No. of Printed Pages : 4

BNA-013

00550

B.Sc. (NAUTICAL SCIENCE)

Term-End Examination

June, 2013

BNA-013 : ELECTRICITY AND ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *(i) Non - programmable scientific calculator is allowed.*

*(ii) Attempt **three** questions from each section.*

*(iii) Question **No. 1** and 5 are **compulsory**.*

*(iv) In all you have **10** attempt **six** questions.*

SECTION-A
(Electricity)

1. (a) What do you mean by " Electrical Resistance "? Discuss the connections of resistances with a suitable example. **10**

(b) A wire has a resistance of 120 Ω. It is stretched by 50% of its length. Calculate its new resistance. **5**

Attempt **any two** from the following three questions :

2. (a) Define : **5**

(i) Average value of A.C

(ii) Power factor

(iii) ampere

(iv) emf

(v) temperature coefficient of resistance.

(b) Two coils having 800 and 500 turns are magnetically coupled. When a current of 2.4 amp is flowing in first coil produces a flux of 12mWb in it and 90 percent is linked with second coil. If the current of 2.4 amp is reversed uniformly in 0.2 second, what will be the average emf in each coil ? 5

3. (a) With the help of a neat diagram , explain construction and working of A.C. generator. 5

(b) A capacitor has two parallel plates of 12 cm^2 in area and 0.5 cm apart. When a dielectric slab of area 12cm^2 and thickness 0.5 cm was inserted between the plates , one of the plate has to be shifted by 0.4 cm to achieve the same value of capacitance. What is the dielectric constant of slab ? 5

4. Write short notes on *any two* of the following : **2x5=10**

(a) Connections of Inductances

(b) Uses of Galvanometer

(c) Self inductance and mutual inductance.

SECTION -B

(Electronics)

5. (a) Explain CB amplifier using NPN transistor with necessary circuit diagram. 10

(b) A transistor in common emitter mode has collector supply voltage of 12V and the voltage drop across the 1.2k Ω load resistance is 1.2V. Determine the collector to emitter voltage and the bass current if 'α' is 0.9A. 5

(Attempt *any two* from the following *three* questions)

6. (a) What is frequency modulation ? Give the comparison of frequency modulation and phase modulation. 5

(b) A carrier wave with amplitude of 100V is modulated by a signal of amplitude 40V. What is modulation factor ? What are the amplitudes of lower and upper side band frequencies ? 5

7. (a) Explain the working of a radio transmitter with necessary block diagram. 5

(b) The resonant circuit of a tuned oscillator has a resonant frequency of 2.6MHz. If the value of the inductance is 4mH, determine the value of the capacitance required. 5

8. Write short notes on ***any two*** of the following : 2x5=10

(a) Pressure Transducer

(b) 7 - segment display

(c) RADAR Receiver.
