

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)

May/June 2017 End Semester Examinations  
B.Sc. (Nautical Science) Third Semester  
(AY 2009 – 2013 batches only)

**Navigation - IV (UG21T1303)**

Date : 10.06.2017

Maximum Marks: 75

Time: 3 Hrs

Pass Marks : 37

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N.B.: (1) Use of non- programmable Scientific Calculator is permitted.

(2) Attempt any five questions.

(3) All questions carry equal marks.

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- 1) Define Coefficient B. Explain the cause and correction of the component of co-eff. B with the help of a diagram. (15 Marks)
- 2) Given values for the coefficients as:-  $A = - 1^\circ$ ,  $B = + 2.5^\circ$ ,  $C = - 3^\circ$ ,  
 $D = + 2^\circ$ ,  $E = - 1^\circ$ .  
Calculate the deviation on courses of  $040^\circ(C)$  and  $300^\circ(C)$ . (15 Marks)
- 3) At position (1) where  $H = 30$  A/m and  $Z = 40$  A/m, Permanent B is  $+8^\circ$  and induced B is  $- 4^\circ$ . Find the deviation due to these coefficients at a position (2) where  $H = 20$  A/m and  $Z = - 30$  A/m, when heading  $255^\circ(C)$ . (15 Marks)
- 4) (a) Draw schematic block diagram of a Marine Radar and label each part. (7 Marks)  
(b) Explain spurious echoes that can effect target detection by Radar. How are they eliminated? (8 Marks)
- 5) With reference to Gyro compass explain following with suitable diagram:- (15 Marks)  
(a) Rigidity in Space  
(b) Precession
- 6) (a) Explain working of Echo-sounder with a block diagram. (10 Marks)  
(b) What are the errors on Echo sounder? How are they eliminated?

(5 Marks)

- 7) (a) Explain the principle of Doppler log and its use as a berthing aid.  
(10 Marks)
- (b) What are the errors of a Doppler log and how are they eliminated?  
(5 Marks)
- 8) Draw a neat diagram to explain different segments and the functioning of GPS.  
(15 Marks)

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