

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
DNS -DIPLOMA IN NAUTICAL SCIENCE:
DEC 2014 / JAN 2015 END SEMESTER EXAMINATION
I SEMESTER
(Up to 2011-12 Batches)

APPLIED ELECTRICITY & ELECTRONICS (T 1103)

Time: 2Hrs
Date :26-12-2014

Max. Marks: 70
Pass Mark : 25

- Note : i) Non – programmable scientific calculator is allowed.
ii) Attempt three questions from each section. Question No. 1 and 5 are compulsory.
iii) In all you have to attempt six questions.

PART -A
ELECTRICITY

- 1.a) With the help of neat diagram explain principle ,construction and basic working of AC generator? A 6 pole AC generator rotates at 1000 rpm. Calculate the frequency of generated emf. (10)
- b) A platinum coil has a resistance of 3.146Ω at 40°C and 3.767Ω at 100°C . Find the resistance at 0°C and the temperature-coefficient of resistance at 40°C . (5)

Answer any two from the following:

2. a) What do you mean by inductance? Distinguish between self inductance and mutual inductance. (5)
- b) Define kirchhoff's laws with example. (5)
3. a) Explain in a brief with a neat sketch the use of a galvanometer as an voltmeter? (5)
- b) A coil of inductance 0.75 H and resistance 40Ω is a part of a series resonant circuit having a resonant frequency of 55 Hz . If the supply is 250 V , 50 Hz . Find (5)
- i) current
- ii) power factor
4. a) Define resistance and state the law of resistance.? (5)
- b). A moving coil instrument has a resistance of 10Ω and gives full scale deflection when carrying 50mA current.Show, how it can be adopted to measure voltage upto 750V and current upto 100A . (5)

PART B
ELECTRONICS

5. a) Define modulation and Demodulation in communication systems. Why do we need modulation. Compare amplitude and frequency modulation. (10)
- b) A piezo-electric crystal has the given parameters: $L=0.15 \text{ H}$, $C= 225 \text{ pF}$, $C_m=770 \text{ pF}$ and $R=7.5\Omega$. find the series and parallel resonant frequencies.

Answer any two from the following:

6. a) Explain the working of a super-heterodyne receiver with necessary block diagram. (5)
b) In common base connection, collector current is 0.95 mA and base current is 0.05 mA.
Find the value of α . (5)
7. a) Explain the working of transistor as an amplifier in common emitter configuration. (5)
b) A sinusoidal carrier voltage of frequency 1300 kHz is amplitude modulated by a (5)
sinusoidal voltage of frequency 15 kHz resulting in maximum and minimum modulated
carrier amplitudes of 100volts and 80volts respectively. Calculate
i. Frequency of lower and upper side bands
ii. Un-modulated carrier amplitude
iii. Modulation index and amplitude of each sideband
8. a) Explain with neat sketch working of transistor as an oscillator. (5)
b) Explain Yagi antenna briefly. (5)
