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SEAT No. _____

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SARDAR PATEL UNIVERSITY

S.Y.B.Sc. Examination, FOURTH Semester

Wednesday, 10TH April 2019

Time : 10.00 am To 12.00 noon

Physics Elective Course Code : US04EPHY02

Course Title : Advanced Geophysics and Remote Sensing

Total Marks : 70

Q-1 Write answers to the following multiple choice questions in your answer book by [10] selecting the proper option.

- (1) The difference between g_{obs} and g_{base} is called _____ anomaly.
(a) Bouguer (b) Wegner (c) Newton (d) Einstein
- (2) A plot of the gravitational acceleration versus location is known as gravity _____.
(a) profile (b) curve (c) plot (d) trace
- (3) The standard gravimeter has a precision of approximately _____ $\times 10^{-3}$ cm/s^2 .
(a) 0.1 (b) 0.01 (c) 0.001 (d) 0.0001
- (4) The minimum number of boreholes required in cross-hole survey is _____.
(a) 1 (b) 2 (c) 3 (d) 4
- (5) The body waves follow _____ paths.
(a) circular (b) parabolic (c) curved (d) ray
- (6) The error produced due to path radiance is called _____ error.
(a) path (b) radiometric (c) geometric (d) concentric
- (7) The height of the crest from the mid-point is called
(a) wavefront (b) wavelength (c) amplitude (d) frequency
- (8) The number of wave crests passing through a fixed point in one second is called
(a) wavefront (b) wavelength (c) amplitude (d) frequency
- (9) Radiance describes the _____ distribution of radiation emitted from a surface.
(a) linear (b) angular (c) non-linear (d) exponential
- (10) 1 rad = _____^o
(a) 57.3^o (b) 75.3^o (c) 5.73^o (d) 7.53^o

Q-2 Answer the following questions in brief. (Answer any Ten Questions)

[20]

- (1) Write a short note on instrument drift.
- (2) Write a short note on gravitational acceleration.
- (3) Enlist the factors affecting the gravity survey.
- (4) Write a short note on L waves.
- (5) Explain in brief about seismic methods.
- (6) Write a short note on Rayleigh waves
- (7) Define active and passive remote sensing.
- (8) Write a short note on digital techniques of data analysis.

(PTO)

- (9) Define spectral bands.
- (10) What are perigee and apogee?
- (11) Define solid angle and steradian.
- (12) Enlist the different radiometric quantities.

- Q-3 (a) Explain the effect of latitude and the elevation on the gravity survey. [5]
 (b) Explain about gravity data reduction and hence define Bouguer anomaly. [5]

OR

- Q-3 (a) Write a note on gravity survey. [5]
 (b) Explain how gravitational acceleration 'g' is related to geology. [5]

- Q-4 (a) Write a note on reflection of seismic waves. [5]
 (b) Obtain the formula for the velocities of P and S waves inside the earth and compare them. [5]

OR

- Q-4 What are seismic waves? Discuss the different types of seismic waves in detail. [10]

- Q-5 (a) Discuss the role of sun and atmosphere in remote sensing. [5]
 (b) Derive the equation for the velocity of electromagnetic radiation. [5]

OR

- Q-5 (a) Discuss the different stages of remote sensing in detail. [5]
 (b) Explain the multi-spectral concept of remote sensing. [5]

- Q-6 (a) State Kepler's laws of planetary motion and explain them with the help of schematic diagrams. [5]
 (b) Write a note on different types of orbits of remote sensing satellites. [5]

OR

- Q-6 (a) Write a note on geosynchronous and geostationary orbits of remote sensing satellites. [5]
 (b) Discuss the concept of solid angle in detail and hence describe the measurement geometry of remote sensing system. [5]

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