Time: 3 Hours **Marks: 80**

NB 1) Question **1 is compulsory**.
   2) Solve **any three questions** from the remaining.
   3) Draw the neat sketches/diagrams **to support your answers**.
   4) Figures on **right hand side** indicate full marks.

Q.1. a) What are the various applications of Radar? **05**
   b) Write the Simple form of Radar Range Equation & State the various factors affecting the predicted range. **05**
   c) Differentiate between Amplitude comparison and Phase comparison methods in monopulse tracking. **05**
   d) Explain amplification process in TWT. **05**

Q.2. a) What do you understand by the terms duty cycle and unambiguous range of a radar? What is the technique employed for resolving range ambiguity? **10**
   b) Draw and explain the block schematic of MTI Radar. **10**

Q.3. a) Explain Doppler shift and its role in Pulsed and CW Radar. **10**
   b) What is blind speed? Derive the equation for Blind speed. How the problem of blind speed can be resolved? **10**

Q.4. a) What is delay-line canceller? Draw and explain its frequency response. **10**
   b) With the help of block diagram, explain Conical scanning used in Radar. **10**

Q.5. a) Write brief about receiver noise. Derive the simplified version of radar range equation in terms of minimum detectable signal to noise ratio $(S/N)_{min}$. **10**
   b) What is the function of duplexer in Radar system? Write about the different types of Duplexer. **10**

Q.6 **Write short note on;**
   a) Threshold detection, false alarming and misdetection. **05**
   b) Discuss about the Radar system losses (Ls). **05**
   c) Operation of Cross Field amplifier. **05**
   d) Types of Radar Displays. **05**

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