Unit 13 - Week 11: RADAR (RADARgrammetry) & Hydrographic Survey

Course outline

Assignment 11

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

Due on 2020-04-15, 23:59 IST.

1) Find error in the target height and across track position, when it is mapped using SAR satellite of range 13 km, angle of incidence is 45°, and error in the incidence angle is 0.05°? ***1 point***

a. 8.022 m, 8.022 m
b. 8.022 m, 8.012 m
c. 8.032 m, 8.013 m
d. 8.013 m, 8.022 m

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. 8.022 m, 8.022 m

2) What will be the phase corrected for the curved Earth for an interferometric survey with a baseline of 10m and look angle of 40° and horizontal base line angle of 10° and change in look angle is 0.2° using a radar of wavelength 10cm. ***1 point***

a. -3.798 cm
b. -3.788 cm
c. -3.786 cm
d. -3.795 cm

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. -3.798 cm

3) While doing change mapping, find the phase change given that the baseline parallel to the look direction is 6m using an SAR of look angle 40° and horizontal base line angle is 10°? (Assume range of SAR as 10 km) ***1 point***

a. -6 m
b. -6.006 m
c. -6.02 m
d. -6.12 m

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. -6 m

4) Find the orientation of SAR with respect to the other SAR if they are involved in the interferometric process of single pass type with ranges 4 km and 5 km, baseline of 1 km? (both are having an incident angle of 40°) ***1 point***

a. 3.13°
b. 5°
c. 7.1°
d. 7.2°

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. 3.13°

5) Consider the following and choose the correct option: Statement 1: For RADAR, slant range and ground range follows the trajectory of hyperbolic for a given flying height of RADAR sensor. Statement 2: Increasing depression angle will increase ground range for a point on a terrain. ***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:
a. Statement 1 is true and statement 2 is false

6) Consider the following and choose the correct option: Statement 1: Foreshortening occurs due to elevation of a terrain surface and its interaction with incident pulse. Statement 2: Incase if the normal of a terrain surface and incident pulse has a direction difference of 90°, there will be no foreshortening. ***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

7) Consider the following and choose the correct option: Statement 1: Layover is equal to negative for foreshortening because in layover image points of bottom appears later than top points along the look direction. Statement 2: For a given terrain on feature slope, layover is higher as the point on terrain is away from nadir of sensor. ***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:
d. Both statement 1 and statement 2 are false

8) Consider the following and choose the correct option: Statement 1: Shadow length is proportional to the flying height of platform because as flying height increase for a given terrain, projection of elevated point on datum will be less. Statement 2: Shadow can be explained as common phenomenon for RADAR, LiDAR and perspective geometry of optical imaging system because shadow defines the area of no data due to occlusion. ***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:
c. Statement 1 is false and statement 2 is true

9) Consider the following and choose the correct option: Statement 1: RADAR shadow length can be different for a same point for two different position of RADAR sensor and incidence angle of pulse. Statement 2: Shadow length for RADAR sensor is proportional to both terrain height and depression angle. ***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:
a. Statement 1 is true and statement 2 is false

10) Consider the following and choose the correct option: Statement 1: If Rayleigh criterion, Peake, and Oliver criterion are combined for a terrain surface at nadir, of RADAR sensor, the smooth surface should have terrain height variation between λ/2S and λ/8 , where λ is wavelength of RADAR signal. Statement 2: Rayleigh criterion provides a conservative estimate of surface roughness for harder surface than Peake and Oliver criterion. If a surface is defined rough by, Peake and Oliver may not be rough according to Rayleigh criterion. ***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:
a. Statement 1 is true and statement 2 is false

11) Consider the following and choose the correct option: Statement 1: Two high tides and two low tides occur at every point on Earth surface during every lunar day ($24^h 50^m$).
Statement 2: High tide is experienced at a place which is nearest to Moon and low tide occurs at the same time on a location of Earth that is exactly opposite to location of high tide. ***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:
a. Statement 1 is true and statement 2 is false

12) Consider the following and choose the correct option: Statement 1: When Sun and Earth, and Moon are in a line, Sun's gravity force on Earth and Moon's gravity force counteract against each other, and Earth experiences low tides. Statement 2: When Sun and Moon subtend an angle of 90° on Earth, their gravity forces work at 90° to each other and resultant force is much higher than individual's gravity force on Earth. This creates high tides. ***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:
d. Both statement 1 and statement 2 are false

13) Consider the following and choose the correct option: Statement 1: Using hydrographic data, one can find out locations of rocks, sand bars, and navigation lights. Statement 2: Using hydrographic data, it is possible to measure quantity and flow of water to understand the flood and flood control. ***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

14) Consider the following and choose the correct option: Statement 1: Tide corrections is depth of water between bottom of vessel (ship) and reference mark of datum. Statement 2: Sound velocity correction in observed depth measure the depth from sea surface to bottom of sea. ***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:
d. Both statement 1 and statement 2 are false

15) Consider the following and choose the correct option: Statement 1: Higher frequency of SONAR penetrates to greater depth compared to sounder of lower frequency. Statement 2: Large wavelength of an echo sounder provides higher resolution and better definition of submerged structures. ***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:
d. Both statement 1 and statement 2 are false

16) Consider the following and choose the correct option: Statement 1: In Neap tide, the tide level is lower than the average tide because the Sun and Moon subtend 90° angle and their tractive forces on Earth results in lower resultant force. Statement 2: Neap tide is though a tide, which is lower than average tide, is lowest of highest tides. ***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

17) Consider the following and choose the correct option: Statement 1: If Moon slows down, it will reduce the height of tides on Earth surface. Statement 2: If Moon slows down, the frequency of high and low tides will reduce. ***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

18) Consider the following and choose the correct option: Statement 1: Priming and lagging are terms that explains the intermediate tides between lowest and highest tides as Moon moves from Full Moon (or New Moon) to quadrature position. Statement 2: The effect of Moon on tides on Earth is more than twice of that of Sun. ***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

19) If the mass of Moon becomes twice of its present mass, then ratio of tractive force of Sun to that of Moon will increase to______. ***1 point***

a. 0.32
b. 0.23
c. 0.43
d. 0.34

No, the answer is incorrect.
Score: 0
Accepted Answers:
b. 0.23

20) Consider the following and choose the correct option: Statement 1: Line spacing is the difference of range lines that are drawn parallel to share line. Statement 2: In order to verify the quality of hydrographic survey, sounding on depth measurements is again performed on lines parallel to range lines. ***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:
d. Both statement 1 and statement 2 are false

21) Consider the following and choose the correct option: Statement 1: Wire drag survey determines the obstacles or elevated points in sea bed by observing the distortion in straight trajectory of wire stretched between two strips. Statement 2: In wire drag survey, under water obstacle or elevated point disturbs the geometric arrangement between sinkers of buoys placed on sea surface and horizontal connection between sinkers. Thus this disturbances is used to identify both location and depth of a obstacle. ***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

22) Consider the following and choose the correct option: Statement 1: It is determined that all systematic error should be minimized but random errors can be present. Statement 2: In the presence of systematic errors, the error is reported as RMSE which is equal to square root of sum squares of systematic and random errors. ***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

23) Consider the following and choose the correct option: Statement 1: Parallel line method of horizontal positioning should preferably be used on a day when water is expected to be calm. Statement 2: Parallel lines method of horizontal positioning is useful only near parts upto a limited distance of 200 m for the purpose of minor excavation and ensuring fishing facility at a plant. ***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

24) Consider the following and choose the correct option: For locating a horizontal position in hydrographic survey by measuring distance (range) of a boat along a range line from a reference mark, read the following statements and answer accordingly. Statement 1:Time measurement, boat speed measurement and angle measurements are required for determining horizontal position for sounding location. Statement 2: The method is a combination of intersection and resection, because distance is measured by surveyor in boat at unknown locations. ***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:
a. Statement 1 is true and statement 2 is false

25) A horizontal position of a sounding location is to be determined. Two reference points on sphere are fixed. Range line is passing through one point. Angle between range line and line joining boat and another reference points are measured from boat. If boat is moving at a constant speed of 3.6 km/hr, calculate the time interval between sounding locations at distance of 10 m. ***1 point***

a. 20 sec
b. 15 sec
c. 10 sec
d. 5 sec

No, the answer is incorrect.
Score: 0
Accepted Answers:
c. 10 sec

26) Regarding method of horizontal position in hydrographic survey, in which both an angle and distance are measured from boat to two known fixed points, consider following two statements and choose the correct option. Statement 1: Method is less accurate because it involves measurement of angle and time at regular interval are performed manually that gives high chances of error if spacing of points along are less. Statement 2: Method is time taking as vessel or boat has to move at very low speed in calm conditions to facilitate surveyors in boat for accurate measurement. ***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

27) In intersection method, where two angles to vessel/boat are measured from two distinct but known control stations onshore, consider following two statements and choose correct options: Statement 1: Method is highly accurate because measurements are performed from static positions at control stations. Statement 2: Method is not accurate because angles are measured to a very slow moving boat/ vessel. ***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:
a. Statement 1 is true and statement 2 is false

28) Consider the following and choose the correct option: Statement 1: Ray method is preferred over Parallel Line method for horizontal positioning for hydrographic survey where beach is parallel to coast line and usable space is available on beach. Statement 2: Both Ray method and Parallel Line methods are recommended for short distance (200-300 m) if water is preferably calm because both methods are controlled with manual efforts. ***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:
c. Statement 1 is false and statement 2 is true