

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)  
**END SEMESTER EXAMINATIONS- JUNE/JULY 2019**  
**B. Sc. (Nautical Science)**  
**Semester-I**  
**Nautical Physics Paper- II**  
**(UG21T2106)**

**TIME: 3 HRS**  
**Date: 05-07-2019**

**MAX. MARKS: 70**  
**PASS MARKS: 35**

**NOTE: Answer any SEVEN questions from the following questions.**  
**All questions carry equal marks. (7X10=70)**

- Q1.a) Differentiate between AC and DC voltages. (5)
- b) The total capacitance of two capacitors is  $0.03\mu\text{F}$ , when joined in series and  $0.16\mu\text{F}$ , when connected in parallel. Find the capacitance of each capacitor. (5)
- Q2.a) What is static electricity? State the precautions against electrostatic hazards. (5)
- b) Derive expressions for equivalent resistance of resistors in series and parallel combinations. (5)
- Q3.a) State and explain Faraday's laws of electromagnetic induction and Lenz's law. (5)
- b) Explain the principle and working of transformer with diagram. (5)
- Q4.a) Explain principle, construction and working of an AC generator with diagram. (5)
- b) Find the magnetic field strength and the magnetomotive force needed to produce a flux density of  $0.33\text{T}$  in an air gap of length  $15\text{mm}$ . (5)
- Q5. Explain the Working of a DC motor. Draw the construction of its types. (10)
- Q6.a) What are the various elements of Earth's magnetic field? Explain in detail. (5)
- b) Explain Ship's magnetism and its components in detail. (5)
- Q7. Write note on any two of the following: (5 x 2 = 10)
- a) Heating effect of current
- b) Electrostatic charge accumulation by Petroleum

c) Magnetic Compass

Q8.a) Differentiate between soft and hard magnetic materials. (5)

b) An 8 pole wave connected dc generator has 1000 armature conductors and flux per pole is 0.035 Wb. At what speed must it be driven to generate 500V? (5)

Q9.a) Explain the thermoelectric effect of current with diagram and state its applications. (5)

b) Write note on circular lifting magnet. (5)