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**B. E. (Seventh Semester) Examination,
April-May 2019**

(New Scheme)

(Et&T Engg. Branch)

RADAR and NAVIGATIONAL AIDS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) of each questions is compulsory. Attempt any two parts from (b), (c) and (d). Draw diagram wherever required.

Unit-I

- 1. (a) What is Accuracy and Resolution concerning the radar system? 2

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- (b) Derive the expression for Radar Range equation how it can be maximized? 7
- (c) Derive an expression to find the probability of false alarm in case of radar, also discuss the false alarm time. 7
- (d) (i) A Long range ground based air surveillance radar has 340 Hz. Pulse repetition rate, 1.5° beam width and antenna rotation rate is 5 rpm. Calculate number of pulses per scan. Comment on obtain value. 5
- (ii) What is radar cross section? 5

Unit-II

- 2. (a) What is Doppler effect? 2
- (b) What is pulse radar? What are the effects of transmitting a long pulse? Explain the all stage of a pulse radar. 7
- (c) Explain delay line canceller. Derive an expression for output response of a MTI receiver with delay line canceller. 7
- (d) Draw the block diagram of sequential lobing tracker radar and explain its operation. 7

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Unit-III

- 3. (a) What is Refraction and Diffraction of radar wave? 2
- (b) Explain how forward scattering from a flat earth surface changes radar performance? 7
- (c) Describe various standard and non standard propagation of radio waves. 7
- (d) Explain attenuation of radar energy by atmospheric gases. 7

Unit-IV

- 4. (a) Define Radome and what is the purpose of using Radome. 2
- (b) What is the phased array antenna? List the salient feature of phased array antenna. 7
- (c) Describe cosecant squared antenna. 7
- (d) Explain parabolic antennas and its different feeds. 7

Unit-V

- 5. (a) What is the function of duplexer? 2
- (b) Explain working of super heterodyne receiver. 7

- (c) Explain the working principle of Magnetron. 7
- (d) Explain A-scope and PPI displays with reference to radar. What are their limitation? 7

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