MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent institution of MAHE, Manipal)

II SEMESTER, M. TECH (DEFENCE TECHNOLOGY)
END SEMESTER EXAMINATION SEPTEMBER 2022
COURSE: TACTICAL BATTLEFIELD COMMUNICATION AND ELECTRONIC WARFARE (AAE 5283)

Duration: 3 Hrs **Date: 21/09/2022** **MAX. MARKS: 50**

Note:

- *All questions are compulsory*
- *Draw a neat diagram wherever necessary*
- *Stepwise answers carry marks*

Q1A. Name one Directional antenna and one Omnidirectional antenna Name one Directional antenna and one Omnidirectional antenna. **[2]**

Q1B. What are the three processing stages in series involved in ELINT and COMINT i.e. SIGnals INTelligence (SIGINT). **[3]**

Q1C. What is Synthetic Aperture Radar. Briefly describe it's working principle/concept with a suitable diagram of its functioning. **[5]**

Q2A. Name the key component in an IFM receiver and the key component in a crystal video receiver. **[2]**

Q2B. Define Electronic Warfare and it's broad classification according to its objective. **[3]**

Q2C. Discuss technique for measurement of Angle of Arrival by a using a narrow beam antenna with side lobe cancellation. Give at least two advantages and disadvantages of this technique. **[5]**

Q3A. What are the different parameters that contribute to the power received in a communication receiver? Explain with an equation. **[2]**

Q3B. Explain the working of a base line interferometer with the help of a diagram. **[3]**

Q3C. What is Cross-eye jamming. With a suitable diagram explain the technique involved in cross-eye jamming to ensure that the monopulse radar antenna never achieves a null position or tracking solution. **[5]**

Q4A. Name the different regions of the ionosphere. Which is the layer that is absent during the night time? Which of these layers merge together? **[2]**

Q4B. Please bring out the differences between Fourier transform and discrete Fourier transform the form of a table. **[3]**

Q4C. Draw a block diagram and label it to show the major constituents of a EW system. **[5]**

Q5A. Define 'burn though' Range and explain why the power from skin return dominates the jammer power. **[2]**

Q5B. With the help of a diagram explain the term probability of false alarm. **[3]**

Q5C. Please list down the characteristics of a LPI waveform. What are the additional features and algorithms that are required to be incorporated to EW receiver in order that the LPI signal can be correctly classified? **[5]**