

ETC  
T.E. EATC sem VI (REV) NID-12  
Sub: - AWP.

VI-S III, sem Nov 12-17

Con. 8272-12.

KR-8837

( 3 Hours )

[ Total Marks : 100

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

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

(3) Assume **suitable** data wherever **required**.

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

1. (a) Explain isotropic, omnidirectional and directional antenna with suitable 5 examples.
- (b) An antenna having a gain of 6dB over a reference antenna is radiating 5 700 Watts. Calculate the power the reference antenna must radiate in order to be equally effective in most preferred direction.
- (c) Explain different types of antenna losses. 5
- (d) What do you mean by polarization of an antenna ? How an antenna used 5 for ground wave propagation is polarized ? Why ?
  
2. (a) Discuss Beam solid angle, Beam efficiency and Resolution of an antenna. 10 Discuss practical significance of Beam width. Find the number of radio transmitters distributed uniformly over the sky which an antenna can resolve in terms of its directivity.
- (b) Derive the expressions for electric and magnetic fields for a small loop 10 antenna. Compare them with those of infinitesimal electric dipole.
  
3. (a) Find the expression for far electric field of a infinite simal electric dipole 10 placed vertically at a height "h" over a perfect electric conducting plane. Draw the field pattern for h = 0.
- (b) Normalised radiation intensity of an antenna is given by – 10
$$U = \sin \theta \sin \phi \quad 0 \leq \theta \leq \pi \quad \text{and} \quad 0 \leq \phi \leq \pi$$
$$= 0 \quad \text{else where}$$
Find exact directivity, azimuth plane HPBW and elevation plane HPBW.
  
4. (a) Explain Friis transmission Formula. A series of microwave repeater links 10 operating at 10 GHz are used to relery TU signals into a valley surrounded by mountains. The transmitting and received antennas of each repeater are identical horns with a gain of 15 dB. Repeaters are seperated by 10 kms. Loss due to polaritation mismatch is 3 dB. Assume matched loads and free space propagation conditions. For acceptable S/N ratio at receiver to be greater than 10 n. watts, determine minimum transmitter power.
- (b) Define various antenna apertures. Derive the relation between maximum 10 effective aperture and maximum directivity of an antenna.

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5. (a) List the parameters that decide the overall pattern of an antenna array. 5  
(b) A broad side array consists of four isotropic sources with a distance of  $\lambda/2$  between them. Find array factor, directions of major lobe, directions of minor lobe maxima, directions of minima, HPBW and FNBW. Plot the pattern. 15
6. (a) Explain different types of feed systems for paraboloidal reflectors. Find FNBW and gain of paraboloidal reflector antenna of 2 m diameter and operating at 6000 MHz. 12  
(b) What is folded dipole ? Find its radiation resistance. Discuss its applications. 8
7. (a) Explain ionospheric propagation. Define critical freq., MUF and OMF. 10  
(b) A high frequency radio link has to be established between two points at a distance of 2500 km on earth's surface. Considering the ionospheric height of 200 km and critical frequency of 5 MHz, calculate MUF for given path. Derive the formula used. 10

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# Digital Communication

VI/R/Ex-12

04/12/12

ws-Con-2012

Con. 8193-12.

(3 Hours)

KR-8990

[Total Marks : 100

- N.B. :-
- Question No 1 is compulsory.
  - Solve any 4 out of remaining questions.
  - Figure to the right indicate full marks.

- Answer the following questions (Any Four) [20]
  - Differentiate between FSK and MSK?
  - What is the difference between probability of error and bit error rate?
  - What the system link budget tells system engineer?
  - Justify correlative coding introduces controlled amount of ISI?

- Explain the transmitter and receiver of DEPSK system with block diagram, why error occur in pairs in DEPSK system? Give suitable example. [10]
  - A DMS has an alphabet of five symbols with their probabilities as shown: construct a Shannon-Fano code for the source and calculate code efficiency  $\eta$  and redundancy of the code. Repeat the same for Huffman code and compare. [10]

Symbol	M1	M2	M3	M4	M5
Probability	0.40	0.19	0.16	0.15	0.15

- What is the necessity of equalizer in a transmission system? Explain Traversal equalizer. [10]
  - The parity check matrix of a (7,4) linear block code is given below i) find the generator matrix ii) List all code words iii) for the received codeword,  $R=1011110$ , find the syndrome. [10]

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

- Show that duobinary signaling suffers from error propagation while precoded duobinary signal does not. Explain with encoder and decoder block diagrams and decoding logic. [10]
  - Construct a systematic (7, 4) cyclic code using the generator polynomial  $G(X) = x^3 + x + 1$ . What are the error correcting capabilities of this code? Construct the decoding table and for the received codeword 1101100, determine the transmitted data word. [10]

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5. a. Generator vectors for a rate  $1/3$  convolutional encoder are  $g^{(1)} = 110$ ,  $g^{(2)} = 101$ ,  $g^{(3)} = 111$ . Draw block diagram of a encoder, construct encoder matrix and determine code words if input vectors are  $(111)$  and  $(1011)$ . [10]
- b. Derive the expression for minimum probability of error for a matched filter. [10]
6. a. Explain the Trellis diagram and Viterbi algorithm for convolution codes with example. [10]
- b. Explain QASK with definition, constellation, transmitter, receiver and bandwidth. [10]
7. Write notes on any three. [20]
- a) BCH codes
  - b) Shannon-Hartley theorem
  - c) Line codes and its characteristics
  - d) Eye pattern

Con. 8167-12.

KR-9266

(2 Hours)

[Total Marks : 50

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions from the **remaining** questions.  
(3) **All** questions carry **equal** marks.

1. Attempt any **two** of the followings :—
  - (a) Price determination under Perfect Competition. Explain.
  - (b) Major functions of Management. Discuss.
  - (c) Functions of TRAI. Explain.
  - (d) Telecom Policy of 1994. Discuss.
2. (a) Explain the banking structure in India.  
(b) Explain Maslow's need Hierarchy.
3. (a) Explain the meaning of demand for money. What are factors that determine the demand for money ?  
(b) Explain the meaning of devaluation of currency.
4. (a) What are the major functions of Telecommunications Regulation in India ?  
(b) Explain the major sources of public revenue in India.
5. (a) Explain the meaning of 4 P's in marketing.  
(b) Explain the sources and consequences of black money in India.
6. (a) Explain the meaning of Perfect competition.  
(b) Explain the main features of broad band policy in India.
7. (a) Explain the meaning of inflation. Discuss the effects of inflation on common man.  
(b) What the major instruments of monetary Policy of the RBI.