

G 1083

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, MAY 2015**

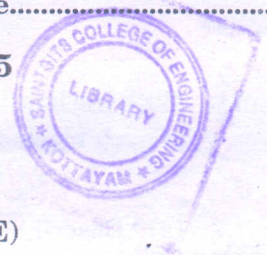
**Seventh Semester**

Branch : Electrical and Electronics Engineering

EE 010 705—COMMUNICATION ENGINEERING (EE)

(New Scheme—2010 Admission Onwards)

[Improvement/Supplementary]



Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 3 marks.*

1. Determine the peak frequency deviation and modulation index for an FM modulator with a deviation sensitivity of 5 kHz/V and a modulating signal of peak amplitude 2 volts and frequency 2000 Hz.
2. Calculate the minimum receivable signal in a radar receiver which has an IP bandwidth of 1.5 MHz and a 9-dB noise figure.
3. Define the principles of differential PCM system.
4. For an 8-PSK system, operating with an information bit rate of 24 kbps, determine baud, minimum bandwidth and bandwidth efficiency.
5. For an earth station transmitter with an antenna output power of 10000 Watts, a back-off loss of 3-dB, a total branching and feeder loss of 3-dB, and a transmit antenna gain of 40 dB, determine the EIRP.

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.*

*Each question carries 5 marks.*

6. Compare Amplitude modulation and Angle modulation.
7. Define the terms; luminance, hue and saturation. Also explain the relation between them.
8. State and briefly explain Kepler's laws.
9. For the binary data 11001101, draw the ASK, FSK and PSK waveforms.
10. In a satellite of bandwidth 500 MHz, how many transponders of 36 MHz can be accommodated? Assume a guard band of  $\pm 2$  MHz. Draw a schematic/spectrum indicating the bandwidth occupied by each transponder if the uplink spectrum is 6525 MHz–7025 MHz.

(5 × 5 = 25 marks)

**Turn over**

**Part C**

Answer all questions.

Each full question carries 12 marks.

11. With the block diagram of an AM super heterodyne receiver with simple AGC, explain the functions of each block of a AM receiver. (12 marks)

Or

12. (a) Describe the working of FM reactance modulator with a schematic diagram. (6 marks)  
(b) Explain the operation of a Ratio detector with a schematic diagram and voltage-versus-frequency response curve. (6 marks)
13. Draw the composite TV video waveform labelling all the pulses. Explain the functions of sync pulses, pre-equalizing pulses, serration and post equalizing pulses. (12 marks)

Or

14. With the aid of a block diagram, explain the operation of colour TV transmitter. (12 marks)
15. (a) What are the basic functions of radar? Draw a functional block diagram of a pulsed radar set, and describe the functions of each block. (8 marks)  
(b) Briefly explain the applications of Radar. (4 marks)

Or

16. Explain the working of continuous wave radar and MTI radar with the aid of block diagrams. Mention their applications. (12 marks)

17. With relevant block diagrams, explain the working of the three basic sections of a satellite system. (12 marks)

Or

18. (a) With a block diagram, explain the operation of a SPADE earth station transmitter. (6 marks)  
(b) Explain the principle of a CDMA system. (6 marks)
19. (a) Explain the working of a delta modulation system. (6 marks)  
(b) For a PCM system with the following parameters, determine minimum sampling rate, minimum number of bits used in the PCM code, resolution, quantization error and coding efficiency :

Maximum analog input frequency = 4 kHz

Maximum decoded voltage at the receiver =  $\pm 2.55$  volts

Minimum dynamic range = 46 dB.

(6 marks)

Or

20. Describe the working of QPSK modulator and demodulator with block diagrams, mathematical expressions, waveforms and constellation diagram

(12 marks)

[5 × 12 = 60 marks]