

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY WAKNAGHAT

T-1 EXAMINATION (SEPTEMBER 2018)

B.Tech 5<sup>th</sup> Sem. (CSE & IT)

COURSE CODE: 10B11EC514

MAX. MARKS: 15

COURSE NAME: Communication Systems

COURSE CREDITS: 4

MAX. TIME: 1 Hrs.

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

- Q 1. Define modulation and discuss in detail the need of modulation in communication. (1+2=3)
- Q 2. An amplitude modulated signal has to be generated. Discuss the functioning of a circuit for the generation of AM signal with neat diagram. (3)
- Q3. How can the double sideband- suppressed carrier (DSB-SC) signal be demodulated using synchronous detector? Discuss the effect of phase and frequency errors in carrier signal of local oscillator on the output. (1+2=3)
- Q4. A message signal  $4 \cos(\pi \times 10^3 t) + 2 \cos(2\pi \times 10^3 t)$  amplitude modulates a carrier signal  $10 \cos(2\pi \times 10^6 t)$ . Then find the bandwidth, sideband powers, efficiency, and total power of AM transmitted signal. (0.5+1+1+0.5=3)
- Q5. Derive an expression for the signal  $V_3(t)$  in figure 1 for  $V_1(t) = 10 \cos(2000 \pi t) + 4 \sin(200 \pi t)$ . Assume that  $V_2(t) = V_1(t) + 0.1 V_1^2(t)$  and that the BPF is an ideal unity gain filter with pass band from 800 Hz to 1200 Hz. (3)

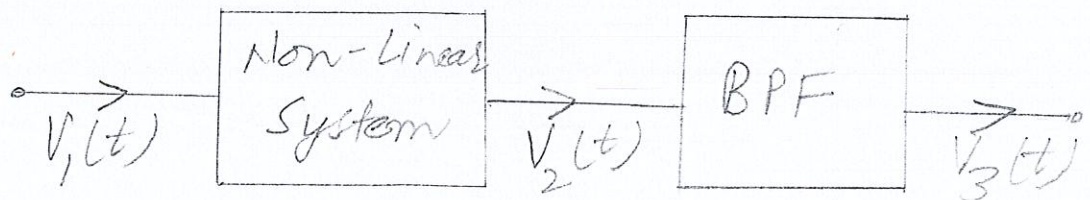


Figure 1.