

II B. Tech II Semester Supplementary Examinations, Nov/Dec-2016
ANALOG COMMUNICATIONS

(Electronics and communication Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the questions in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) What is the need for modulation? Explain the main advantages of modulation? (4M)
- b) State the applications of different AM Systems. (4M)
- c) Write down the expressions for WBFM, NBFM and PM? (3M)
- d) Define Detection gain and write down the expression for it. (4M)
- e) List out the drawbacks of pulse amplitude modulated signal? (4M)
- f) Classify radio transmitters based on the type of modulation and Service involved. (3M)

PART -B

2. a) Draw the Envelope detector and illustrate the process of detection of AM wave? (8M)
- b) An amplitude modulated signal represented in time domain as $4\cos(1800\pi t) + 10\cos(2000\pi t) + 4\cos(2200\pi t)$. Sketch the spectrum and calculate the band width and total power? (8M)
3. a) What is DSB-SC modulator? Explain how the ring modulator for generation of DSB-SC wave act as a demodulator? (8M)
- b) A DSB signal is to be generated with a carrier frequency of 1MHz using a non-linear device with input and output characteristics $v_0 = a v_i + b v_i^3$. The output of the non-linear device can be filtered by an appropriate BPF and $v_i = m(t) + \cos(2\pi f_1 t)$. Find the value of f_1 . (8M)
4. a) What is the difference between direct and indirect methods of FM generation? (8M) Explain the working of a balanced frequency discriminator with the help of circuit diagram.
- b) An FM signal is represented in time domain as $s(t) = 10 \cos(2\pi \cdot 10^6 t + 5 \sin 8\pi \cdot 10^3 t)$. Calculate the frequency deviation, modulation index, power and band width. (8M)
5. a) What is FM threshold effect? How to achieve threshold reduction in FM system? (8M)
- b) Discuss the noise performance of AM system using envelop detection? (8M)
6. a) Explain the methods for demodulation of PAM signals? (8M)
- b) Write the comparisons among PAM, PWM and PPM? (8M)
7. a) With the aid of the block diagram explain TRF receiver. Also explain the basic super heterodyne principle. (8M)
- b) List out the advantages and disadvantages of TRF receiver. (8M)

