G 1601 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

Branch : Electronics and Communication/Applied Electronics and Instrumentation/ Electronics and Instrumentation Engineering

COMMUNICATION ENGINEERING–I (LAS)

(Old Scheme—Supplementary/Mercy Chance)

[Prior to 2010 Admissions]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries **4** *marks.*

1. Sketch an AM wave with 200 Hz modulating signal of 2 volt peak to peak amplitude, 4 kHz carrier with 50 % modulation.
2. The total power in an ordinary AM wave is 1 kW. Calculate the percentage modulation of the signal if each of the side band contains 75 W power.
3. Compare and contrast low level and high level modulated AM transmitters.
4. Draw the circuit of a varactor diode modulator and show how FM is obtained.
5. What is image frequency ? What are its effects ? Calculate the image frequency of an AM signal with carrier of 825 kHz.
6. What are the needs of AGC ? Distinguish between simple AGC and delayed AGC.
7. Draw the frequency spectrum of the VSB channel of PAL TV system and label the frequencies.
8. What is the pilot carrier system ? Explain its merits and demerits.
9. Distinguish between pulse and tone signalling. Compare them.
10. Draw and explain the block diagram of single line analog SLIC board.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*

Each full question carries **12** *marks.*

11. (a) Clearly explain the need for modulation in Electronic communication system. (5 marks)

    (b) Compare AM, FM and PM systems, bringing out their performances. (7 marks)

Or

Turn over

12. With the help of the sketches of FM wave, derive the expression for an FM signal modulated by a sine signal. Draw and explain its frequency spectrum.

13. Draw the circuit of a collector modulated AM generator. Explain how modulations are produced.

Or

14. Starting with an oscillator working near 500 kHz and using a maximum frequency deviation not exceeding ± 30 Hz at that frequency, calculate the following for an Armstrong system which is to yield a center frequency precisely 97 MHz with a deviation of exactly 75 kHz ; (a) starting frequency ; (b) exact initial deviation ; (c) frequency of the crystal oscillator ; (d) number and types of frequency multipliers in each group, assuming that the multipliers can be only doublers or triplers. Draw the final block diagram.

15. Draw the circuit diagrams of : (i) RF amplifier and (ii) IF amplifier, when an AM receiver is tuned to 825 kHz. Explain the working.

Or

16. Draw the circuits of the following demodulators and describe how the message is recoverd in :

(a) envelope detector ; (b) ratio detector.

17. Mathematically prove that the balanced modulator circuit produces an output consisting of sidebands only, with the carrier suppressed. Other than SSB generation, what applications can this circuit have ?

Or

18. Draw the block diagram of an SSB transmitter using the filter system. Why must the filter have such sharp cut-off outside the passband ? In a transmitter, must this cut-off be equally sharp on each side of the filter's passband.

19. Draw the block diagram of a power line communication system. Explain various units in it ? What are its merits ?

Or

20. With necessary diagrams, explain the Facsimile transmitter and receiver sides. How the images are scanned and recovered ?

(5 × 12 = 60 marks)