Code No.: **10295**

FACULTY OF ENGINEERING

B.E. III/IV Year (ECE) I Semester (Supplementary) Examination, May 2006

ANALOG COMMUNICATIONS

Time : 3 *Hours*] [*Max. Marks* : 75

Answer **all** *questions of* Part A.
Answer **five** *questions from* Part B.

Part A – (Marks : 25)

1. With a neat diagram explain the frequency components of AM wave. 2
2. A tuned circuit of the oscillator in an AM transmitter uses a 50μH coil and 1nF capacitor. Now if the oscillator out put is modulated by audio frequencies upto 8 kHz, then find the freq. range occupied by the side bands. 3
3. Draw the Block diagram of Armstrong method for FM Generation. 2
4. Determine the modulation index m_f of an FM signal. Which is being broad cast in the 88 – 108 MHz band? This FM wave has a carrier swing of 125 kHz.
5. Explain about thermal noise.
6. Explain Noise figure.
7. Explain about double spotting.
8. Distinguish between AGC and Delayed AGC. Also draw the circuit diagram of delayed AGC.
9. Prove that narrow band FM offers no improvement in SMR over AM.
10. What do you mean by synchronization in PAM system?

Part B – (Marks : 5 × 10 = 50)

11. (a) Derive the expression to calculate the power content in AM wave. 5

    (b) Draw the circuit diagram of envelope detector and explain its operation. 5

12. (a) Draw the block diagram of a phase discrimination method and explain its operation and show it can be used to generate VSB signals.

    (b) The SSB transmission contains 10 kW. This transmission is to be replaced by a standard AM signal with the same power content. Determine the power content of the carrier and each of the side bands when the percent modulation is 80%.

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13. (a) What are the drawbacks in foster-seely discriminator and they have been taken care by Ratio detector? Explain with a neat diagram.

(b) A base band signal (modulating signal) $x(t) = 5 \cos 2\pi \times 15 \times 10^3 t$ angle modulates a carrier signal of $A \cos w_c t$

(i) determine the modulation index and B.W. for (1) FM system (2) PM system.

(ii) find the change in the B.W. and modulation index for both FM and PM if the modulating frequency f_m is reduced to 5kHz.

14. Explain with a block diagram the steps involved in calculating noise figure and discuss each step in detail.

15. Draw the Block diagram of superhetrodyne receiver and explain various blocks.

16. (a) Draw the block diagram of AM transmitter and explain its operation.

(b) What is Neutralization? Mention the various Neutralization techniques.

17. (a) What are the different sampling techniques? Explain about instantaneous sampling technique.

(b) Draw the PAM circuit and explain its operation. What are the drawbacks in PAM?