| BNA-012 |

00375

B.Sc. (NAUTICAL SCIENCE)

Term-End Examination

June, 2012

BNA-012 : APPLIED SCIENCE

Time : 2 hours *Maximum Marks : 70*

Note : *(i)* *This question paper consists of two sections -*
Section A and Section B. Attempt all questions.

(ii) *Use of non-programmable scientific calculator*
is allowed.

SECTION-A

1. Attempt all parts : 5x1=5

   (a) Kinetic energy of a body is directly
   proportional to the square of its _____.

   (b) Latent heat of vapourization of water is
   _____.

   (c) What is the value of acceleration due to
   gravity on earth's surface ?

   (d) How velocity of sound in air is affected by
   temperature ?

   (e) The loudness and softness of a sound is
   determined by its _____.

2. Attempt *any two* parts :   2x5=10

   (a) Define the wavelength, frequency, time
       period and amplitude of a sound wave ?

   (b) Why do stars appear to twinkle ?

   (c) When 0.15 kg of ice at 0°C is mixed with
       0.30 kg of water at 50°C in a container, the
       resulting temperature is 6.7°C. Calculate
       the latent heat of fusion of ice.

       $(S_{water} = 4186J/kg - K)$

3. Attempt *any two* parts :   2x5=10

   (a) A concave lens has focal length of 15 cm.
       At what distance should object from the lens
       be placed so that it forms an image at 10 cm
       from the lens ?

   (b) Explain law of conservation of linear
       momentum.

   (c) Explain the modes of transfer of heat giving
       example.

4. Attempt *any two* parts :   2x5=10

   (a) Explain doppler effect in detail.

   (b) Define forced oscillation and resonance

   (c) Discuss how acceleration due to gravity
       varies with altitude ?

SECTION-B

5. Attempt *all* parts :   1x5=5

   (a) Electrons are _____ in covalent bond.

   (b) The resistance offered by the liquid to flow is called _____.

   (c) _____ of nitrogen is responsible for acid rain.

   (d) Methane is also known as _____ gas.

   (e) Oxidation and reduction taking place simultaneously is called _____ reaction.

6. Attempt *any two* parts :   2x5=10

   (a) Give three properties and two uses of methane.

   (b) Define

      (i) Exothermic and endothermic reactions.

      (ii) Physical and chemical changes.

   (c) State ideal gas equation and explain the terms used.

7. Attempt *any two* parts :   2x5=10

   (a) Calculate the molecular formula of a compound with vapour density 30 having 40% carbon and 6.67% hydrogen.

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(b) What are the diseases caused due to air pollution and water pollution ?

(c) Define valency. How does it vary across the period and down the group ? Explain.

8. Attempt *any two* parts : $2 \times 5 = 10$

(a) Give electronic configuration of

$$_{11}Na^{23} , _{17}Cl^{35} , _{16}S^{32}$$
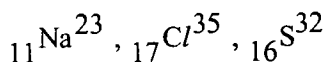
(b) Define : Pollutant and acid rain.

(c) Give I.U.P.A.C names of the following compound.

(i) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

(ii) $CH_3 - CH_2 - CH_2 - COOH$

(iii) $CH_3 - \underset{\underset{OH}{|}}{CH} - \underset{\underset{Cl}{|}}{CH} - CH_3$

(iv) $CH_3 - CH_2 - CH_2 - O - CH_3$

(v) $CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - CH_3$