

# Unit 14 - Week 12: Hydrographic Survey & Navigation

## Course outline

How does an NPTEL online course work?

Week 0: Prerequisite

Week 1: Introduction to Higher Surveying and Coordinate System & Reference Frame

Week 2: Coordinate System and Reference Frame & Time and Astronomy

Week 3: Time and Astronomy & Error, Accuracy, and Adjustments Computations

Week 4: Error, Accuracy, and Adjustments Computations

Week 5: Error, Accuracy, and Adjustments Computations, GPS & Photogrammetry

Week 6: Photogrammetry

Week 7: Photogrammetry

Week 8: Photogrammetry & LIDAR (LIDARgrammetry)

Week 9: RADAR (RADARgrammetry)

Week 10: RADAR (RADARgrammetry)

Week 11: RADAR (RADARgrammetry) & Hydrographic Survey

Week 12: Hydrographic Survey & Navigation

Lec 1: Modern techniques for hydrographic Survey

Lec 2: Navigation

Lec 3: Conclusive lecture

Quiz : Assignment 12

Weekly feedback form for week 12

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## Assignment 12

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

**Due on 2020-04-22, 23:59 IST.**

1) Consider following two statements about the pulse length of an echo sounder Statement 1: Large will be the pulse length, larger will be the energy return. Statement 2: To distinguish two objects in a bathymetry survey, distance between them should be greater than the half of the pulse length. **1 point**

- a. Statement 1 is true and statement 2 is false
- b. Both statement 1 and statement 2 are true
- c. Statement 1 is false and statement 2 is true
- d. Both statement 1 and statement 2 are false

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Both statement 1 and statement 2 are true

2) Find the depth, depth bias and the range resolution bias of a single beam echo sounder if it is tilted by an angle of 10° vertically. (Assume slant range = 100m, round off your answer to 3 decimals) **1 point**

- a. 98.5 m, 1.5m, 15.23 cm
- b. 98.5 m, 15m, 15.23 cm
- c. 98.5 m, 1.5 m, 1.523 m
- d. 98.5 cm, 15m, 15.23 cm

No, the answer is incorrect. Score: 0

Accepted Answers:  
c. 98.5 m, 1.5 m, 1.523 m

3) Find the swath covered and percentage of area covered by an echo sounder of beam width 30° which is used to survey an area of 1200 m x 1200 m. (Assume depth = 120 m) **1 point**

- a. 895.69 m, 74.64
- b. 895.69 cm, 74.64
- c. 895.69 m, 0.7464
- d. 895.69 km, 74.64

No, the answer is incorrect. Score: 0

Accepted Answers:  
a. 895.69 m, 74.64

4) Find the critical angle of refraction and the refraction cone at vertex if the refractive index of air is 1 and the refractive index of water is 1.42? **1 point**

- a. 44.77°, 89.54°
- b. 44.78°, 89.56°
- c. 44.79°, 89.58°
- d. 44.77°, 90.54°

No, the answer is incorrect. Score: 0

Accepted Answers:  
a. 44.77°, 89.54°

5) Consider the following and choose the correct option: Statement 1: Low frequency acoustic waves are effective for deep water survey, because the wave (Intensity) attenuation is lower. Statement 2: Small size transducers emit low frequency acoustic waves **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Statement 1 is true, statement 2 is false

6) Consider the following and choose the correct option: Statement 1: Acoustic waves are sound waves, whose travelling speed in water depends upon pressure, density and salinity of water. Statement 2: Hydrophone and transducers are components of echosounder that transmits and receives acoustic signals, respectively. **1 point**

- a. Statement 1 is true and statement 2 is false
- b. Both statement 1 and statement 2 are true
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are false

No, the answer is incorrect. Score: 0

Accepted Answers:  
a. Statement 1 is true and statement 2 is false

7) Consider the following and choose the correct option: Statement 1: Tapping a table top and creating sound is equivalent of creating a sound pulse. Statement 2: Sound is wave that show all behavior like a light wave. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Statement 1 is true, statement 2 is false

8) Consider the following and choose the correct option: Statement 1: The maximum error to resolve distance can be equal to pulse length. Statement 2: Increasing pulse wavelength will improve the resolution. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
a. Both statement 1 and statement 2 are false

9) Consider the following and choose the correct option: Statement 1: Directing a person on a road so that he/ she can reach to his/her destination is an example of navigation. Statement 2: Two persons are sitting on a motorbike and the person sitting on the rear seat is using a GPS and giving instructions to driver, who is seating on the front seat of motorbike, is an example of navigation. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
c. Statement 1 is false, statement 2 is true

10) Consider the following and choose the correct option: Statement 1: A driving coach, sitting with a person in a car, guiding the person on how to drive a certain length of road path, is an example of navigation. Statement 2: A driver who daily drives the bus, between two fixed points (e.g. driver who drives the bus to carry passenger from terminal to aircraft) is an example of navigation. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Statement 1 is true, statement 2 is false

11) Consider the following and choose the correct option: Statement 1: Missile is said to navigate because it starts from a known point to known destination point through a certain path between two points. If missile hits a wrong target, it is not considered as navigation. Statement 2: Bus is said to navigate from point (A) or bus stop to another city's bus stop because it moves on a road and can change in position on road. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
a. Both statement 1 and statement 2 are false

12) Consider the following and choose the correct option: Statement 1: In Rho-Rho navigation, minimum two transmitters are required because planimetric position (x,y) can only be determined intersection of two range circles. Statement 2: In hyperbolic navigation, minimum 4 transmitters stations are required because 4 transmitters give three lines of positions (LOP) and intersection of three LOPs give equations of hyperbola. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Statement 1 is true, statement 2 is false

13) Consider the following and choose the correct option: Statement 1: Compared to topographic maps, a navigation map used by mobile application to support road navigation in urban environment has special features like road traffic signal information, turnings, one way or two way. Statement 2: Navigation mobile application also provides a facility for shortest path (or likely to be shortest) between two points queried by user. However, if GPS does not work, then a user moving between two points will not be navigation. **1 point**

- a. Both statement 1 and statement 2 are false
- b. Statement 1 is true, statement 2 is false
- c. Statement 1 is false, statement 2 is true
- d. Both statement 1 and statement are true

No, the answer is incorrect. Score: 0

Accepted Answers:  
b. Statement 1 is true, statement 2 is false