

**INDIAN MARITIME UNIVERSITY**  
(A Central University Government of India)  
**END SEMESTER EXAMINATIONS- JUNE 2019**  
**DIPLOMA IN NAUTICAL SCIENCE**  
**SEMESTER - I**

**APPLIED ELECTRICITY & ELECTRONICS (UD11T1103)**

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Date: 26-06-2019

Max. Marks: 70

Time: 02 hours

Pass Marks: 25

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Instructions:

- (i) This question paper consist of two sections.
  - (ii) Answer any three from each section
  - (iii) Question **No. 1 and 5** is compulsory.
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**SECTION – I (ELECTRICITY)**

**Question No. 1 is compulsory**

**(1 × 15 = 15 Marks)**

1. Solve following questions:

- (a) State and explain Ohm's law with its limitations and applications. (5 Marks)
- (b) State and explain Faraday Law of Electromagnetic Induction. (5 Marks)
- (c) A Galvanometer has an internal resistance of  $10\Omega$  and gives a full scale deflection when 40 mA of current passes through it. How this meter can be used to measure a voltage upto 480 volts and current upto 80A. (5 Marks)

2. Solve following questions:

- (a) Explain the series and parallel combination of resistances. Derive an expression for the equivalent resistance, when two resistances are connected parallel in the circuit. (5 Marks)
- (b) What do you mean by inductance? Distinguish between self-inductance and mutual-inductance. (5 Marks)

3. Solve following questions:

- (a) With help of neat sketch, explain in brief how to convert a Galvanometer into Ammeter and Voltmeter. (5 Marks)

- (b) A coil is having 150 turns and is linked with the flux of 0.01wb when carrying current of 10A. Calculate the self-inductance of the coil? If the current in the coil is reversed in 0.01 second, calculate the induced EMF in the coil? (5 Marks)
4. Solve following questions:
- (a) Explain principal, construction and basic working of AC generator. (5 Marks)
- (b) A lamp load of  $1000\Omega$  resistance is connected across the DC supply of 25V. What is power absorbed in lamp and what amount of heat will be released in 10 seconds? (5 Marks)
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**SECTION – II (ELECTRONICS)**

**Question No. 5 is compulsory**

**(1 × 15 = 15 Marks)**

5. Solve following questions:
- (a) Define Modulation and Demodulation used in communication system? What are the different types of modulation? (5 Marks)
- (b) Explain the principal and working of RADAR with the help of a neat labelled diagram. (5 Marks)
- (c) Describe briefly the working of n-p-n CE Transistor Amplifier. (5 Marks)
6. Solve following questions:
- (a) A transistor has  $\beta$  (beta) = 100. Find  $\alpha$  (alpha)? Also calculate emitter current ( $I_E$ ) if base current ( $I_B$ ) is  $20\mu A$ . (5 Marks)
- (b) Explain Yagi-Uda antenna with neat sketch. (5 Marks)
7. Solve following questions:
- (a) A target is moving with a speed of 90kms/hr. A CW radar operating at 4.5 GHz is used to measure the speed. Calculate the Doppler frequency seen by a stationary radar? (5 Marks)
- (b) What do you mean by wave propagation? Describe in brief HF/ Sky wave propagation. (5 Marks)
8. Write short notes on following [Any Two]
- (a) Super-heterodyne radio receiver. (5 Marks)

(b) Explain Logic Gates and name its different types.

(5 Marks)

(c) Electromagnetic Waves.

(5 Marks)