

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)  
**END SEMESTER EXAMINATIONS-JUNE/JULY 2019**  
**B.Sc (Nautical Science)**  
**Semester-II**  
**Nautical Electronics (UG21T3203)**

**Date: 29.06.2019**  
**Time: 3 Hrs**

**Max.Marks : 70**  
**Pass Marks : 35**

1. a) With respect to a PN junction diode define the following - (2)
  - 1) Breakdown voltage
  - 2) Knee voltage
- b) Explain working of transistor as a switch. (2)
- c) Which class of amplifier operates with lowest Efficiency (2)
  - (i) Class A (ii) Class B (iii) Class C
- d) What is difference between astable & monostable multivibrator (2)
- e) Show NOT and 2 input AND logic gates with truth table (2)

**Part B:**

**Attempt any 6 questions from 2 to 9**

2. a) Describe the circuit of full wave bridge rectifier in detail. (5)
- b) A half wave rectifier is used to supply 50 V d.c.to a resistive load of 800  $\Omega$ . The diode has a resistance of 25  $\Omega$ . Calculate a.c. voltage required. (5)
3. a) Why transistor biasing is required. Explain voltage divider bias circuit (5)
- b) Draw the typical output characteristics of a BJT in CE configuration and clearly show cut-off, active and saturation regions and explain in short action of transistor in above regions (5)
4. a) Draw the circuit diagram of astable multivibrator using timer IC 555 and explain working of the same with waveforms. (5)
- b) For a transistor,  $\beta = 45$  and voltage drop across 1k $\Omega$  which is connected in the collector circuit is 1 volt. Find the base current for common emitter connection. (5)

5. a) Which logic gates are known as universal logic gates & why? (5)  
Draw symbol of universal logic gates and explain operation with truth table
- b) What is multiplexer & describe 4:1 multiplexer circuit. (5)
6. a) What is modulation & demodulation. Draw neat circuit diagram of transistor AM Modulator and explain the working. (5)
- b) An AM wave is represented by the expression: (5)  
$$v = 5 (1 + 0.6 \cos 6280 t) \sin 211 \times 10^4 t \text{ volts}$$
  
(i) What are the minimum and maximum amplitudes of the AM wave?  
(ii) What frequency components are contained in the modulated wave and what is the amplitude of each component?
7. a) Compare AM & FM (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) Zener diode as a voltage regulator (5)
- b) Phase shift oscillator (5)
- c) Half adder logic circuit (5)
- d) Clocked SR Flip Flop circuit with truth table and timing diagram (5)

-----End of question paper-----