Roll No. ..... Total No. of Pages : 2

BT-8/JX 9532

Radar Engineering

Paper : ECE-404E, Option : II

Time : Three Hours] [Maximum Marks : 100

Note :— Attempt any **FIVE** questions selecting at least **ONE** question from each unit.

UNIT—I

1. Explain the basic principles of a radar system. Give the limitations and application of radars. Derive the radar range equation. Explain the factors that affect the maximum range of a radar. 20

2. (a) Define unambiguous range of a radar system and derive an expression for the same. 10

   (b) If the noise figure of a receiver is 2·5 dB, what reduction (measured in dB) occurs in signal-to-noise ratio at the output compared to signal-to-noise ratio at the input. 10

UNIT—II

3. (a) Write short notes on :

   (i) FM-CW Radar

   (ii) Multiple Frequency CW Radar. 5,5

   (b) Explain Non-coherent MTI pulse Doppler Radar. 10

4. (a) Explain the applications and limitations of CW Doppler radar. 10

   (b) Discuss the application of short pulses to radar. How disperse delay lines can be used as pulse compression filters ? 10

UNIT—III

5. Write short notes on :

   (i) Sequential Lobbing

   (ii) Conical beam in detail. 10,10

6. (a) Explain different types of tracking radar systems. Discuss any one in detail with the help of diagram. 10

   (b) Explain amplitude comparison of monopulse tracking radar with the help of a block diagram. 10

UNIT—IV

7. What do you mean by duplexer ? Write also a short note on PPI displays. 20

8. (a) Explain Receiver protectors in detail. 10

   (b) Calculate the minimum receivable signal in a radar receiver which has an IF bandwidth of 1·5 MHz and a noise figure, ·9 dB. 10