

IV B.Tech I Semester Supplementary Examinations, April/May 2005
RADAR ENGINEERING
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Derive the Radar range equation.
(b) With a block diagram explain the operation of pulse radar.
2. By applying Statistical noise theory, derive the Signal to Noise Ratio and hence the expression for probability of detection.
3. (a) What is Doppler effect? What are some of the ways in which it manifests it self? What are its Radar applications?
(b) With a transmit(CW) frequency of 5GHz, calculate the Doppler frequency seen by a stationary Radar when the target radial velocity is 100 km/h(62.5 mph)?
4. (a) Differentiate between coherent and non-coherent MTI Radars.
(b) Explain the function of time domain filter with an example.
5. (a) What is a Box car generator ? What is its role in MTI radar ? Explain.
(b) What is a non coherent MTI ? Distinguish it from coherent MTI.
(c) Explain how the bipolar video signal is converted in to unipolar signal in MTI radar that uses range gates and filters.
6. (a) Compare the tracking techniques.
(b) Explain in detail about limitations to tracking accuracy.
7. (a) Explain the principle of functioning and characteristics of a branch type duplexer.
(b) Explain the characteristics of a mixer unit in radar receivers.
8. (a) Establish the impulse response characteristic for a matched filter.
(b) Derive the radar range expression in terms of jammer bandwidth and power.
