BNA-013

00835

B.Sc. (NAUTICAL SCIENCE)
Term-End Examination
June, 2015

BNA-013 : ELECTRICITY AND ELECTRONICS

Time : 2 hours   *Maximum Marks : 70*

Note : *Attempt* **three** *questions from each section.*
Questions no. **1** *and* **5** *are* **compulsory.**
Non-programmable scientific calculator is allowed.

SECTION A

(Electricity)

1. (a) Explain Kirchhoff's current and voltage laws with one example.   **10**

    (b) Explain the limitations of Ohm's law.   **5**

2. (a) Define the following terms and also give formula : $4 \times 1\frac{1}{2} = 6$

        (i)   Voltage
        (ii)   Electrical Power
        (iii) Electrical Energy
        (iv)   Power Factor

    (b) Explain the effect of temperature on the resistance of metallic conductor.   **4**

3. (a) Explain Biot-Savart law. *5*

(b) Define capacitance and explain how equivalent capacitance is calculated when two capacitors are connected in parallel. *5*

4. (a) Define time period, frequency, amplitude, average and rms value of A.C. *5*

(b) Calculate the highest speed at which the alternator (A.C. generator) can be operated for

(i) 50 Hz,

(ii) 60 Hz.

Consider number of poles 2. *5*

SECTION B

(Electronics)

5. (a) Explain the working principle of Radar with a neat sketch and also explain how to find range to target. *10*

(b) Draw the block diagram of superheterodyne receiver and explain about it. *5*

6. (a) What are the different types of wave propagation ? Explain any one of them. *2+3=5*

(b) What is Antenna ? Explain Yagi antenna with a neat sketch. *5*

7. (a) How are damped oscillations produced in tank circuit ? *5*

(b) Explain AM diode detector with neat circuit diagram. *5*

8. (a) Write short notes on the following : *5*

(i) 7 segment display

(ii) Light dependent resistor

(b) Draw neat sketches of transistor in

(i) Common emitter configuration

(ii) Common base configuration *5*