

University of Mumbai
Examination Summer 2022

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester VI

Course Code: ECCDLO 6022 and Course Name: Radar Engineering

Time: 2 hour 30 Minutes

Paper Code 88946

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks. 2 marks each
1.	The radar in which both transmission and reception is done using the same antenna are called:
Option A:	Monostatic radar
Option B:	Bistatic radar
Option C:	Monopole radar
Option D:	Dipole radar
2.	The term radar cross section defines the:
Option A:	Amount of energy scattered by unwanted objects
Option B:	Power radiating ability of the radar
Option C:	Scattering ability of the target
Option D:	Cross section of radar area through which energy is emitted
3.	The minimum Doppler shift is equal to
Option A:	100khz
Option B:	Zero
Option C:	Infinity
Option D:	Transmitter frequency
4.	P_r received by the Radar depends on the effective aperture
Option A:	A_e of target
Option B:	A_e of Receiver
Option C:	A_e of clock pulse
Option D:	A_e of transmitter
5.	MTI radar operating at 5 GHz has a PRF of 800 pps. The lowest blind speed is
Option A:	64 m/sec
Option B:	48 m/sec
Option C:	36 m/sec

Option D:	24 m/sec
6.	Which statement regarding CW Doppler radar is wrong?
Option A:	it does not use duplexer
Option B:	it gives continuous transmission
Option C:	it gives accurate measurement of relative velocity
Option D:	it is capable of measuring target range
7.	A _____ determines the target range by measuring the round trip time of a pulsed microwave signal.
Option A:	Pulse radar
Option B:	Doppler radar
Option C:	Cross section radar
Option D:	None of the mentioned
8.	What are the two basic kinds of cross-field amplifiers (CFAs)?
Option A:	Cross beam and perpendicular beam
Option B:	Injected beam and distributed emission
Option C:	Reticulated beam and focused beam
Option D:	Mad beam and upset beam
9.	The characteristic of the magnetron output pulse that relates to accurate range measurement is its
Option A:	Amplitude
Option B:	Decay time
Option C:	Duration
Option D:	Rise time
10.	Electron-bombarded semiconductor has following technology
Option A:	Vacuum tube
Option B:	Semiconductor
Option C:	Hybrid Vacuum tube –semiconductor
Option D:	Metal semiconductor

Q2 (20 Marks Each)	
A	Solve any Two 5 marks each
i.	Explain PPI.
ii.	Explain Amplification process in TWT.
iii.	Describe radar frequencies and various radar applications.
B	Solve any One 10 mark each
i.	Explain Pulse Doppler Radar with a suitable diagram
ii.	Draw and explain Delay Line Canceller along with its frequency response.

Q3. (20 Marks Each)	
A	Solve any Two 5 marks each
i.	Explain Superheterodyne Receiver.
ii.	Explain Maximum Unambiguous Range. How it is related to PRF.
iii.	Explain the concept of Doppler Shift. How it is implemented in Radars.
B	Solve any One 10 mark each
i.	Compare low power transmitter and high-power transmitter and list the advantages of solid-state RF power source.
ii.	Explain Monopulse tracking in detail.

Q4. (20 Marks Each)	
A	Solve any Two 5 marks each
i.	Explain Frequency Agility and Diversity technique
ii.	Compare CW Radar with Frequency modulated radar
iii.	Explain factors which govern pulse repetition frequency
B	Solve any One 10 mark each
i.	What do you mean by Radar Cross section? Explain RCS of Sphere, Rod and cone
ii.	Draw Block diagram of MTI radar and explain each block in detail