

**INDIAN MARITIME UNIVERSITY**  
 (A Central University, Government of India)  
**End Semester Examination Dec 2019**  
**B.Sc (Nautical Science)**  
**Semester - V**  
**Navigation Paper -V**  
**(UG21T2501)**

Date: 20-12-2019

Maximum Marks: **70**

Time: **3 hrs**

Pass Marks: **35**

Notes:-

1. Use of non-programmable scientific calculator, Nautical Almanac and Noorie's Nautical Table are allowed..
2. BA Chart 5049 or equivalent chart to be provided by exam centre.
3. Tidal graph to be provided by the exam centre.

**TERRESTRIAL NAVIGATION**

**(Questions no 1 is compulsory. Attempt any two of the remaining)**

1. A vessel sails on Great circle from A  $35^{\circ}$  N;  $062^{\circ}$  E to B  $50^{\circ}$  N;  $135^{\circ}$  E. Find the following:
  - i. Initial course
  - ii. Final course
  - iii. GC Distance. (15 Marks)

2. On 12<sup>th</sup> Sept a ship in position  $22^{\circ}12'N$ ;  $076^{\circ}18'W$  , set courses as follows:-

TIME	GYRO CO	GYRO ERROR	WIND	LEEWAY	LOG
1200 on 12 <sup>th</sup>	$134^{\circ}$	$2^{\circ}$ H	NE	$2^{\circ}$	000
1800	$144^{\circ}$	$2^{\circ}$ H	S	$3^{\circ}$	087
2200	$126^{\circ}$	$1^{\circ}$ H	S	$2^{\circ}$	176
0600	$157^{\circ}$	$1^{\circ}$ H	NE	$2^{\circ}$	266
1200 on 13 <sup>th</sup>	$128^{\circ}$	$2^{\circ}$ H	NE	$2^{\circ}$	351

Find the following:-

- a) EP noon 13<sup>th</sup> Sept.
  - b) Course and speed made good between 12<sup>th</sup> and 13<sup>th</sup> Sept noon. (10 Marks)
3. a) Find the course and distance between position  $40^{\circ}18'N$ ;  $100^{\circ}20'W$  to  $67^{\circ}00'N$ ;  $140^{\circ}20'W$  using Mercator sailing. (5 Marks)
  - b) A vessel in North Latitude sailed from Long  $070^{\circ}$  W, on a course of  $040^{\circ}$  T and made a departure of 160M and a DMP of 250. Find the position the position arrived. (5 Marks)
4. A vessel plans a composite track sailing from  $39^{\circ}00'S$   $020^{\circ} 00'E$  to  $40^{\circ}00'S$   $142^{\circ} 00' W$  with limiting Lat. of  $60^{\circ}$  S. Find the Initial course, final course and the distance along the composite track (10 Marks)

## **VOYAGE PLANNING**

**(Questions no 5 is compulsory. Attempt any two of the remaining)**

5. a) Describe following publications used in Passage Planning.(2x7.5=15 marks)
- i) Ocean Passages of the World.
  - ii) Admiralty List of Lights and Fog Signals.
  - iii) Admiralty Weekly Notice to Mariners.
- b) Find the Standard Time during afternoon of 17<sup>th</sup> Sept. at Vancouver when there will be 6.5 mtrs of water over a shoal patch where the chart shows 3.5 mtrs sounding. Extract from ATT given below:-

	TIME	HEIGHT
17 <sup>TH</sup> Sept.	0024	2.4
	0542	6.2
	1223	1.5
	1832	7.0

6. a) At 2200hrs., Ile de Batz Lt. bore 199° T and Les Sept. Iles Lt. bore 124° T. Find the ship's position. From this position find course to steer to pass Les Hanois Lt. 10' when abeam on the stbd. side.
- b) Find the course and speed made good if ship experienced a current setting 021° T at 3 knots. (Ships engine speed 12 knots). (2X5= 10 Marks)
7. From a ship at anchor, following compass bearings were observer:
- |                       |        |
|-----------------------|--------|
| Needles Lt.Ho.        | 329° C |
| St. Catherine Pt. Lt. | 001°   |
| Nab Tower             | 041°   |

Find the following:-

- a) Position of the Ship
  - b) Deviation for the ship's head, if variation was 2° E. (10 Marks)
8. a) At 0800hrs, Casquet Lt bore 200° T and Alderney Lt bore 149° T. Find the ship's position.
- b) From this position find the course to steer counteracting current setting 245° T at 3 knots to pass Pte. de Barfleur bearing 180° at distance of 10'. (Ships engine speed 10 knots) (2X5=10 Marks)

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