

B.Sc. (NAUTICAL SCIENCE)

Term-End Examination 00807

June, 2013

BNA-012 : APPLIED SCIENCE

Time : 2 hours

Maximum Marks : 70

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

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

(iii) Attempt all questions.

SECTION-A

1. Attempt all parts : 5x1=5
- (a) What is the unit of gravitational constant ?
- (b) Latent heat of fusion of ice is _____
cal/g.
- (c) Decibel is the unit of _____.
- (d) _____ are shadows formed by
heavenly bodies.
- (e) Give one example of forced oscillation.

2. Attempt *any two* of the following : **2x5=10**
- (a) Calculate the amount of heat required to convert 1.00 kg of ice at -10°C into steam at 100°C at normal pressure.
- Specific heat of ice = 2100J/kg/K , latent heat of fusion of ice = $3.36 \times 10^5\text{J/kg}$, Specific heat capacity of water = 4200J/kg/K and latent heat of vaporisation of water = $2.25 \times 10^6\text{J/kg}$.
- (b) The wavelength of sound emitted by a source is $1.7 \times 10^{-2}\text{m}$. Calculate the frequency of the sound, if its velocity is 340m/s .
- (c) Define moment of inertia and give its physical significance.
3. Attempt *any two* of the following : **2x5=10**
- (a) Cooking is easier in pressure cooker but difficult on hills. Why ?
- (b) Define and give the characteristics of :
- (i) Intensity of sound.
- (ii) Frequency of sound.
- (c) A convex mirror used on an automobile has 3.00m radius of curvature. If a bus is located at 5.00m from this mirror, find the position of the image.

4. Attempt *any two* of the following : **2x5=10**

- (a) Why do we prefer a convex mirror as a rear-view mirror in vehicles ?
- (b) The periodic time of a body executing S.H.M is 2 seconds. After how much interval from $t=0$, will its displacement be half of its amplitude.
- (c) How much above the surface of earth does the acceleration due to gravity reduces by 36% of its value on the surface of earth, Radius of earth = 6400km.

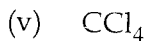
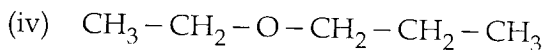
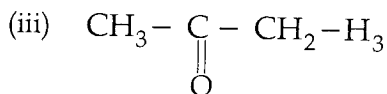
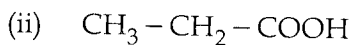
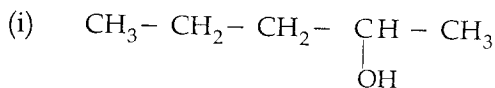
SECTION - B

5. Attempt *all* parts : 1x5=5
- (a) Ionic bond is formed by _____ of electrons.
 - (b) _____ quantum number is represented by letter 'l'.
 - (c) Air pollution affects _____ system of living organisms.
 - (d) C_nH_{2n} is the general formula for _____.
 - (e) _____ is the main source of aliphatic hydrocarbon.
6. Attempt *any two* of the following : 2x5=10
- (a) What are the ill effects of cadmium and lead ?
 - (b) Write chemical equations of the reactions of ethanoic acid with :
 - (i) sodium
 - (ii) ethanol
 - (c) Give the relevance of gas laws to LPG carrier.
7. Attempt *any two* of the following : 2x5=10
- (a) Define :
 - (i) Effervescence
 - (ii) Vapour pressure

- (b) What are the different types of air pollution ?
Explain briefly.
- (c) Compare the physical properties of alcohol and ether.

8. Attempt *any two* of the following : 2x5=10

- (a) Differentiate between :
- (i) Oxidation and reduction
 - (ii) Exothermic and endothermic reaction
- (b) Give the I.U.P.A.C name of the following compound.



- (c) At what temperature will the volume of a gas at 0°C double itself while pressure remaining constant ?
- _____