

INDIAN MARITIME UNIVERSITY
(A Central University, Govt. of India)
Dec 2019/Jan 2020 End Semester Examinations
B. Sc (Nautical Science)
Semester III
Nautical Electronics Paper –I (UG21T2304)

Date: 12-12-2019

Max.Marks:70

Time:3 Hrs.

Pass Marks:35

Answer any seven of following

- 1.(a) Explain parallel RLC circuit with its phasor diagram. Discuss the condition for parallel resonance. (5)
- (b) A coil of resistance 10 ohms and inductance 0.1 H is connected in series with a condenser of capacitance 150 μ F across a 200 V ,50 Hz supply. Determine
- (i) impedance
 - (ii) current
 - (iii) power factor
 - (iv) voltage across the coil
 - (v) voltage across the condenser. (5)
- 2.(a) Explain the term KW, KVAR & KVA of an AC Circuit & state the relation between them. (5)
- (b) A coil of 15 Ω resistance and 0.3 H inductance is connected in parallel with a variable capacitor across a 230 V, 50Hz supply. Calculate
- (i) the capacitance of the capacitor for resonance
 - (ii) the effective impedance of the circuit and
 - (iii) The current supplied from the mains. (5)
- 3.(a) Why we require modulation in communication system & enlist the types of modulation. (5)
- (b) A frequency modulated wave is given by equation
 $V=10 \cos (9 \times 10^8 t + 5 \sin 1400 t)$ find the carrier frequency, signal Frequency and Modulation Index. (5)
- 4.(a) What is demodulation? Explain the function of an AM diode detector with necessary circuit diagram. (5)
- (b) The carrier and modulating frequencies of an FM transmitter are 130 MHz and 16 kHz respectively. If the maximum frequency deviation is 85kHz, find modulation index, bandwidth, first three upper and lower side band frequencies. (5)

- 5.(a) Explain the Transistor AM Modulator with neat diagram. (5)
- (b) Write down the equation of AM signal voltage & Explain in brief the significance of various components of the equation. (5)
- 6.(a) Write down the difference between Amplitude and frequency modulation. (5)
- (b) Write a short note on balanced slope detector. (5)
- 7.(a) Classify amplifier according to the mode of operation. (5)
- (b) Explain the Class B push pull amplifier. (5)
- 8.(a) Write a short note on RC coupled amplifier. (5)
- (b) What do you understand by Class A, class B and Class C power amplifier. (5)
- 9.(a) Write a Short note on Frequency Modulation. (5)
- (b) State the advantages of F.M over A.M. write an expression of standard F.M voltage wave. (5)