

GANPAT UNIVERSITY

**B. TECH. SEMESTER V ELECTRONICS & COMMUNICATION ENGINEERING
REGULAR EXAMINATION, NOV-DEC 2012**

2EC505 COMMUNICATION ENGINEERING

Time: 3 HOURS.

TOTAL Marks: 70

Instructions:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks. Assume suitable data, if necessary.

SECTION-I

- Q-1** (A) Define Modulation Index. Explain Under Modulation, Over Modulation and Perfect Modulation With Necessary Diagram. 5
- (B) Explain BJT Amplitude Modulator Circuit. 5
- (C) Give the Advantages of SSB-SC over DSB-FC. 2

OR

- Q-1** (A) Define Modulation. Derive Mathematical Expression of AM-Wave in terms of Modulation Index (m). 4
- (B) Draw and Explain Basic Block Diagram Of Communication System. 5
- (C) A 1.0 MHz Carrier with amplitude 5 V is amplitude modulated by a 400 Hz Sinusoidal Modulating Signal. The depth of Modulation is 60%. Draw the Frequency Spectrum of AM Wave. 3

- Q-2** (A) Explain Indirect Method of FM Generation. 5
- (B) Derive the Equation of Total Average power in Sinusoidal FM. Also Show that in FM the Total Average Power is same Unmodulated Carrier Power. 4
- (C) An AM Transmitter transmits signals at 50 KW with modulation index as 85%. Calculate total side band power in transmitted signal. 2

OR

- Q-2** (A) Explain Foster Seeley Discriminator in detail. 5
- (B) Explain Pre-emphasis and De-emphasis. 3
- (C) An audio signal of 20 KHz causes the frequency of a 10 MHz carrier to deviate by 4.2 KHz when the Instantaneous amplitude is 1.4 V. At some instant, the audio voltage is increased to 25 V. Find the Maximum Frequency deviation and Instantaneous Frequency range of FM signal. 3

- Q-3 (A) List out methods of SSB generation. Explain Filter method in Detail. 5
- (B) What is Balance Modulator? Explain FET Singly Balance Modulator Circuit. 5
- (C) Define : 2
- 1) Sideband Splatter 2) Foot Print

SECTION-II

- Q-4 (A) Define noise. Explain internal noises. 6
- (B) An inductor has series resistance of 7Ω , and inductance of $75\mu\text{H}$. it forms part of series tuned circuit that has Q of 95. Determine resonant frequency. 4
- (C) Explain in brief: service levels provided by satellite. 2
- OR
- Q-4 (A) Receiver tunes a signal from 550 to 1600 KHz and IF is 455KHz, given a two section tuning capacitance with a maximum $350\text{pF}/\text{section}$. Find R_c and R_f for oscillator and RF section. Also find trimmer capacitance. 6
- (B) Derive noise factor for two amplifiers connected in cascade. 4
- (C) List out satellite service types with example. 2
- Q-5 (A) Explain in detail spurious response and adjacent channel selectivity in detail. 4
- (B) Explain mutual inductance and self inductance with figure. 5
- (C) Distinguish between line communication and radio communication. 2
- OR
- Q-5 (A) Explain superheterodyne receiver in detail.(with block diagram) 6
- (B) Define relative response, derive -3dB bandwidth for series tuned circuits. 5
- Q-6 (A) List out types of passive analog filters. Derive transfer function for each. 4
- (B) Explain in detail: Kepler's laws. 3
- (C) Distinguish between Active filters and Passive filters. 3
- (D) Calculate the output SNR in dB for three identical links, given that the SNR for any link is 60 dB. 2

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