

Indian Maritime University
(A Central University, Govt of India)
B Sc (Nautical Science)
June 2018 End Semester Examinations
Semester-II
UG21T3203 – Nautical Electronics

Duration: 3 Hrs
Date: 09.06.2018

Max Marks: 70 Marks
Pass Marks: 35 Marks

Part A: Compulsory

1. (a) Draw PN-junction diode circuit in forward and reverse biased. (2)
- (b) Show the symbol of NPN and PNP transistors. (2)
- (c) State the principle of negative feedback amplifier. (2)
- (d) Define oscillator circuit. Give example of one oscillator. (2)
- (e) Show the OR and NAND logic gates with logical equations. (2)

Part B:
Attempt any 6 questions from 2 to 9

2. (a) Describe the circuit of half wave rectifier in detail. (5)
- (b) An a.c supply of 230 V is applied to a half wave rectifier circuit through a transformer of turn ratio 10:1. Find (i) the output d.c. voltage and (ii) the peak inverse voltage. Assume ideal diode. (5)
3. (a) What do you meant by transistor biasing. Explain base bias circuit. (5)
- (b) Show the detail circuit of transistor CE amplifier. Explain the function of each component used in the circuit. (5)
4. (a) Explain in detail with circuit diagram the basic principle of LC tank circuit. (5)
- (b) Define α and β of a transistor. In a common base connection $I_c = 0.95\text{mA}$ and $I_b = 0.05\text{mA}$. Find the value of α and β . (5)
5. (a) Define logic gate circuit. Explain OR and XOR logic gates with logical symbol, logical expression and truth table. (5)
- (b) Define a multiplexer circuit. Where they are used. Describe 4:1 multiplexer circuit. (5)
6. (a) Why modulation process is necessary in communication. With the help of waveforms explain Amplitude modulation. (5)
- (b) The maximum peak to peak voltage of an A.M. wave is 16mV and minimum peak to peak voltage is 4mV. Calculate the modulation factor. (5)

7. (a) State the advantages of F.M over A.M. Write an expression of standard F.M voltage wave. (5)
(b) Draw the detailed block diagram of super heterodyne receiver and explain its working. (5)
- 8.(a) With the help of block diagram describe an elements of basic RADAR system. (5)
(b) What are domestic satellite? List at least three Indian domestic satellites. (5)
9. Write a note on any TWO. (5)
a) Full wave bridge rectifier circuit. (5)
b) Timer IC 555 as astable multivibrator. (5)
c) Full adder logic circuit. (5)
d) Basic transistor Flip Flop circuit. (5)
