

**Government College of Engineering, Aurangabad**  
(An Autonomous Institute of Government of Maharashtra)

**B.E. (ECT) REV Examination**  
End semester Examination Nov-Dec 2016

**ET447: Radar & Satellite Communication**

Time: Three Hours

23 NOV 2016

Max. Marks: 60

*“Verify the course code and check whether you have got the correct question paper”*

**N.B.:-**

1. All Questions are compulsory
2. Figures to the right indicates full marks
3. Assume suitable data if necessary and state it clearly
4. Use of non-programmable calculator is allowed

**I Attempt all**

12

- (a) Derive the equation for maximum radar range in terms of radar and target parameters
- (b) What are the components of a pulse radar? Explain how it works..

**II Attempt any two questions**

12

- (a) Discuss about the probability of false alarm.
- (b) Describe the effect of pulse repetition frequency on the estimated unambiguous range of radar
- (c) A 15 GHz Radar has following characteristics:  
Peak transmitted power = 300kW,  
Power gain of antenna = 2700,  
Minimum detectable peak signal power by a receiver =  $10^{-14}$  W,  
Cross sectional area of the Radar antenna =  $10 \text{ m}^2$ .  
If it detects a target of  $4 \text{ m}^2$  cross sectional area, find the maximum range of Radar.

**III Attempt any two questions**

12

- (a) Explain about the Doppler Effect. How to find the target speed from Doppler angular frequency?
- (b) Explain how the Doppler direction is measured using synchronous two phase modulator
- (c) What is the importance of providing isolation between transmitter and receiver? Explain clearly the different method of providing isolation in the case of CW radar

**IV Attempt any two questions**

12

- (a) Compare and contrast the situations with power amplifier and power oscillator in the transmitter of an MTI system.
- (b) A simple MTI delay line canceller is an example of time domain filter. Why? Explain.
- (c) Explain about CDMA in detail with necessary diagrams

**V Attempt any two questions**

12

- (a) Explain about the basic components of Satellite in detail.
- (b) Briefly explain about the features of GIS
- (c) Explain about SPADE System in detail