

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER – 2023**

RADAR AND NAVIGATION

[Maximum Marks : 100]

[Time : 3 hours]

PART – A
(Maximum Marks : 10)

Marks

I. Answer **all** questions in one or two sentences. Each question carries 2 marks.

1. List the factors that affect the maximum range of a radar.
2. Write the expression for Doppler shift in frequency.
3. State the applications of FM-CW radar.
4. State the principle of hyperbolic navigation system.
5. List any two types of landing system.

(5x2=10)

PART – B
(Maximum Marks : 30)

II. Answer any **five** of the following questions. Each question carries 6 marks.

1. State different frequency ranges used in radar.
2. Write short notes on radar performance factors.
3. Explain the working of tracking radar.
4. Describe the four methods of navigation.
5. With the help of diagram explain the working of loop antenna.
6. Explain the working principle of LORAN.
7. Briefly explain inertial navigation system.

(5x6=30)

PART – C

(Maximum Marks : 60)

(Answer **one full** question from each unit. Each full question carries 15 marks)

UNIT – I

- III.** (a) Derive radar range equation. Explain the factors that affect the Maximum range of radar. (9)
(b) Explain the applications of radar system. (6)

OR

- IV.** (a) Draw and explain the block diagram of radar. (9)
(b) Define the term pulse repetition frequency. Explain its significance in avoiding confusions in range calculation. (6)

UNIT – II

- V.** (a) With the help of diagrams explain various types of radar displays. (10)
(b) Draw the block diagram of MTI signal processor. (5)

OR

- VI.** (a) Draw and explain the block diagram of MTI radar. (9)
(b) Describe the operation of pulse Doppler radar. (6)

UNIT –III

- VII.** (a) Draw and explain the block diagram of ground equipment used in VOR. (9)
(b) Explain the principle of operation of Goniometer. (6)

OR

- VIII.** (a) With the help of a block diagram explain the operation of Radio compass ADF. (9)
(b) Draw the block diagram of Distance Measuring Equipment. Explain its operation. (6)

UNIT – IV

- IX.** (a) Briefly explain Microwave Landing System. (9)
(b) Explain Differential GPS navigation system. (6)

OR

- X.** (a) Explain the operation of instrument landing system. (10)
(b) Briefly explain GNSS navigation system. (5)
