

**B.Sc. (NAUTICAL SCIENCE)**

**Term-End Examination**

**December, 2012**

**BNA-015 : NAVIGATION-II**

**(BRIDGE EQUIPMENT, WATCH KEEPING  
METEOROLOGY AND OCEANOGRAPHY)**

*Time : 2 hours*

*Maximum Marks : 70*

*Note : All questions carry equal marks. Answer **seven** questions  
in all, **four** from section I and **three** from section II.*

**SECTION - I**

1. (a) Explain the working principle of sextant with suitable sketch. 5  
(b) Describe the horizon or star method to find index error of a sextant and action you will take to remove the error. 5
2. (a) Draw and label the parts of a wet card magnetic compass. 5  
(b) Write short notes on any two w.r.t. gyro : 5
  - (i) Free gyroscope
  - (ii) Rigidity in space
  - (iii) Precession
3. With the help of a simple block diagram, explain the principle and working of the echo sounder. 10

4. Define the following terms : 10
- (a) Vessel constrained by her draft
  - (b) Restricted visibility
  - (c) Seaplane
  - (d) Vessel under way
  - (e) Vessel not under command
5. (a) Explain the duties of an officer of watch while the ship is at anchor. 5
- (b) Write ten points which you will keep in mind when taking over a navigation watch at sea. 5
6. State the shapes and lights shown by the following vessels as day and night signals. Also state sound signals used by them in poor visibility. 10
- (a) Vessel not under command
  - (b) Vessel engaged in dredging operations
  - (c) Pilot vessel making way through water
  - (d) Vessel at anchor (length  $\geq 100\text{m}$ )
  - (e) Vessel constrained by her draft.

## SECTION-II

7. Draw and label the different layers of the Earth's atmosphere and state why the troposphere is important. Explain the term lapse rate and its inversion in the troposphere. 10
8. Differentiate between the following : 10
- (a) Stefan's law and Wien's law.
  - (b) Vapour pressure and Saturated vapour pressure.
9. What is green house effect ? Explain green house gases and global warming. 10
10. With the help of sketch explain the principle, construction, operation and advantages of whirling psychrometer. 10
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