

Sample Question Paper-I

COURSE : ELECTRONICS ENGINEERING GROUP
COURSE CODE : ET/EX/EJ/EN
SEMESTER : FOURTH
SUB TITLE : ANALOG COMMUNICATION
MAX MARKS : 80

9073

TIME: 3 HOUR

Instruction:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q.1.A) Attempt Any Four of following

08 Marks

- a) Define Half Duplex and Full Duplex with the help of sketch.
- b) State the principle of operation of superheterodyne receiver.
- c) State following terms related to antenna.
 - i) Polarization
 - ii) Directivity
- d) State the frequency ranges for following
 - i) Audio Frequency
 - ii) Voice Frequency
 - iii) Microwave Frequency Band
 - iv) VHF frequency band
- e) Draw block diagram of communication system.
- f) State the need for modulation.

Q.1.B) Attempt Any 2 of following

08 Marks

- a) A load of 400Ω is used to match 600Ω transmission line to achieve $SWR=1$. Find out the required characteristic impedance of quarter wave transformer connected directly to the load.
- b) Explain the concept of actual height and virtual height with the help of figure.
- c) Draw AM wave for following conditions
 - 1) i) $f_c=300$ KHz , $3 V_{p_p}$
ii) $f_m=1$ KHz , $1 V_{p_p}$
 - 2) i) $f_c=300$ KHz , $3 V_{p_p}$
ii) $f_m=2$ KHz , $1 V_{p_p}$

Q.2. Attempt Any 3 of following

12 Marks

- a) State sequential steps to perform the experiment of calculating modulating index using Trapezoidal pattern.
- b) Explain the working of PLL based FM detector with the help of block diagram.
- c) Compare loop Antennas and Ferrite rod antenna w.r.t. following points.
 - i) Working Principle
 - ii) Construction
 - iii) Radiation pattern
 - iv) Application
- d) Give the different reasons for Fading.

Q.3. Attempt Any 3 of the following

12 Marks

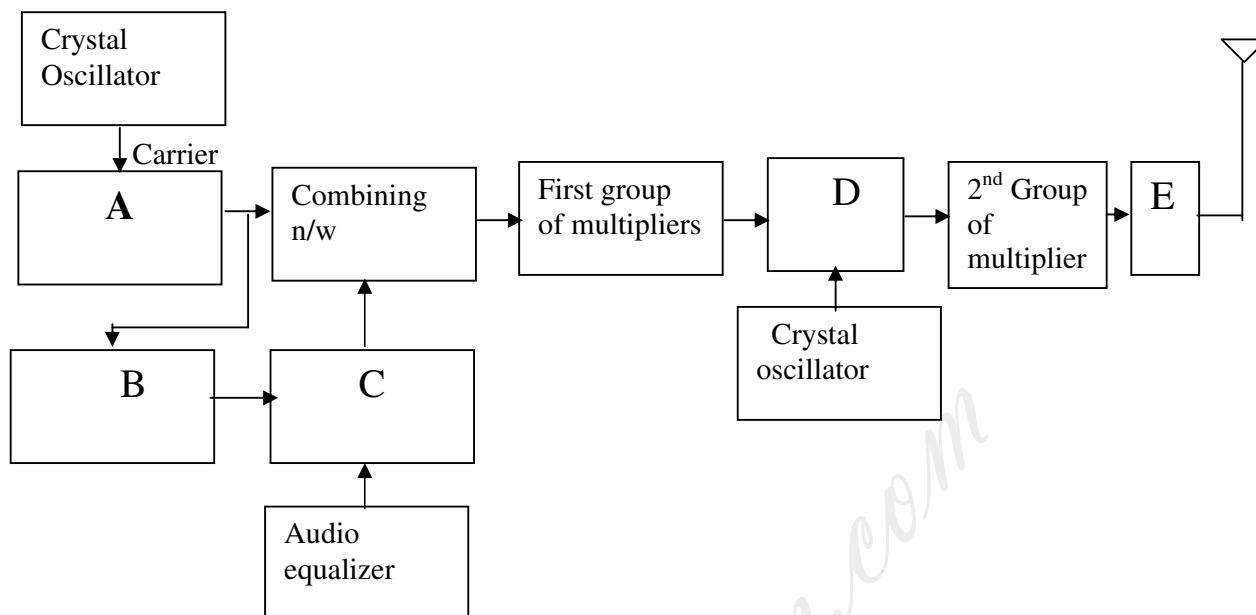
- a) Derive the relationship between transmitted AM power and carrier power. What will happen to total transmitted power if modulation index is unity?
- b) Justify why output voltage of balanced slope detector decreases above and below the resonance frequencies ($f_c + \Delta f$, $f_c - \Delta f$) ?
- c) Draw and explain equivalent circuit of transmission line.
- d) Draw labeled sketch of Yagi-uda antenna .
 - i. state function of each element in antenna.
 - ii. Give applications of Yagi antenna.
 - iii. Draw radiation pattern.

Q.4. Attempt any four of the following

16 Marks

- a). With respect to sky wave propagation define the following terms.
 - i) Virtual height
 - ii) Maximum usable frequency
 - iii) Skip Distance
 - iv) Critical Frequency
- b). Draw radiation pattern for following resonant dipoles for following lengths.
 - i) $L = l$
 - ii) $L = 3l$
 - iii) $L = 3l/2$
 - iv) $L = l/2$ where $L =$ length of dipole.
- c). What is the need of AGC? Explain simple AGC used in radio receiver.
- d). In what way ground wave propagation differs from sky wave propagation.

e). Identify the following block diagram. Label blocks of A,B,C,D,E.



f. Explain the characteristics determining the performance of AM Radio receiver.

Q.5. Solve any three of the following

12 Marks

- What is a stub? Give advantages of stub matching.
- Explain the Duct propagation with sketch and give its applications.
- How amplitude is limited in a ratio detector circuit ?
- Explain FM signal generation using reactance modulator method.

Q.6. Solve any three of the following

12 Marks

- Distinguish between Phase discriminator and Balanced slope detector on the basis of i.)Output characteristic ii.) Linearity iii). Amplitude iv)limiting Application
- Explain standing wave pattern for a transmission line.
- Represent AM signal in frequency domain and time domain.
- What is major lobe, minor lobe and side lobe in radiation pattern.of antenna.