

Roll No.

24446

**B. Tech 7th Sem. (ECE)
Examination – May, 2018**

RADAR AND SONAR ENGG.

Paper : ECE - 453 - F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*.

1. (a) Make a difference between radar and sonar. 4
- (b) What are the disadvantages of CW radar ? 3
- (c) What do you mean by Doppler Effect ? 3
- (d) Discuss staggered pulse repetition frequencies. 3
- (e) What is Doppler filter bank ? 3
- (f) Write the functions of radar receivers. 4

SECTION – A

2. Draw the block diagram of basic radar set and explain the essentials of its operation. 20
3. (a) Explain the basic principle of a radar system. Give its limitations and applications also. 10
- (b) Write a short note on radar frequencies. 10

SECTION – B

4. (a) Derive the radar range equation. Explain the factors that affect the maximum range of radar. 10
- (b) Write in detail about following terms. 5, 5
- Pulse repetition frequency
- Range ambiguities
5. (a) Draw and explain the block diagram fo frequency modulated continuous wave (FMCW) radar. 12
- (b) With a (CW) transmit frequency of 5 GHz, calculate the Doppler frequency seen by a stationary radar when the target radial velocity is 100 Km/h. 8

SECTION – C

6. (a) Give a complete description of delay line cancelers. 10
- (b) Write a short note on MTI from a moving platform. 10

7. (a) Make a difference between monopulse tracking radar and conical scan tracking radar. 10
- (b) Draw and explain the block diagram of non-coherent MTI radar 10

SECTION - D

8. (a) What do you mean by SONAR system ? Explain it. 10
- (b) What is mixer ? Explain different types of mixers. 10
9. Write short notes on following :
- (a) Radar receiver protectors 7
- (b) Low noise front end 7
- (c) Noise figure 6
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