Code No: RT22045   **R13**   SET - 1

II B. Tech II Semester Supplementary Examinations, April-2018
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 question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1. a) What are the basic constituents of a communication system? (4M)
   b) How can you obtain a DSB-SC signal? What is the Band-width of DSB-SC signal? (4M)
   c) What do you mean by angle modulation? What are the types of angle modulation? (4M)
   d) Write down the expression for the signal to noise ratio at the output of angle modulation systems. (4M)
   e) Define the term distributor or de-commutator? (2M)
   f) Write the main functions of a radio receiver? (4M)

PART -B

2. a) With suitable diagram explain the square-law diode modulation method for AM generation? (8M)
   b) An amplitude modulated voltage is given by V = 50 (1 + 0.2 cos 100 t + 0.001 cos 3500t) cos 10^6t. State all frequency components present in the voltage, and find modulation index for each modulating voltage term. What is the effective modulation index of V? (8M)

3. a) List out the methods for generation of SSB-SC signal and explain any one of the method in detail. (8M)
   b) Find the various frequency components and their amplitudes in the voltage given by v (t) = 50 (1+ 0.7 Cos 5000t- 0.3 Cos 1000t) sin 5x10^6t. Draw the single sided spectrum. Also evaluate the modulated and sideband power. (8M)

4. a) Explain in detail about NBFM and WBFM. Derive the expression for bandwidth of wideband FM. (8M)
   b) An angle modulated signal is represented in time domain as s (t) = 10 Cos (2π.10^6t + 3 Sin 2π.10^3t). Assuming the given signal as PM, (8M)
   i) Calculate the frequency deviation, modulation index, B.W and power.
   ii) Repeat the above calculations when the message frequency is doubled.

5. a) Derive the expression and explain how pre-emphasis/de-emphasis filtering improves the signal to noise ratio? (8M)
   b) Find Figure of merit and signal to noise ratio for the Ring modulator. (8M)

6. a) With neat sketch explain the generation of PWM and PPM? (8M)
   b) Three signals m_1, m_2 and m_3 are to be multiplexed, m_1 and m_2 have a 50 kHz bandwidth, and m_3 has a 10 KHz bandwidth. Design a commutator switching system so that each signal is sampled at its Nyquist rate. (8M)

7. a) Draw the block diagram of amplitude modulated transmitter and explain functions of various blocks. (8M)
   b) Briefly discuss about the frequency stability in FM Transmitter? (8M)