GATE

Geology and Geophysics

Engineering

Previous Year Paper

2010

GG : GEOLOGY AND GEOPHYSICS

Duration : Three Hours *Maximum Marks* :100

Read the following instructions carefully.

1. This question paper contains **24** pages including blank pages for rough work. Please check all pages and report discrepancy, if any.

2. Write your registration number, your name and name of the examination centre at the specified locations on the right half of the **Optical Response Sheet (ORS)**.

3. Using **HB** pencil, darken the appropriate bubble under each digit of your registration number and the letters corresponding to your paper code.

4. All questions in this paper are of objective type.

5. Questions must be answered on the **ORS** by darkening the appropriate bubble (marked A, B, C, D) using HB pencil against the question number on the left hand side of the ORS. **For each question darken the bubble of the correct answer.** In case you wish to change an answer, erase the old answer completely. More than one answer bubbled against a question will be treated as an incorrect response.

6. There are a total of 65 questions carrying 100 marks.

7. Apart from General Aptitude (GA), the question paper consists of two parts: Part A and Part B. Part A is common to both Geology and Geophysics candidates. Part B contains two sections: Section 1 (Geology) and Section 2 (Geophysics). Geology candidates will attempt questions in Section 1 only. Geophysics candidates will attempt questions in Section 2 only. Correctly darken the bubble (in the ORS) corresponding to the section attempted by you.

8. Part A consists of 25 questions; all will carry 1-mark each. Each of the sections (Section 1 & Section 2) in Part B consists of 30 questions; all will carry 2-marks each.

9. Questions Q.48 – Q.51 (2 pairs) are common data questions and question pairs (Q.52, Q.53) and (Q.54, Q.55) are linked answer questions. The answer to the second question of the linked answer questions pair depends on the answer to the first question of the pair. If the first question in the linked pair is wrongly answered or is un-attempted, then the answer to the second question in the pair will not be evaluated.

10. Questions Q.56 – Q.65 belong to General Aptitude (GA). Questions Q.56 – Q.60 will carry 1-mark each, and questions Q.61 – Q.65 will carry 2-marks each. The GA questions will begin on a fresh page starting from page 15.

11. Un-attempted questions will carry zero marks.

12. Wrong answers will carry NEGATIVE marks. For Q.1 – Q.25 and Q.56 – Q.60, ⅓ mark will be deducted for each wrong answer. For Q.26 – Q.51 and Q.61 – Q.65, ⅔ mark will be deducted for each wrong answer. The question pairs (Q.52, Q.53), and (Q.54, Q.55) are questions with linked answers. There will be negative marks only for wrong answer to the first question of the linked answer question pair i.e. for Q.52 and Q.54, ⅔ mark will be deducted for each wrong answer. There is no negative marking for Q.53 and Q.55.

13. Calculator (without data connectivity) is allowed in the examination hall.

14. Charts, graph sheets or tables are NOT allowed in the examination hall.

15. Rough work can be done on the question paper itself. Additionally, blank pages are provided at the end of the question paper for rough work.

PART A: COMMON TO BOTH GEOLOGY AND GEOPHYSICS CANDIDATES

Q.1 – Q.25 carry one mark each.

Q.1 Earth's dipole field originates mainly from

(A) mantle (B) outer core (C) inner core (D) crust

Q.2 Sunspots are regions of

(A) high pressure
(B) low magnetic field
(C) high temperature
(D) high magnetic field

Q.3 The electrical conduction mechanism in sedimentary rocks is usually

(A) pyroelectric (B) electronic (C) electrolytic (D) dielectric

Q.4 The unit of electrical resistivity is

(A) Ohm (B) Ohm-m (C) Ohm-m^2 (D) Ohm-m^{-1}

Q.5 Outcrop pattern parallel to topographic contours signifies

(A) horizontal beds
(B) vertical beds
(C) inclined beds
(D) folded beds

Q.6 A rock with equal modal contents of quartz, plagioclase and orthoclase is known as

(A) diorite (B) gabbro (C) granite (D) syenite

Q.7 The main factors in soil-forming processes are

(A) bedrock and time only
(B) topography and bedrock only
(C) climate, time and topography only
(D) climate, topography, bedrock and time

Q.8 Glacial drift refers to the

(A) movement of glaciers
(B) interglacial intervals
(C) erosional landforms produced by glaciers
(D) sediments deposited by glaciers

Q.9 Sand dunes are long ridges whose alignment is

(A) always parallel to the prevailing wind direction
(B) always perpendicular to the prevailing wind direction
(C) either parallel or perpendicular to the prevailing wind direction
(D) not related to the prevailing wind direction

Q.10 The oldest rocks in India are

(A) more than 3 billion years old
(B) between 2.5 and 3 billion years old
(C) between 2 and 2.5 billion years old
(D) less than 2 billion years old

Q.11 The sequential placement of geological events, as determined by their position in the rock record, is known as

(A) relative dating
(B) correlation
(C) absolute dating
(D) uniformitarianism

Q.12 Time equivalence of rock units in different areas can be established primarily by considering similarity in

(A) lithology
(B) fossil assemblages
(C) sedimentary structures
(D) mineral assemblages

Q.13 Which of the following volcanic events has been suggested as a major cause of the extinction of dinosaurs?

(A) Panjal volcanism
(B) Deccan volcanism
(C) Rajmahal volcanism
(D) Malani volcanism

Q.14 Bode's law expresses the approximate distance between

(A) earth and other planets
(B) moon and sun
(C) planets and sun
(D) moon and earth

Q.15 India's northward drift from Gondwanaland is believed to have started approximately (in million years ago, Ma)

(A) 50 Ma (B) 150 Ma (C) 300 Ma (D) 400 Ma

Q.16 Which of the following instruments contains piezoelectric material?

(A) hydrophone
(B) geophone
(C) gravimeter
(D) magnetometer

Q.17 If the average crustal thickness is 35 km and the height of a mountain is 5 km above mean sea level, the crustal thickness based on Airy's model beneath the mountain will be approximately

(A) 35 km (B) 40 km (C) 50 km (D) 70 km

Q.18 The equipotential surface over which the gravitational field has equal value is known as

(A) geoid
(B) spheroid
(C) ellipsoid
(D) mean sea level

Q.19 The angle between the present geographic north and geomagnetic north is

(A) 1.5° (B) 7.5° (C) 11.5° (D) 23.5°

Q.20 Among the following, the best reconnaissance method for determining basement configuration of sedimentary basins is

(A) gravity method
(B) self potential method
(C) seismic method
(D) electromagnetic method

Q.21 Cooling of basaltic lava under water will lead to the formation of

(A) lava tunnel
(B) pillow structure
(C) columnar jointing
(D) cumulus texture

Q.22 What rock would you expect to find at the base of a typical oceanic plate?

(A) Basalt (B) Diorite (C) Gabbro (D) Peridotite

Q.23 Major coal deposits of India are found in the

(A) Cuddapah Supergroup
(B) Vindhyan Supergroup
(C) Gondwana Supergroup
(D) Dharwar Supergroup

Q.24 Which of the following is a product of residual weathering process?

(A) Placer gold
(B) Banded iron ore
(C) Bauxite
(D) Porphyry copper

Q.25 Choose the correct combination of ore and location of its deposit.

(A) Uranium – Jaduguda
(B) Lead – Khetri
(C) Gold – Panna
(D) Iron – Malanjkhand

END OF PART A

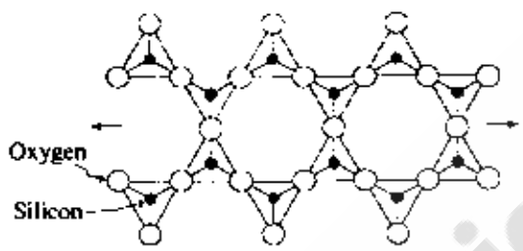
PART B (SECTION 1): FOR GEOLOGY CANDIDATES ONLY

Q.26 – Q.55 carry two marks each.

Q.26 The age of the oldest rocks in present-day ocean basins is

(A) Devonian (B) Jurassic (C) Eocene (D) Permian

Q.27 Silicon to oxygen ratio in the following silicate structure is



(A) 1 : 2 (B) 2 : 5 (C) 4 : 11 (D) 1 : 3

Q.28 Direct precipitation of uraninite from a mineralizing solution containing UO_2^{2+} ions can take place due to

(A) increase in Eh (B) decrease in Eh
(C) increase in pH (D) decrease in pH

Q.29 Match the optical properties in **Group I** with appropriate minerals in **Group II.**

Group I	**Group II**
P. Twinkling	1. Quartz
Q. Pleochroic haloes	2. Nepheline
R. Anomalous interference colour	3. Calcite
S. Uniaxial positive	4. Chlorite
	5. Biotite

(A) P – 4, Q – 5, R – 3, S – 2 (B) P – 3, Q – 4, R – 5, S – 2
(C) P – 3, Q – 5, R – 4, S – 1 (D) P – 3, Q – 4, R – 5, S – 1

Q.30 Wall-rock alteration producing epidote, albite and chlorite around an ore body is called

(A) argillic alteration (B) propylitic alteration
(C) potassic-silicate alteration (D) sericite alteration

Q.31 Match the textures/structures in **Group I** with appropriate processes in **Group II**.

Group I	**Group II**
P. Cumulus texture	1. Cavity filling
Q. Spinifex texture	2. Gravity settling
R. Oriented intergrowth	3. Annealing
S. Comb structure	4. Quenching
	5. Coherent exsolution

(A) P – 2, Q – 4, R – 5, S – 1
(B) P – 3, Q – 1, R – 2, S – 5
(C) P – 1, Q – 5, R – 4, S – 3
(D) P – 2, Q – 5, R – 4, S – 1

Q.32 An area shows linear erosional depression, sag pond, spring and offset stream along with sub-horizontal slickensides. The prominent structure indicated by these features is

(A) strike-slip fault
(B) horst and graben
(C) klippe
(D) nappe

Q.33 Match the ore types in **Group I** with appropriate path-finder elements in **Group II**.

Group I	**Group II**
P. Porphyry Cu ore	1. As
Q. Vein type Au ore	2. Hg
R. Pb-Zn-Ag ores	3. Cr
	4. Mo
	5. Ni

(A) P – 4, Q – 1, R – 2
(B) P – 3, Q – 2, R – 1
(C) P – 4, Q – 3, R – 5
(D) P – 5, Q – 4, R – 2

Q.34 Match the nature of mass movements listed in **Group I** with the evidences listed in **Group II**.

Group I	**Group II**
P. Creep	1.Tounge-shaped mass movement
Q. Earth flow	2. Curved tree trunks
R. Slump	3. Scree formation at the base
	4. Curved surface of rupture

(A) P-2, Q-1, R-4
(B) P-1, Q-3, R-4
(C) P-4, Q-2, R-1
(D) P-4, Q-3, R-2

Q.35 Which of the following metamorphic facies is characterized by the pyrope rich garnet + omphacite assemblage?

(A) Blueschist
(B) Eclogite
(C) Greenschist
(D) Granulite

Q.36 Match the gemstones in **Group I** with corresponding minerals in **Group II**.

Group I	**Group II**
P. Peridote	1. Beryl
Q. Emerald	2. Feldspar
R. Amazonite	3. Corundum
S. Ruby	4. Olivine

(A) P-4, Q-1, R-2, S-3
(B) P-1, Q-3, R-2, S-4
(C) P-2, Q-4, R-1, S-3
(D) P-3, Q-4, R-1, S-2

Q.37 Which of the following statements is **NOT** correct with regard to a perched water table?

(A) It is within an area where a local aquiclude occurs within a larger aquifer
(B) It lies above the main water table
(C) It is found in the main zone of saturation
(D) It is occasionally associated with springs

Q.38 The spatial resolution of IRS LISS-III multi-spectral sensor for Near Infra-Red (NIR) band is

(A) 5.8 m × 5.8 m (B) 23.5 m × 23.5 m (C) 70 m × 70 m (D) 72.5 m × 72.5 m

Q.39 Which of the following combinations of extinction events and extinct organisms is **NOT** correct?

(A) Cretaceous end – Dinosaurs
(B) Triassic end – Conodonts
(C) Permian end – Trilobites
(D) Miocene end – Ammonites

Q.40 In India, marine fossiliferous rocks of lower Paleozoic age are mainly found in the

(A) Gondwana
(B) Higher Himalaya
(C) Outer Himalaya
(D) Tethys Himalaya

Q.41 Which of the following pairs of rock formations and characteristic fossils is correct?

(A) Raniganj – *Elephas*
(B) Pinjor – *Titanosaurus*
(C) Lameta – *Glossopteris*
(D) Subathu – *Nummulites*

Q.42 Which of the following groups of rock formations is **NOT** arranged from older to younger?

(A) Uttatur – Trichinopoly – Ariyalur – Niniyur
(B) Patcham – Katrol – Chari – Umia
(C) Talchir – Damuda – Panchet – Mahadev
(D) Semri – Kaimur – Rewa –Bhander

Q.43 Choose the correct combination of geological agents and associated features.

(A) River – Spit
(B) Glacier – Yardang
(C) Longshore current – Esker
(D) Wind – Ventifact

Q.44 A sedimentary sequence dominated by large scale (5-10 m thick) cross beds, well-sorted and well-rounded quartz-rich sand with no fine matrix is most likely to be a

(A) deltaic deposit
(B) lagoonal deposit
(C) eolian deposit
(D) outer shelf deposit

Q.45 An invertebrate in which the plane of symmetry bisects the shell through the mid-point of the hinge is a

(A) Pelecypod (B) Brachiopod (C) Gastropod (D) Caphalopod

Q.46 The oldest mammals and birds are known, respectively, from

(A) Cretaceous and Paleocene
(B) Silurian and Devonian
(C) Triassic and Jurassic
(D) Oligocene and Miocene

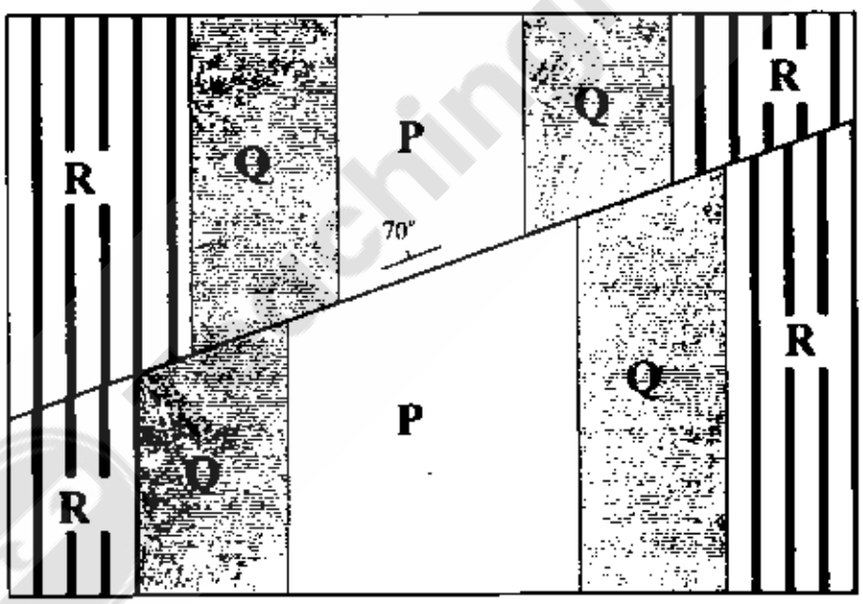
Q.47 Allochems in a limestone consist of

(A) micrite only
(B) spar only
(C) ooids only
(D) bioclasts and ooids

Common Data Questions

Common Data for Questions 48 and 49:

The following geological map exposes three beds, of which the bed P is the oldest and the bed R the youngest.



Q.48 What type of structure does the map depict?

(A) Faulted anticline (B) Folded strike-slip fault
(C) Faulted syncline (D) Folded normal fault

Q.49 Why is bed P wider in the area south of fault?

(A) Erosion has removed most of bed P to the north of fault
(B) Folding has caused thinning of bed P to the north of fault
(C) Deeper level of bed P is exposed due to faulting and erosion to the south of fault
(D) Bed P had a variable thickness prior to faulting

Common Data for Questions 50 and 51:

A sequence of shale and limestone is intruded by an igneous pluton. Metasomatic interaction between the pluton and the country rocks involves introduction of Si and Al into dolomitic limestone.

Q.50 Which pair of rock types best describes the products of metamorphism in the contact aureole?

(A) Slate and schist
(B) Schist and hornfels
(C) Schist and skarn
(D) Hornfels and skarn

Q.51 The mineral which is **NOT** expected in assemblages in the metamorphosed dolomitic limestone is

(A) grossular
(B) anorthite
(C) diopside
(D) andalusite

Linked Answer Questions

Statement for Linked Answer Questions 52 and 53:

A pluton of iron-poor basic magma containing trace concentrations of Ni, Rb, Sr and V undergoes crystallization upon cooling.

Q.52 The first mineral to crystallize will be

(A) augite (B) hornblende (C) olivine (D) oligoclase

Q.53 The trace element that will be preferentially incorporated in the correct mineral in Q. 52 is

(A) Ni (B) Rb (C) Sr (D) V

Linked Answer Questions 54 and 55:

Q.54 Silica-undersaturated minerals are

(A) nepheline and albite
(B) olivine and enstatite
(C) leucite and orthoclase
(D) olivine and leucite

Q.55 The Hermann-Mauguin symbols of crystallographic notation for the correct minerals in Q. 54 are

(A) 2/m2/m2/m and 4/m
(B) 2/m2/m2/m for both
(C) 4/m and 2/m
(D) 6 and $\bar{1}$

END OF SECTION 1 OF PART B

PART B (SECTION 2): FOR GEOPHYSICS CANDIDATES ONLY

Q.26 – Q.55 carry two marks each.

Q.26 The gravity value measured at the base of a 10 m tall building is 40 mGal. The value at the top of the building ignoring its mass is close to

(A) 20 mGal (B) 37 mGal (C) 40 mGal (D) 43 mGal

Q.27 Upward continuation technique filters _____ wavelength anomalies and _____ their amplitudes.

(A) short, reduces
(B) long, enhances
(C) long, reduces
(D) short, enhances

Q.28 The relative intensities of induced and remanent magnetization are commonly expressed in terms of

(A) susceptibility
(B) gyromagnetic ratio
(C) Poisson's ratio
(D) Königsberger ratio

Q.29 In electrical resistivity method, which among the following is correct with reference to Geometric Factor (GF)?

(A) GF varies for profiling and remains constant for sounding
(B) GF remains constant for both profiling and sounding
(C) GF remains constant for profiling and varies for sounding
(D) GF varies for both profiling and sounding

Q.30 If in a magnetic dipole 'm' represents poles of equal strength and 'l' represents the distance between the two poles, then the magnetic moment of dipole is

(A) lm (B) $\frac{l}{m}$ (C) $2lm$ (D) $\frac{lm}{2}$

Q.31 Energy in radioactive decay with respect to time follows

(A) normal distribution
(B) Poisson distribution
(C) chi-squared distribution
(D) binomial distribution

Q.32 The logging technique that uses non-conductive drilling fluids is

(A) SP logging
(B) Resistivity logging
(C) Induction logging
(D) Radiometric logging

Q.33 Unguided random-walk inversion technique signifies

(A) Genetic algorithm
(B) Simulated annealing
(C) Monte Carlo inversion
(D) Metropolis algorithm

Q.34 The compressional wave velocity V_p within a solid with adiabatic bulk modulus K_s, rigidity modulus G and density ρ is given by

(A) $V_p = \sqrt{\frac{K_s + (5/3)G}{\rho}}$ (B) $V_p = \sqrt{\frac{K_s + (2/3)G}{\rho}}$

(C) $V_p = \sqrt{\frac{K_s + (1/3)G}{\rho}}$ (D) $V_p = \sqrt{\frac{K_s + (4/3)G}{\rho}}$

Q.35 The number of independent elements of the 4th order stiffness tensor required to characterize general elastic media is

(A) 2 (B) 21 (C) 36 (D) 81

Q.36 The seismic energy released in an earthquake of magnitude M_s = 7.0 is about _____ times that released in an earthquake of M_s = 6.0.

(A) 10 (B) 32 (C) 64 (D) 100

Q.37 In the figure given below "–" represents dilatation and "+" represents compression. The fault plane solution of an earthquake with strike-slip mechanism is represented by

(A) P (B) Q (C) R (D) S

Q.38 The anelastic attenuation of seismic energy depends on

(A) quality factor
(B) particle acceleration
(C) stress drop
(D) particle velocity

Q.39 The seismic wave travelling in low velocity layer and critically incident at the discontinuity between low and high velocity layers

(A) will be diffracted
(B) will be reflected
(C) will propagate along the discontinuity
(D) will be absorbed

Q.40 An input signal {-1,1,0,2}, after passing through a delay operator z, will be

(A) $-z^2 + z^3 + 2z^5$
(B) {0, –1, 1, 0, 2}
(C) {0, 2, 0, 1, –1}
(D) $-z + z^2 + 2z^4$

Q.41 If m represents the number of model parameters, d the number of data points and p the rank of matrix to be inverted, then which of the following defines an underdetermined system?

(A) $m < d$ and $p = d$
(B) $m > d$ and $p = d$
(C) $m = d$ and $p = d$
(D) $m < d$ and $p \neq d$

Q.42 A unit amplitude of an electromagnetic wave at thrice the skin-depth will be reduced to

(A) $-3e$ (B) $\frac{3}{e}$ (C) $\frac{e}{3}$ (D) e^{-3}

Q.43 The Hilbert transform of a function $f(t)$ is denoted by $H(f(t))$. If $f(t) = \sin t$, then $H\{H(f(t))\}$ is

(A) $-\sin t$ (B) $-\cos t$ (C) $\sin t$ (D) $\cos t$

Q.44 The rectangular function $\pi(t)$ is defined as $\pi(t) = 1 \quad |t| \leq 1/2$
$= 0 \quad |t| > 1/2$

The convolution of $\pi(t)$ with itself will be

(A) a triangular function $\Lambda(t)$
(B) $\pi(t)$ again
(C) a unit-step function u(t)
(D) a delta function $\delta(t)$

Q.45 Given $A = e^{-y}(\cos x \mathbf{a}_x - \sin x \mathbf{a}_y)$, where $\mathbf{a}_x$ and $\mathbf{a}_y$ denote the unit vectors in x- and y-directions, respectively. Then $\nabla \cdot (\nabla \times A)$ is equal to

(A) e^{-y} (B) 0 (C) $e^{-y}(\cos x)$ (D) $e^{-y}(\sin x)$

Q.46 Match the items in **Group I** with those in **Group II**.

Group I	**Group II**
P. Convolution in time domain	1. $\frac{1}{2\Delta t}$
Q. Nyquist frequency	2. Flat spectrum
R. Aliasing	3. Multiplication in frequency domain
S. White noise	4. Frequency folding
	5. Autocorrelation function

(A) P-3, Q-1, R-4, S-2
(B) P-2, Q-1, R-5, S-4
(C) P-3, Q-1, R-2, S-1
(D) P-2, Q-4, R-1, S-5

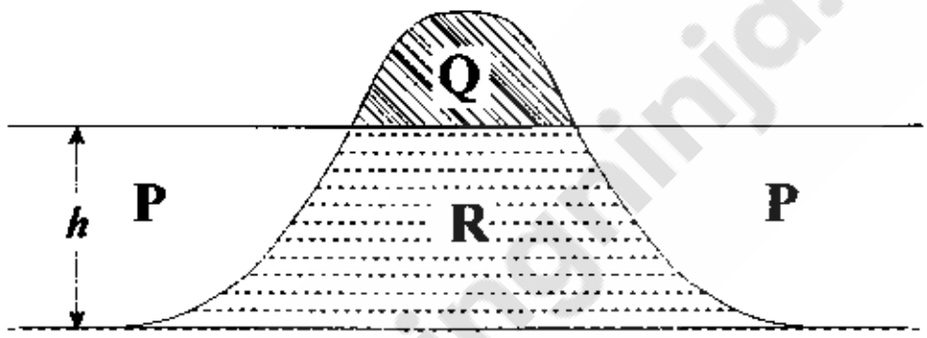
Q.47 In magnetic materials, the relation between magnetic permeability μ and susceptibility κ (in SI units) is

(A) $\mu = 1/\kappa$
(B) $\mu = 1 - \kappa$
(C) $\mu = 1 + \kappa$
(D) $\mu = 1 - 2\pi\kappa$

Common Data Questions

Common Data for Questions 48 and 49:

The terrain correction in gravity method accounts for topographic relief in the vicinity of the observation point. The Bouguer slab assumes the topography around the observation point to be flat. In the figure below, the Bouguer slab thickness is h and the hollow portion **P** lies within the Bouguer slab. **Q** and **R** are parts of the topography.



Q.48 In the region **P**, the terrain correction is

(A) half of that in **R**
(B) negative
(C) zero
(D) positive

Q.49 In the region **Q**, the terrain correction is required to account for

(A) hollow portion **P**
(B) reduced gravity due to excess mass in portion **Q**
(C) increased gravity due to excess mass in portion **Q**
(D) over-correction of Bouguer slab

Common Data for Questions 50 and 51:

For an input x_n, the output of a digital filter y_n is given by $y_n = 1.5x_n - 2x_{n-1} + 2.5y_{n-2}$.

Q.50 The order of the digital filter is

(A) 4 (B) 3 (C) 2 (D) 1

Q.51 The transfer function of the digital filter is

(A) $\frac{y_n}{x_n} = \frac{1.5 - 2z}{1 - 2.5z}$
(B) $\frac{y_n}{x_n} = \frac{1.5 - 2z}{1 - 2.5z^2}$
(C) $\frac{y_n}{x_n} = \frac{1 - 2.5z^2}{1.5 - 2z}$
(D) $\frac{y_n}{x_n} = \frac{1.5 - 2z}{1 + 2.5z^2}$

Linked Answer Questions

Statement for Linked Answer Questions 52 and 53:

In a two-layer earth model, the values of seismic velocity and density of first and second layers, respectively, are $V_{p1} = 4000$ m/s, $\rho_1 = 2500$ Kg/ m^3, and $V_{p2} = 4500$ m/s, $\rho_2 = 2600$ Kg/ m^3.

Q.52 The acoustic impedance of the first layer in SI units at normal incidence is

(A) 10^3 (B) 10^4 (C) 10^5 (D) 10^7

Q.53 The transmission coefficient for a wave at normal incidence at the boundary of first and second layer is

(A) 0.46 (B) 0.58 (C) 0.92 (D) 1.07

Statement for Linked Answer Questions 54 and 55:

Consider a magnetotelluric (MT) field set up. A plane electromagnetic wave with a time dependence factor $e^{-i\omega t}$ is travelling vertically downwards (z-direction) into the Earth with an angular frequency ω. The electric field is polarized in the x-direction (strike).

Q.54 The electromagnetic field components considered in this mode are

(A) E_x, H_y and H_z (B) E_z, H_x and H_z (C) E_x, H_y and E_z (D) E_y, H_x and H_z

Q.55 Which of the following equations represents the above mode?

(A) $E_x = \dfrac{-1}{i\omega\mu}\dfrac{\partial H_z}{\partial z}$ (B) $H_x = \dfrac{-1}{i\omega\mu}\dfrac{\partial E_z}{\partial z}$ (C) $H_y = \dfrac{1}{i\omega\mu}\dfrac{\partial E_z}{\partial z}$ (D) $H_x = \dfrac{1}{i\omega\mu}\dfrac{\partial E_x}{\partial z}$

END OF SECTION 2 OF PART B

General Aptitude (GA) Questions

Q.56 – Q.60 carry one mark each.

Q.56 *Choose the most appropriate word from the options given below to complete the following sentence:*
His rather casual remarks on politics _____ his lack of seriousness about the subject.

(A) masked
(B) belied
(C) betrayed
(D) suppressed

Q.57 *Which of the following options is the closest in meaning to the word below:*
Circuitous

(A) cyclic
(B) indirect
(C) confusing
(D) crooked

Q.58 *Choose the most appropriate word from the options given below to complete the following sentence:*
If we manage to _____ our natural resources, we would leave a better planet for our children.

(A) uphold
(B) restrain
(C) cherish
(D) conserve

Q.59 25 persons are in a room. 15 of them play hockey, 17 of them play football and 10 of them play both hockey and football. Then the number of persons playing neither hockey nor football is:

(A) 2 (B) 17 (C) 13 (D) 3

Q.60 *The question below consists of a pair of related words followed by four pairs of words. Select the pair that best expresses the relation in the original pair.*
Unemployed : Worker

(A) fallow : land
(B) unaware : sleeper
(C) wit : jester
(D) renovated : house

Q.61 – Q.65 carry two marks each.

Q.61 If 137 + 276 = 435 how much is 731 + 672?

(A) 534 (B) 1403 (C) 1623 (D) 1513

Q.62 Hari (H), Gita (G), Irfan (I) and Saira (S) are siblings (i.e. brothers and sisters). All were born on 1st January. The age difference between any two successive siblings (that is born one after another) is less than 3 years. Given the following facts:

i. Hari's age + Gita's age > Irfan's age + Saira's age.
ii. The age difference between Gita and Saira is 1 year. However, Gita is not the oldest and Saira is not the youngest.
iii. There are no twins.

In what order were they born (oldest first)?

(A) HSIG (B) SGHI (C) IGSH (D) IHSG

Q.63 **Modern warfare has changed from large scale clashes of armies to suppression of civilian populations. Chemical agents that do their work silently appear to be suited to such warfare; and regretfully, there exist people in military establishments who think that chemical agents are useful tools for their cause.**

Which of the following statements best sums up the meaning of the above passage:

(A) Modern warfare has resulted in civil strife.
(B) Chemical agents are useful in modern warfare.
(C) Use of chemical agents in warfare would be undesirable.
(D) People in military establishments like to use chemical agents in war.

Q.64 5 skilled workers can build a wall in 20 days; 8 semi-skilled workers can build a wall in 25 days; 10 unskilled workers can build a wall in 30 days. If a team has 2 skilled, 6 semi-skilled and 5 unskilled workers, how long will it take to build the wall?

(A) 20 days (B) 18 days (C) 16 days (D) 15 days

Q.65 Given digits 2, 2, 3, 3, 3, 4, 4, 4, 4 how many distinct 4 digit numbers greater than 3000 can be formed?

(A) 50 (B) 51 (C) 52 (D) 54

END OF THE QUESTION PAPER

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