

**SARDAR PATEL UNIVERSITY**  
**S.Y.B.Sc. Examination, FORUTH Semester**  
**Monday, 11<sup>TH</sup> April 2016**  
**Time : 10.30 am To 12.30 pm**  
**Instrumentation Course Code : USO4EPHY02**  
**Course Title : Advanced Geophysics and Remote Sensing**

**Total Marks : 70**

**Q-1 Write answers to the following multiple choice questions in your [10] answer book by 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) 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
- (3) A plot of the gravitational acceleration versus location is known as gravity \_\_\_\_.  
 (a) profile (b) curve (c) plot (d) trace
- (4) The waves of energy that travel through the earth when an earthquake takes place are known as \_\_\_\_ waves.  
 (a) earth (b) seismic (c) ground (d) underground
- (5) The velocity of p-waves is always \_\_\_\_ that of s-waves.  
 (a) greater or equal to (b) less or equal to (c) less than (d) greater than
- (6) The capability of the sensor to discriminate two targets based on its reflectance is called \_\_\_\_ resolution.  
 (a) spatial (b) spectral (c) radiometric (d) temporal
- (7) The number of wave crests passing through a fixed point in one second is called \_\_\_\_.  
 (a) wavefront (b) wavelength (c) amplitude (d) frequency
- (8) The sensors which carry electromagnetic radiations of a specific wavelength or a band of wavelengths to illuminate earth's surface are called \_\_\_\_ sensors.  
 (a) electromagnetic (b) radiation (c) active (d) passive
- (9) The total solid angle subtended by the surface of sphere at the centre is  
 (a)  $\pi$  (b)  $2\pi$  (c)  $4\pi$  (d)  $8\pi$
- (10) When eccentricity of the orbit  $e = 0$ , the shape of the orbit will be  
 (a) parabola (b) hyperbola (c) ellipse (d) circle

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

**[20]**

- (1) State the Newton's universal law of gravitation.
- (2) Write a short note on gravitational acceleration.
- (3) Enlist the factors affecting the gravity survey.
- (4) Write a short note on seismic waves.
- (5) Write a short note on L waves.
- (6) Explain in brief about seismic methods.
- (7) Enlist the first four stages of remote sensing system.
- (8) Define active and passive remote sensing.

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- (9) Write a short note on platforms.
- (10) Define a plane angle in terms of radians.
- (11) Write a short note on irradiance.
- (12) Explain how a radian is related to a degree.
- Q-3 (a) Provide a detailed account of Magnetic Survey. [5]  
 (b) Explain the effect of latitude and the elevation on the gravity survey. [5]
- OR**
- Q-3 (a) Explain about gravity data reduction and hence define Bouguer anomaly. [5]  
 (b) Explain how gravitational acceleration 'g' is related to geology. [5]
- Q-4 (a) Write notes on seismic refraction and seismic reflection. [5]  
 (b) Discuss in detail about borehole seismic survey. [5]
- OR**
- Q-4 What are seismic waves? Discuss the different types of seismic waves in detail. [10]
- Q-5 (a) What are remote sensors? Discuss the different types of resolutions provided by them. [5]  
 (b) Derive the formula for the velocity of electromagnetic radiation. [5]
- OR**
- Q-5 (a) Explain the multi-spectral concept of remote sensing. [5]  
 (b) Discuss the role of sun and atmosphere in 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 Radiant Flux and Irradiance. [5]
- OR**
- Q-6 (a) Discuss about Radiant Energy and Radiant Intensity in detail. [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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