

Indian Maritime University

(A Central University, Govt of India)

May-June 2018 End Semester Examinations

B Sc (Nautical Science)

Semester-II

Nautical Physics-IV (UG21T2206)

Duration:3 Hrs

Max Marks:70 Marks

Date: 27.06.2018

Pass Marks:35 Marks

Note: Answer any SEVEN from the following 9 Questions.

All questions carry equal marks.

(7 × 10 = 70)

1. a) What are the three types of transistor, and explain the 3 modes of operation of transistor. (5)
b) Draw and explain the V-I characteristics of a PN junction. (5)
2. a) Explain how zener diode maintains constant voltage across the load. (5)
b) Derive the relation between α and β of a transistor. (5)
3. a) Explain the working of bridge rectifier with a neat sketch. (5)
b) A transistor is connected in CE configuration in which collector supply is 8V and the voltage drop across resistance R_c connected in the collector circuit is 0.5 V, the value of $R_c = 800\Omega$, $\alpha = 0.96$, determine
a) collector emitter voltage b) base current. (5)
4. Describe LED, LDR and photo diode in detail. (10)
5. a) What is transducer? How does it work? (5)
b) In a certain RC oscillator circuit the value of $R = 220\text{ k}\Omega$ and $C = 250\text{ pF}$. Determine the frequency of oscillations. (5)
6. a) Write short notes on Laser diode (5)

- b) In a CB connection, $\alpha = 0.95$. The voltage drop across $2\text{ k}\Omega$ resistance which is connected is 2 V . Find the base current. (5)
7. a) Explain how thermistor is utilized in finding the temperature coefficient of resistance. (6)
- b) Calculate I_E in a transistor for which $\beta = 50$ and $I_b = 20\mu\text{A}$. (4)
8. Explain the working of RC oscillator in detail. (10)
9. a) Explain the term accuracy and calibration. (4)
- b) Describe the experimental set up of venturimeter for measurement of flow. (6)
