

**(OLD COURSE)****QP Code : 14439**

(3 Hours)

**[ Total Marks : 100**

- N. B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) Assume suitable data if necessary & state clearly.

1. Answer the following any **four** :- **20**
  - (a) What is the purpose of AFC loop in FM?
  - (b) Explain the use of limiter in FM receiver.
  - (c) Define modulation & discuss its necessity.
  - (d) Explain Noise Triangle in FM.
  - (e) Explain quantization with the help of suitable diagram.
  
2. (a) List different methods of FM generation. Explain the principle of reactance modulator. Why is direct modulation not preferred for FM generation. **10**
- (b) Explain the following with reference to radio receivers. **10**
  - (i) Image frequency
  - (ii) Double conversion
  - (iii) Tracking error
  - (iv) Squelch circuit
  
3. (a) State advantages & disadvantages of SSB over DSB. Explain phase shift method to generate SSB. **10**
- (b) With the help of neat circuit diagram and phasor diagram explain the working of Foster-Seely discriminator. **10**
  
4. (a) What is balanced modulator? Sketch a balanced modulator circuit & explain its working. **10**
- (b) Compare :- **10**
  - (i) AM & FM
  - (ii) FM & PM.
  
5. (a) The output voltage of a transmitter is given by **10**  
 $400 (1 + 0.4 \sin 6280 t) \sin 3.14 \times 10^7 t$ . This voltage is fed to a load of  $600 \Omega$  resistance. Determine.
  - (i) Carrier frequency
  - (ii) Carrier Power
  - (iii) Modulating frequency
  - (iv) Total power output **10**
- (b) Draw the block diagram of pulse code modulation technique and explain each block.

**[ TURN OVER**