

## DIPLOMA IN NAUTICAL SCIENCE

### Term-End Examination

December, 2007

### BNA-014 : NAVIGATION-I (TERRESTRIAL AND CELESTIAL)

Time : 2 hours

Maximum Marks : 70

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**Note :** All questions are **compulsory**. Use Nories Tables, Burton's Tables and Nautical Almanac, where required. Use Chart BA 813. Non-programmable scientific calculator is allowed.

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#### SECTION I

1. Define any **two** of the following and draw sketches : 5
  - (a) Great Circle
  - (b) Prime Meridian
  - (c) First point of Libra
  
2. A ship started from  $20^{\circ} 12' N$   $072^{\circ} 52' W$  on course  $030^{\circ}$  (T) at 15 knots for 12 hrs. Find the position arrived. 10
  
3. Find the position arrived by a ship when she sailed from  $44^{\circ} 10' N$   $140^{\circ} 10' W$  on course  $210^{\circ}$  (T) for 2200 miles. Use Mercator sailing formula. 10
  
4. On 5<sup>th</sup> March, 1992 in DR position  $32^{\circ} 12' N$   $178^{\circ} 16' E$  the rising sun bore  $099^{\circ}$  (C). If variation was  $4^{\circ}$  E, find deviation of the compass. 5
  
5. On 23<sup>rd</sup> August, 1992 in DR  $34^{\circ} 31' S$   $003^{\circ} 30' W$  find the LHA of Spica at 18h 17m 19s GMT. 5

**SECTION II**

6. (a) Define any **two** of the following : 6
- (i) Natural Scale of a chart
  - (ii) Plan chart
  - (iii) Chart Datum
- (b) Differentiate between 4
- (i) Ocean charts and Coastal charts
  - (ii) Variation and Deviation of compass
7. (a) If true course is  $285^\circ$  (T) and variation is  $7^\circ$  (E), find the compass course by using following deviation table : 3
- | Ship's head     | Deviation        |
|-----------------|------------------|
| $260^\circ$ (C) | $13.0^\circ$ (E) |
| $270^\circ$ (C) | $12.5^\circ$ (E) |
| $280^\circ$ (C) | $11.5^\circ$ (E) |
- (b) Write full form of following abbreviations : 2
- (i) DR
  - (ii) Occ.
  - (iii) Fl.
  - (iv) Wk.
8. Find the true course to steer and engine speed from a position  $06^\circ 30' N$   $079^\circ 30' E$  at 0600 Hrs. in order to reach  $06^\circ 54' N$   $079^\circ 45' E$  at 0900 Hrs. Current is estimated to set  $260^\circ$  (T) at 2 kts. and E'ly wind is estimated to cause a Leeway of  $6^\circ$ . 10

9. At 1100 Hrs. Hindel Nattu Peak (410) & Dondra head Lt. house were in transit and distance from Dondra head Lt. was 14'. From this position vessel steered a course of 068° (T). Current was known to be setting 090° (T) × 3 kts., wind N'ly, Leeway 3°. Find ship's position at 1100 Hrs., course made good, time and distance off when Great Bases Lt. House will be abeam. Ship's speed is 13 kts. 10