types of radar clutter. Enumerate the properties of sea and land clutter. 10
 (b) What is the drawback in simple CW Radar ? How it is overcome in CW-IF Radar ? Draw and explain CW-IF Radar in detail. 10
3. (a) Derive the simplified version of radar range equation in terms of minimum detectable signal to noise ratio $(S/N)_{min}$. Also explain why $(S/N)_{min}$ is a better measure of a radar detection performance than in minimum detectable signal (S_{min}) . 10
 (b) What do you understand by the terms duty cycle and unambiguous range of a radar ? What is the technique employed for resolving range ambiguifier ? 10
4. (a) What is delay-line canceller ? Draw and explain its frequency response. 10
 (b) Draw and explain with block diagram MTI Radar system. What are its limitations ? 10
5. (a) Differentiate between Amplitude comparison and Phase comparison methods of monopulse tracking. 5
 (b) Explain in brief radar resolution cell. 5
 (c) What do you understand by the term RCS fluctuations ? Explain different swerlings model for RCS fluctuations. 10
6. (a) Describe the chief characteristics of the radar echo from a target when its radar cross section is in the – 10
 (i) Raleigh region (ii) Resonance region (iii) in the optical region.
 (b) With a suitable block diagram explain the working of a conical scan tracking radar. Explain the various factors that need to be considered in determining the optimum squint angle. 10
7. Write short notes on the following :-
 (a) Comparison of Trackers 5
 (b) Factors which influence the bandwidth of a radar receiver. 5
 (c) Phased array radar 5
 (d) FM-CW altimeter. 5

TE-SEM-VI (EXTL) (REV.)

D.C.

23/5/13
May 2013

ws-Con-2013-31

Con. 9195-13.

GS-1120

(3 Hours)

[Total Marks : 100

Note: i) Question no 1 is compulsory

ii) Solve any four out of remaining questions

iii) Figure to the right indicate full marks

Q1 Answer the following questions (Any four)

[20]

- Does the channel bandwidth requirement reduce by a factor of four in QPSK compared to BPSK?
- Does bandwidth restriction limit the use of Hadamard codes?
- Is it true that convolutional interleaving requires less memory and offers more flexibility?
- What are the different parameters which need to be examined before choosing a PCM waveform for a particular application?
- Derive the condition for maximum entropy of a source. How does entropy vary with probability?

Q2 a. Consider five messages given by the probabilities 0.5, 0.25, 0.125, 0.0625, 0.0625. Calculate H.

Use the Shanon-Fano Algorithm to develop efficient code and, for that code calculate the average number of bits/message. Compare with H. Calculate efficiency and redundancy. [08]

Q2 b. Consider a systematic block code whose parity check equations are:

[12]

$$P_1 = m_1 + m_2 + m_4$$

$$P_2 = m_1 + m_3 + m_4$$

$$P_3 = m_1 + m_2 + m_3$$

$$P_4 = m_2 + m_3 + m_4$$

Where m_i is the i^{th} message digits and P_i are the i^{th} parity digits.

- Find the generator matrix and parity check matrix
- How many errors can be detected and corrected?
- If the received code word is 10101010, find the syndrome.

Q3 a. The bit stream $d(t)$ is to be transmitted using DEPSK. If the $d(t)$ is 0010 1001 1010, determine $b(t)$.

Show that after decoding, the data $d(t)$ is recovered. Show that if the fourth bit is in error, then

fourth and fifth bits, $d(t)$, will also be in error. [10]

Q3 b. What is M-ary PSK? Explain with constellation diagram. What is Euclidian distance for M-ary PSK?

Draw and explain 8-ary PSK system with constellation. What is the bandwidth of M-ary PSK? [10]

[TURN OVER

Q4 a. Can there be tradeoff between signal to noise ratio and bandwidth in calculation of channel capacity? Prove the upper limit of C is $C_{\infty} = 1.44 \frac{S}{\eta}$. [12]

Q4 b. For a (7, 4) cyclic code, the generating polynomial $g(x) = 1 + x + x^2$. Find the code word if data is (i) 0011, (ii) 0100. Show how cyclic code is decoded to get data word for previous case. [08]

Q5 a. Derive the expression for minimum probability of error for a matched filter. [08]

Q5 b. Generator vectors for a rate 1/3 convolutional encoder are: $g_1 = (101)$, $g_2 = (100)$, $g_3 = (111)$. Draw Encoder diagram, trellis diagram, using trellis find code vector if message vector is (101100), using Trellis find message vector, if third bit of code vector is in error. [12]

Q6 a. What is the necessity of equalizers in a transmission system? Explain any one equalizer. [10]

Q6 b. What is MSK? Draw and explain MSK transmitter and receiver. How it is different than GMSK. [10]

Q7 Write a note on any three: [20]

- a) Eye pattern and its application
 - b) Line code and its characteristics
 - c) Effect of Intersymbol interference
 - d) Block diagram of digital communication system
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- N.B.** (1) Question No. 1 is **compulsory**.
(2) Solve any **four** questions from the **remaining** questions.
(3) Assume **suitable** data if **required**.

1. (a) Explain significance of directivity and radiation pattern of antenna. 5
(b) Describe the concept of near field and far field radiation. 5
(c) Discuss the voltage and current distribution of a half wave dipole antenna. Can we say the antenna is resonant? 5
(d) Differentiate between broadside and end fire array. 5
 2. (a) Explain the significance of the term "Effective Area of an Antenna". Derive the relationship between effective area and directivity of any antenna. 10
(b) Describe parabolic reflector and its use of microwave frequencies. Discuss Cassegrain method of feeding the parabolic reflectors. 10
 3. (a) State and derive FRISS transmission equation. 10
(b) What is the maximum power received at a distance of 0.5 km over a free space 1 GHz circuit consisting of a transmitting antenna with a 25 dB gain and a receiving antenna with a 20 dB gain. The transmitting antenna is fed with 150 W of power. 10
 4. (a) Explain V antenna and rhombic antenna. List their advantages and disadvantages. Mention their applications. 10
(b) Explain and derive equations for total electric field, directivity, half power beam width in case of two isotropic point sources of same amplitude but opposite phase. 10
 5. (a) Explain the difference in driven and parasitic elements in an antenna array. Differentiate between a director and a reflector. 10
(b) Explain the formation of inversion layer in the troposphere and the phenomenon of duct propagation. Which factors help in the formation of duct? 10
 6. (a) Derive the expression for vector potential wave equation. 10
(b) Explain different types of horn antennas. Find the directivity and beamwidth. 10
 7. Write short notes on :— 20
 - (a) Ionospheric propagation
 - (b) Log periodic antenna
 - (c) The equivalent noise temperature of an antenna
 - (d) Folded dipole and its applications.
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TE VI
TE (EXTC) MP & MC-II (Rev)

102 : 1ST HALF-13 (q)-JP

11/5/2013

Con. 7241-13.

GS-9789

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.
(2) Solve any **four** questions from the remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** wherever **necessary**.

1. (a) Design 8086 microprocessor based system using minimum mode with following 10 specifications :—
(i) 8086 microprocessor working at 8 MHz
(ii) 32 kB EPROM using 16 K × 8 devices
(iii) 32 kB SRAM using 16 K × 8 devices.
Clearly show memory map with address ranges. Draw a neat schematic.
- (b) What is segmented memory and what are its advantages ? Explain logical and physical 5 address in 8086.
- (c) Explain features of PIC 18F microcontroller. 5
2. (a) Draw and explain interfacing of 8086 with 8255. 10
(b) Explain data and program memory organization of PIC 18F microcontroller. 10
3. (a) Give flowchart and assembly language program for 8086 to subtract two 4 digit 10 BCD numbers.
- (b) Explain the following instructions of PIC 18F microcontroller :— 10
(i) DAW
(ii) MOVLB 0 × 06
(iii) TBLRD*+
(iv) SLEEP
(v) RETLW 0 × 15
4. (a) Explain interrupt structure of 8086. 10
(b) Explain addressing modes of PIC 18F microcontroller. 10

[TURN OVER

Con. 7241-GS-9789-13.

2

5. (a) Interface 8259A to 8086 and write initialization instructions for 8259A to meet **10**
the following specifications :—
- (i) Edge triggered, single
 - (ii) Mask interrupts IR1 and IR4
 - (iii) Interrupt vector type for IRO is 60H.
- (b) List and explain stack related and processor control instructions of 8086. **10**
6. (a) Explain 8086 maximum mode of operation in detail. **10**
- (b) Write assembly language program for PIC 18F microcontroller to evaluate the **10**
following expression.
- $$Y = P \times Q + R \times S$$
- where P, Q, R and S are 8 bit numbers, which are located at memory locations
 0×20 to 0×23 . Store the result Y in memory locations 0×24 to 0×26 .
7. Write short notes on any **four** of the following :— **20**
- (a) PIC 18F pipelining
 - (b) PIC 18F STATUS register
 - (c) Memory banking in 8086
 - (d) Modes of DMA transfer
 - (e) PIC 18F microcontroller RESET.
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29/5/13

T.E (EXTC) Sem VI Rev.
Television & Video Engg.

14 : 1st half.13-shilpa(J)

Con. 9557-13.

GS-1270

(3 Hours)

[Total Marks : 100

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

(2) Attempt any ~~three~~^{four} questions out of remaining six questions.

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

(4) Assume suitable data if necessary.

1. (a) List the type of AGC and only describe the basic operation of AGC used in TV Receiver. 5
- (b) What is color burst ? What is the importance of Black porch in CVS ? 5
- (c) Explain compatibility consideration in TV system. 5
- (d) State the specification of CCIR-B monochrome TV system. 5
2. (a) Explain Interlaced scanning in detail with the help of neat diagram also explain how it is better than sequential scanning. 10
- (b) Draw the neat block diagram of NTSC coder and decoder and explain its functioning. 10
3. (a) Draw neat diagram to indicate sync separator section in TV system and explain it. 10
- (b) Explain PAL coder system ? How phase error are cancelled in PAL system ? 10
4. (a) Compare Delta gun, PIL and Trinitron colour picture tube. 10
- (b) Give Reason :-
 - (i) Why (G-y) signal is not selected for transmission ? 5
 - (ii) All TV standards have odd no. and lines. 5
5. (a) With the help of neat sketch, explain the functioning of image orthicon Camera tube. State its drawbacks. 10
- (b) Draw Digital TV receiver system and explain its working. 10
6. (a) What is EIA test pattern ? Draw and explain EIA pattern with utility. 10
- (b) With the help of neat diagram explain the functioning of cable television. 10
7. Write short notes on :- 20
 - (a) HDTV
 - (b) Flyback transformer
 - (c) Chromaticity diagram
 - (d) Frequency interleaving.
