# GATE 2012 Online Examination
# GG : GEOLOGY AND GEOPHYSICS

*Duration*: Three Hours *Maximum Marks*:

**Read the following instructions carefully.**

1. The computer allotted to you at the examination center runs a specialized software that permits only one answer to be selected for multiple choice questions using a mouse. Your answers shall be updated and saved on a server periodically and at the end of the examination.
2. To login, enter your Registration Number and password provided in the envelope. Go through the symbols used in the test and understand the meaning before you start the examination. You can view all questions by clicking on the View All Questions button in the screen after the start of the examination.
3. To answer a question, select the question using the selection panel on the screen and choose the correct answer by clicking on the radio button next to the answer. To change the answer, just click on another option. If you wish to leave a previously answered question unanswered, click on the button next to the selected option.
4. The examination will automatically stop at the end of 3 hours.
5. There are a total of 65 questions carrying 100 marks. Except questions Q.26 – Q.30, all the other questions are of multiple choice type with only **one** correct answer. Questions Q.26 - Q.30 require a numerical answer, and a number should be entered using the virtual keyboard on the monitor.
6. Questions Q.1 – Q.25 of Part-A are common to both Geology and Geophysics and carry 1 mark each. Part B contains two sections: Section 1 (Geology) only for Geology candidates and Section 2 (Geophysics) only for Geophysics candidates. Questions Q.26 – Q.55 in each of these sections carry 2 marks each. The 2 marks questions include two pairs of common data questions and two pairs of linked answer questions. The answer to the second question of the linked answer questions depends on the answer to the first question of the pair. If the first question in the linked pair is wrongly answered or is unattempted, then the answer to the second question in the pair will not be evaluated.
7. Questions Q.56 – Q.65 belong to General Aptitude (GA) section and carry a total of 15 marks. Questions Q.56 – Q.60 carry 1 mark each, and questions Q.61 – Q.65 carry 2 marks each.
8. Unattempted questions will result in zero mark and wrong answers will result in **NEGATIVE** marks. There is no negative marking for questions of numerical answer type, i.e., for Q.26 – Q.30. For all 1 mark questions, ⅓ mark will be deducted for each wrong answer. For all 2 marks questions, ⅔ mark will be deducted for each wrong answer. However, in the case of the linked answer question pair, there will be negative marks only for wrong answer to the first question and no negative marks for wrong answer to the second question.
9. Calculator is allowed. Charts, graph sheets or tables are **NOT** allowed in the examination hall. Do the rough work in the Scribble Pad provided.
10. You must sign this sheet and leave it with the invigilators at the end of the examination.

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**DECLARATION:** I hereby declare that I have read and followed all the instructions given in this sheet.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Registration Number** | **GG** | | | | | | | |
| **Name** | | | | | | | | |
| **Signature** | | | | | | | | |

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|---|---|
| **Verified that the above entries are correct.** Invigilator's signature: | |

## PART A: COMMON TO BOTH GEOLOGY AND GEOPHYSICS CANDID[illegible]

## Q. 1 – Q. 25 carry one mark each.

Q.1 In Mohs' scale of hardness, how many minerals are of silicate composition?

(A) 4 (B) 5 (C) 6 (D) 7

Q.2 Which one of the following river systems forms the largest fluvio-deltaic system in the world?

(A) Mississippi–Ohio (B) Red–Mekong
(C) Ganga–Brahmaputra (D) Yellow–Ba Hoi

Q.3 Which one amongst the following rocks commonly has highest unconfined compressive strength?

(A) Coarse-grained sandstone (B) Mica schist
(C) Fossiliferous limestone (D) Massive basalt

Q.4 Eparchean unconformity separates geological units of

(A) early Archaean from late Archaean (B) Archaean from Proterozoic
(C) Proterozoic from Palaeozoic (D) Archaean from Phanerozoic

Q.5 Point bar deposit is associated with

(A) braided river (B) estuary
(C) meandering river (D) beach

Q.6 Polymetallic nodules on the ocean floor contain significant amounts of:

(A) Cu–Ni–Co (B) Pb–Zn–Ti
(C) Hg–Mo–Pt (D) U–Th–Nb

Q.7 If the rake of net slip of an inclined fault is 90°, the fault is

(A) strike-slip fault (B) dip-slip fault
(C) oblique-slip fault (D) transcurrent fault

Q.8 On a photo-scale of 1:40000, a square shaped open cast coal mine of 1 $km^2$ area would have an area of (in $cm^2$)

(A) 2.50 (B) 4.00 (C) 6.25 (D) 12.00

Q.9 Bouguer correction is applied to correct for the gravity anomaly due to mass between station location and

(A) mean sea level (B) local datum plane
(C) base of upper crust (D) Mohorovicic discontinuity

Q.10 Which one of the following can be estimated from SP log against a saline-water saturated sandstone formation encountered in a well?

(A) Resistivity of formation water (B) Degree of water saturation
(C) Depth of invasion (D) Permeability

Q.11 During its orbital motion around the Sun, the Earth is nearest to the Sun on

(A) March 21 (B) July 4
(C) September 23 (D) January 3

Q.12 Which one of the following can be best explored using electromagnetic method?

(A) Oil-bearing strata
(B) Coal-bearing strata
(C) Disseminated sulphide deposit
(D) Massive sulphide deposit

Q.13 Name the planet in the solar system which has its "day" longer than its "year".

(A) Mercury
(B) Venus
(C) Mars
(D) Neptune

Q.14 The most sensitive instrument for magnetic survey is

(A) magnetic field balance
(B) fluxgate magnetometer
(C) proton precession magnetometer
(D) optically pumped magnetometer

Q.15 Which physical property of the medium governs the response of Ground Penetrating Radar (GPR)?

(A) Electrical conductivity
(B) Electromagnetic conductivity
(C) Seismic wave velocity
(D) Electrical permeability (dielectric permittivity)

Q.16 Out of the following gases which one has the highest contribution towards the greenhouse effect on the Earth?

(A) $CO_2$ (B) CO (C) $CH_4$ (D) $H_2O$

Q.17 Depth range of the 'transition zone' associated with phase changes in the Earth's mantle is (in km)

(A) 35 to 150
(B) 150 to 410
(C) 410 to 660
(D) 660 to 800

Q.18 Choose the correct pair of plutonic rock and its volcanic equivalent.

(A) Gabbro–Trachyte
(B) Syenite–Andesite
(C) Granite–Rhyolite
(D) Granodiorite–Basalt

Q.19 Which of the following is **NOT** a variety of silica ($SiO_2$)?

(A) Jasper
(B) Coesite
(C) Stishovite
(D) Flinkite

Q.20 Which one of these is **NOT** a source of sufficient water supply but can transmit certain quantity of water on a regional scale due to leakage?

(A) Aquifer
(B) Aquitard
(C) Aquiclude
(D) Aquifuge

Q.21 Identify the type of fault present in the given aerial photograph.

(A) Normal fault
(B) Reverse fault
(C) Left-lateral strike-slip fault
(D) Right-lateral strike-slip fault

Q.22 The Jurassic stratigraphic succession of Kutch is characterized by which one of the following?

(A) Cephalopods
(B) Trilobites
(C) Brachiopods
(D) Graptolites

Q.23 Which one of the following mineral constituents exhibits strong absorption in the UV-blue band of the EM spectrum due to charge transfer effect leading to colouration?

(A) Fe-O (B) Si-O (C) Al-OH (D) Mg-OH

Q.24 When did the supercontinent Pangaea begin to break up?

(A) Cenozoic
(B) Mesozoic
(C) Palaeozoic
(D) Proterozoic

Q.25 In which of the following localities does coal deposit occur?

(A) Dariba
(B) Kudremukh
(C) Wardha
(D) Rudrasagar

## PART B (SECTION 1): FOR GEOLOGY CANDIDATES ONLY

### Q. 26 to Q. 55 carry two marks each.

Q.26 Specific discharge of 1 cm per day is observed in a porous medium where hydraulic head difference is 0.5 m and flow length is 20 m. Calculate the hydraulic conductivity (in m/day).

(A) 0.4 (B) 0.8 (C) 1.2 (D) 1.6

Q.27 A sandstone bed dipping 30° has an outcrop width of 20 m in a flat terrain. What is the true thickness (in m) of the bed?

(A) 5 (B) 10 (C) 20 (D) 30

Q.28 Calculate the concentration (in ppm) of Ni in olivine that crystallizes from a basaltic magma containing 20 ppm Ni. The partition coefficient (solid/melt) of nickel is 5.

(A) 4 (B) 20 (C) 100 (D) 500

Q.29 An analysis of augite yields 3 silicon atoms calculated on the basis of 12 oxygen atoms. If only Al replaces Si, calculate the number of tetrahedral-Al in the mineral.

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

Q.30 Calculate the degree(s) of freedom of the assemblage orthopyroxene + clinopyroxene + plagioclase + hornblende + quartz + fluid in the chemical system $CaO–FeO–MgO–Al_2O_3–SiO_2–H_2O$ with pressure and temperature as physical variables.

(A) 0 (B) 1 (C) 2 (D) 3

Q.31 Ca-montmorillonite is formed by the chemical weathering of

(A) calcite (B) augite
(C) orthoclase (D) forsterite

Q.32 In which of the following crystal systems, the characteristic symmetry elements “a two-fold axis of rotation and at least two planes of symmetry” are possible?

(A) Tetragonal (B) Hexagonal
(C) Orthorhombic (D) Monoclinic

Q.33 Determine the correctness or otherwise of the following **Assertion [a] and Reason [r]**.

**Assertion:** Biaxial minerals can be pleochroic in three shades.

**Reason:** Biaxial minerals have three refractive indices.

(A) Both [a] and [r] are true and [r] is the correct reason for [a]
(B) [a] is true but [r] is false
(C) [a] is false but [r] is true
(D) Both [a] and [r] are true but [r] is not the correct reason for [a]

Q.34 The correct sequence of metamorphic facies with increasing depth in a subduction zone is

(A) greenschist, blueschist, eclogite (B) greenschist, eclogite, blueschist
(C) blueschist, greenschist, eclogite (D) blueschist, eclogite, greenschist

Q.35 Which one of the following basins is producing petroleum from the coal-rich reservoir

(A) Rajasthan Basin
(B) Cambay Basin
(C) Cauvery Basin
(D) Krishna–Godavari Basin

Q.36 A major thrust in the Himalayas has resulted in intense shearing of a zone about 0.5 km wide on either side of the thrust leading to landslides. Which GIS function can be used to display the shear zone?

(A) Contiguity (adjacency)
(B) Spread
(C) Proximity (buffer)
(D) Search

Q.37 Vertical exaggeration commonly occurs during stereo-viewing of aerial photographs. Where does it occur?

(A) In the photographs
(B) In the terrain
(C) In the stereoscope
(D) In the perceptor's mind

Q.38 A potassic ultrabasic hybrid igneous rock containing macrocrysts of olivine, Cr-rich diopside, phlogopite and pyrope in a groundmass of serpentine, carbonate and perovskite can be named as

(A) kimberlite
(B) ijolite
(C) melilitolite
(D) harzburgite

Q.39 Herringbone structure is generally formed in which of the following environments?

(A) Fluvial
(B) Aeolian
(C) Lacustrine
(D) Tidal

Q.40 In a typical coal mine area affected by acid mine drainage, which one of the following acids will be dominant?

(A) Nitric acid
(B) Sulphuric acid
(C) Hydrochloric acid
(D) Hydrofluoric acid

Q.41 Match the items in **Group I** with those in **Group II.**

| **Group I** | **Group II** |
|---|---|
| P. Theca | 1. Trilobite |
| Q. Midrib | 2. Brachiopod |
| R. Deltidium | 3. Glossopteris |
| S. Pygidium | 4. Graptolite |
| | 5. Diatoms |

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

Q.42 Arrange the following formations sequentially from older to younger:

P. Sargur Schist
Q. Kajrahat Limestone
R. Cuddalore Sandstone
S. Umia Ammonite Bed

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

Q.43 Which of the following statements is true?

(A) Transposition foliation is an indication of superposed folding
(B) Stratigraphic information is retained in transposition structures
(C) Transposition foliation develops parallel to axial plane of tight folds
(D) Fold closures can be well identified in transposition structures

Q.44 Match the items in **Group I** with those in **Group II.**

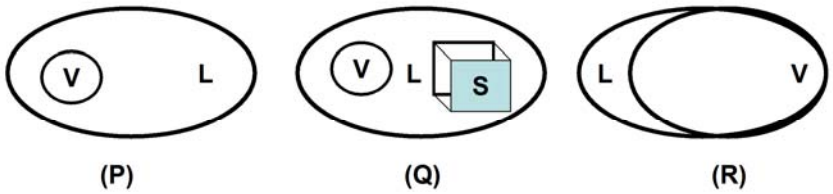
| **Group I** | **Group II** |
|---|---|
| P. Churching | 1. Concrete gravity dam |
| Q. Curtain grouting | 2. Tunnelling |
| R. Piping | 3. Cement |
| S. Pozzolan | 4. Earth dam |

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

Q.45 A horizontally bedded sandstone outcrop exhibits planar cross-beds at a number of places. The dip directions of the foresets of cross-beds at these locations are:
N350°, N17°, N355°, N355°, N15°, N360°, N350°, N13°, N350°, N355°.
Find the mean palaeocurrent direction.

(A) N15° (B) N350° (C) N355° (D) N360°

Q.46 Salinity of three different fluid inclusions in $H_2O$-NaCl system is to be determined by "heating–freezing" experiments. The phase proportions of inclusions at room temperature are shown below:



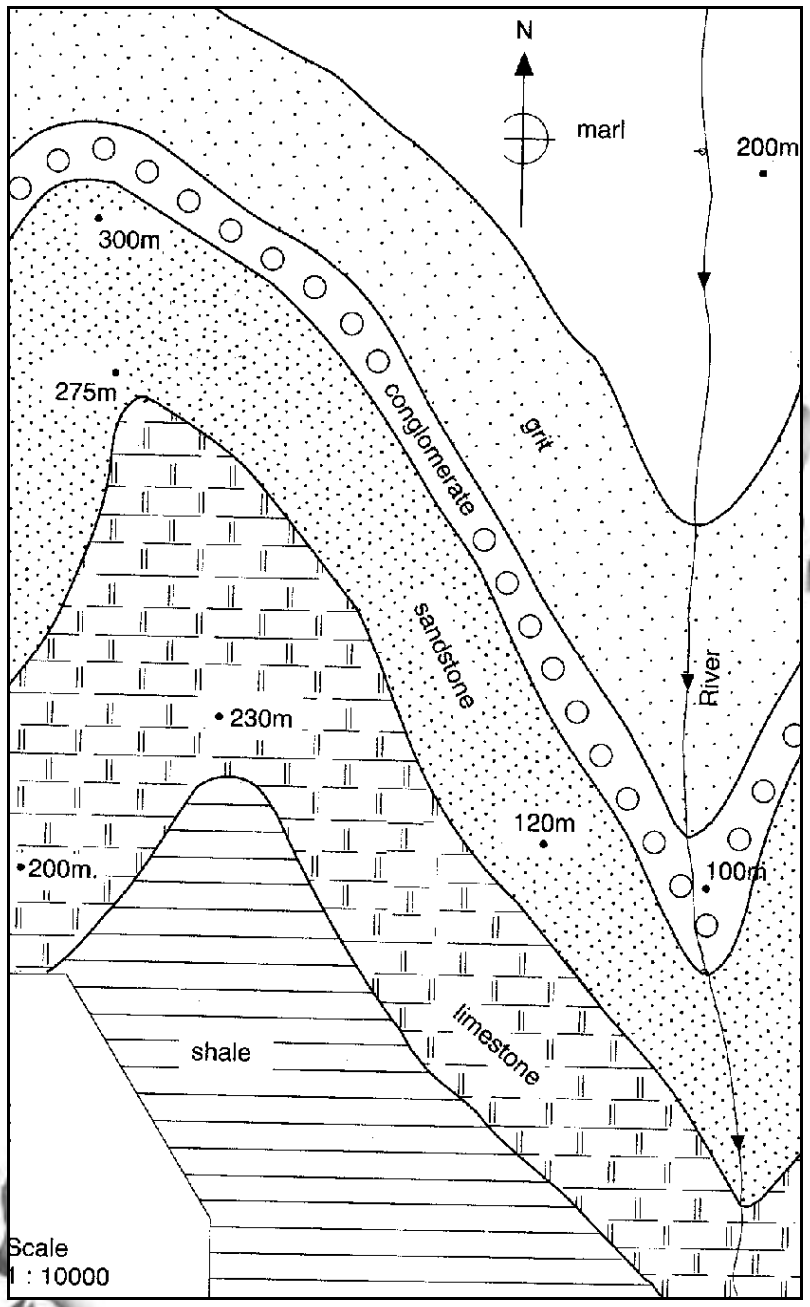

(P) (Q) (R)

**V : Vapour; L : Liquid ($H_2O$); S : Solid (Halite)**

The salinity can be determined by

(A) heating of P, freezing of Q
(B) heating of Q, freezing of R
(C) freezing of P, heating of R
(D) heating of all P, Q and R

Q.47 Study the map below showing elevation of selected locations and outcrops of sediment



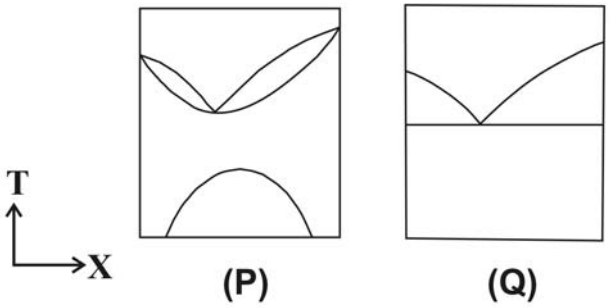

Which of the following statements is correct?

(A) The beds dip easterly
(B) The beds dip westerly
(C) The beds dip southerly
(D) The beds are folded

## Common Data Questions

**Common Data for Questions 48 and 49:**

The figures P and Q represent schematic binary phase diagrams for solid–melt and subsolidus relations in temperature (T)–composition (X) space.




Q.48 Which of the following statements is true?

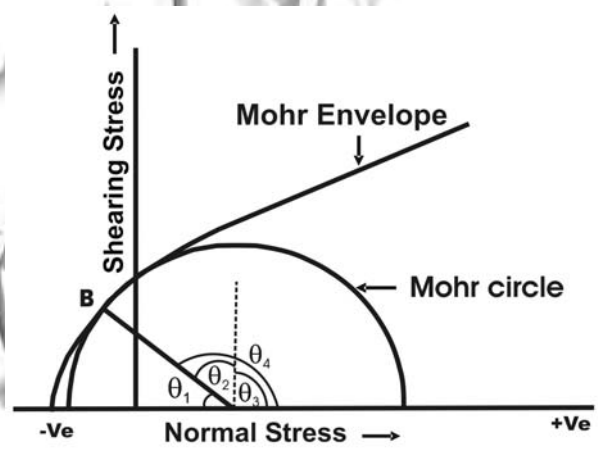
(A) P shows eutectic relation and Q shows high temperature limited solid solution
(B) Both P and Q show high temperature limited solid solution
(C) Both P and Q show eutectic relation
(D) P shows high temperature limited solid solution and Q shows eutectic relation

Q.49 Choose the correct statement?

(A) Solvus occurs in both P and Q
(B) Solvus is absent in both P and Q
(C) Solvus occurs in P but not in Q
(D) Solvus occurs in Q but not in P

**Common Data for Questions 50 and 51**:

The following figure gives Mohr envelope for a rock and Mohr circle in a particular stress condition. Fracturing occurs when the Mohr circle touches the Mohr envelope at B.




Q.50 What type of fractures will develop in the rock?

(A) Extension fractures
(B) Conjugate shear fractures
(C) Columnar fractures
(D) Hybrid extension-shear fractures

Q.51 What is the dihedral angle?

(A) $\theta_1$ (B) $\theta_2$ (C) $\theta_3$ (D) $\theta_4$

## Linked Answer Questions

**Linked Answer Questions 52 and 53:**

Q.52 Copper ore deposit with significant content of molybdenum occurs in

(A) thin layers of shale
(B) basic-ultrabasic rocks
(C) volcanogenic (rhyolitic) sedimentary rocks
(D) andesite porphyry

Q.53 An example of the above type of copper deposit is

(A) Kupfersciefer, Germany (B) Chuquicamata, Chile
(C) Kurroko, Japan (D) Sudbury, Canada

**Statement for Linked Answer Questions 54 and 55:**

Microfossils are widely used in palaeoceanographic studies.

Q.54 Which of the following microfossil groups is generally found in deep sea below the Carbonate Compensation Depth?

(A) Foraminifera (B) Radiolaria
(C) Cocoliths (D) Ostracods

Q.55 What is the test composition of the microfossil group identified above?

(A) Carbonate (B) Phosphate
(C) Nitrate (D) Siliceous

**END OF SECTION 1 OF PART B**

## PART B (SECTION 2): FOR GEOPHYSICS CANDIDATES ONLY

## Q. 26 to Q. 55 carry two marks each.

Q.26 The average magnetic susceptibility of dolerite is 1400. What is its magnetic permeability in h/m? (Give answer up to 5 decimal places)

(A) 0.00176 (B) 0.00211 (C) 0.00302 (D) 0.00354

Q.27 A small scale seismic reflection survey was conducted with a shot point located at the middle of a 500 m long geophone spread. The NMO-corrected travel times at the end of the spread were found to be 1.227 s and 1.255 s. If the average seismic wave velocity above the reflector is 2500 m/s, what is the dip of the reflector? (Give the value in degrees in nearest integer)

(A) 4 (B) 6 (C) 8 (D) 10

Q.28 The S-wave velocity in the lower continental crust is 6800 m/s and its density is 3380 kg/m$^3$. Find its rigidity in GPa. (Give answer up to 2 decimal places)

(A) 156.29 (B) 160.21 (C) 162.34 (D) 164.11

Q.29 Given the frequency of an electromagnetic wave to be 1 kHz and ground conductivity to be 10 S/m, calculate the skin depth. (Give answer in nearest integer, in meters)

(A) 2 (B) 3 (C) 5 (D) 8

Q.30 Based on acoustic log of a well, the transit time in a water-bearing sandstone zone is found to be 75 μs/ft. The transit time of acoustic wave through the sandstone matrix and water are 50 μs/ft and 200 μs/ft, respectively. Determine the porosity of the sandstone. (Give answer up to 2 decimal places)

(A) 0.05 (B) 0.10 (C) 0.12 (D) 0.17

Q.31 In frequency domain IP method, frequency effect is defined as

(A) $(\rho_{ac} - \rho_{dc}) / \rho_{dc}$ (B) $(\rho_{ac} - \rho_{dc}) / \rho_{ac}$
(C) $(\rho_{dc} - \rho_{ac}) / \rho_{dc}$ (D) $(\rho_{dc} - \rho_{ac}) / \rho_{ac}$

Q.32 The bright spot on a seismic reflection section in a sand-shale sequence can be seen over

(A) fresh water-bearing sand (B) saline water-bearing sand
(C) oil pool (D) gas pool

Q.33 The line joining the north and south magnetic dip poles misses the Earth's centre by about (in km)

(A) 1000 (B) 1100 (C) 1200 (D) 1300

Q.34 For a three-layered earth with resistivities $\rho_1$, $\rho_2$, and $\rho_3$, and corresponding thicknesses $h_1$, $h_2$, and $h_3$ respectively, the quantity $(h_1/\rho_1) + (h_2/\rho_2) + (h_3/\rho_3)$ stands for

(A) longitudinal conductance (B) transverse resistance
(C) apparent conductance (D) apparent resistance

Q.35 The distance between the centre of the Earth and the barycentre (i.e. centre of mass of the Earth-Moon system) is (in km)

(A) 4510 (B) 4670 (C) 4810 (D) 4860

Q.36 The change in gravity caused by Earth's tides on the land surface in a complete tidal cy range of (in milligal)

(A) 0.1 to 0.2
(B) 0.2 to 0.3
(C) 0.3 to 0.4
(D) 0.4 to 0.5

Q.37 Terrestrial heat flow is the product of

(A) thermal diffusivity and temperature
(B) thermal conductivity and temperature
(C) thermal diffusivity and temperature gradient
(D) thermal conductivity and temperature gradient

Q.38 According to Archie's equation, the electrical resistivity of porous sandstone doesn't depend on:

(A) porosity
(B) nature of interstitial fluid
(C) tortuosity of pores
(D) solid matrix

Q.39 Match the items in **Group I** with those in **Group II.**

| **Group I** | **Group II** |
|---|---|
| P. Magnetic susceptibility | 1. Gyromagnetic ratio |
| Q. Airborne magnetic survey | 2. Axial dipole |
| R. Geomagnetic field | 3. Diamagnetism |
| S. Proton precession magnetometer | 4. Total field intensity |
| | 5. Poisson's relation |

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

Q.40 The NMO of a diffraction hyperbola as compared to that of a reflection hyperbola is

(A) always greater
(B) always smaller
(C) random
(D) same

Q.41 Which one of the following can be determined from the NMR log against sandstone?

(A) Clay content of sandstone
(B) Total porosity
(C) Water-filled porosity
(D) Structured water

Q.42 The peak in the response curves obtained from a geophone exhibits

(A) shift to lower frequency with increasing damping coefficient
(B) shift to higher frequency with increasing damping coefficient
(C) no shift in frequency with increasing damping coefficient
(D) increase in amplitude with increasing damping coefficient

Q.43 The solution to the purely under-determined problem Gm = d is given by

(A) $(G^TG)^{-1}G^Td$
(B) $(G^TG)^{-1}Gd^T$
(C) $G^T(GG^T)^{-1}d$
(D) $G^Td(GG^T)^{-1}$

Q.44 Given the following matrix equation:

$A_{m\times n}\ X_{x\times 1} = b_{m\times 1}$,

the nature of this system of equation is

(A) over-determined if m > n
(B) under-determined if m < n
(C) even-determined if m = n
(D) determined by the rank of the matrix A

Q.45 Match the items in **Group I** with those in **Group II.**

| **Group I** | **Group II** |
|---|---|
| P. $10^{-4}$ to 1 Hz | 1. VLF |
| Q. 400 to 2000 Hz | 2. GPR |
| R. 20 kHz to 25 kHz | 3. MT |
| S. 25 MHz to 1.2 GHz | 4. Slingram |

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

Q.46 Gamma-gamma log applied for estimation of formation density uses incident rays with energy in the range of 0.5 MeV to 2.0 MeV. The interaction of such gamma rays with rocks is governed by

(A) photoelectric absorption
(B) Compton scattering
(C) pair production
(D) secondary emission of gamma rays

Q.47 Determine the correctness or otherwise of the following **Assertion [a] and Reason [r]**.

**Assertion:** In a well-log survey using fresh-water drilling mud, an oil-bearing sandstone zone can be identified by electrical resistivity and SP logs.

**Reason:** Oil has high electrical resistivity and the porous nature of sandstone is indicated by negative SP.

(A) [a] is true but [r] is false
(B) [a] is false but [r] is true
(C) both [a] and [r] are true but [r] is not the correct reason for [a]
(D) both [a] and [r] are true and [r] is the correct reason for [a]

## Common Data Questions

**Common Data for Questions 48 and 49:**

A signal having duration of 10 seconds is sampled at a rate of 1000 samples per second. The maximum frequency of the sampled signal is 475 Hz.

Q.48 If the signal has been under-sampled, the maximum frequency (in Hz) of the original signal would have been

(A) 475 (B) 500 (C) 525 (D) 550

Q.49 What is the frequency interval (in Hz) at which the spectrum of the above signal is evaluated?

(A) 0.08 (B) 0.10 (C) 0.12 (D) 0.14

**Common Data for Questions 50 and 51:**

In a sequence of equally thick layers in the subsurface, normally incident reflection coefficients at th interfaces are: 0.10, 0.15 and 0.18.

Q.50 The amplitude of primary reflection from the deepest interface is

(A) 0.184 (B) 0.174 (C) 0.165 (D) 0.156

Q.51 The amplitude of the surface multiple that arrives along with the reflection from the deepest interface is

(A) 0.008 (B) 0.005 (C) 0.003 (D) 0.001

## Linked Answer Questions

**Statement for Linked Answer Questions 52 and 53:**

A thick section of clean sand is identified on a suite of geophysical logs. The deep laterolog reads 4 Ohm-m in the upper part of the section and 0.1 Ohm-m in the lower part of the section. The lower part is interpreted to be 100% water-saturated. The resistivity of formation water obtained from SP log is estimated to be 0.01 Ohm-m.

Q.52 The formation resistivity factor of the clean sand section is

(A) 8 (B) 10 (C) 12 (D) 14

Q.53 Based on the above result, the water saturation in the top part of the sand formation is

(A) 0.125 (B) 0.158 (C) 0.165 (D) 0.184

**Statement for Linked Answer Questions 54 and 55:**

The seismic slip of a fault after an earthquake is measured to be 0.5 m and the fault area is estimated to be 250 $km^2$. The rigidity of the medium surrounding the fault is 30 GPa.

Q.54 The seismic moment (in Nm) of the earthquake is

(A) $3.75 \times 10^{18}$ (B) $3.75 \times 10^{16}$ (C) $3.75 \times 10^{14}$ (D) $3.75 \times 10^{12}$

Q.55 Based on the above, the moment magnitude of the earthquake is

(A) 5.15 (B) 5.36 (C) 6.35 (D) 7.25

**END OF SECTION 2 OF PART B**

## General Aptitude (GA) Questions

### Q. 56 – Q. 60 carry one mark each.

Q.56 Which one of the following options is the closest in meaning to the word given below?

**Pacify**

(A) Excite (B) Soothe (C) Deplete (D) Tire

Q.57 Choose the most appropriate pair of words from the options given below to complete the following sentence:

**The high level of ___ of the questions in the test was ___ by an increase in the period of time allotted for answering them.**

(A) difficulty, compensated
(B) exactitude, magnified
(C) aptitude, decreased
(D) attitude, mitigated

Q.58 Choose the grammatically **CORRECT** sentence:

(A) He laid in bed till 8 o'clock in the morning.
(B) He layed in bed till 8 o'clock in the morning.
(C) He lain in bed till 8 o'clock in the morning.
(D) He lay in bed till 8 o'clock in the morning.

Q.59 Which one of the parts (A, B, C, D) in the sentence contains an **ERROR**?

**No sooner had the doctor seen the results of the blood test, than he suggested the patient to see the specialist.**

(A) no sooner had
(B) results of the blood test
(C) suggested the patient
(D) see the specialist

Q.60 Ten teams participate in a tournament. Every team plays each of the other teams twice. The total number of matches to be played is

(A) 20 (B) 45 (C) 60 (D) 90

### Q. 61 - Q. 65 carry two marks each.

Q.61 A value of $x$ that satisfies the equation $\log x + \log (x - 7) = \log (x + 11) + \log 2$ is

(A) 1 (B) 2 (C) 7 (D) 11

Q.62 Let $f(x) = x - [x]$, where $x \geq 0$ and $[x]$ is the greatest integer not larger than $x$. Then $f(x)$ is a

(A) monotonically increasing function
(B) monotonically decreasing function
(C) linearly increasing function between two integers
(D) linearly decreasing function between two integers

Q.63 Ravi is taller than Arun but shorter than Iqbal. Sam is shorter than Ravi. Mohan is shorter than Arun. Balu is taller than Mohan and Sam. The tallest person can be

(A) Mohan (B) Ravi (C) Balu (D) Arun

Q.64 A smuggler has 10 capsules in which five are filled with narcotic drugs and the rest contai original medicine. All the 10 capsules are mixed in a single box, from which the customs offi picked two capsules at random and tested for the presence of narcotic drugs. The probability tha the smuggler will be caught is

(A) 0.50 (B) 0.67 (C) 0.78 (D) 0.82

Q.65 **The documents expose the cynicism of the government officials – and yet as the media website reflects, not a single newspaper has reported on their existence.**

Which one of the following inferences may be drawn with the greatest accuracy from the above passage?

(A) Nobody other than the government officials knew about the existence of the documents.
(B) Newspapers did report about the documents but nobody cared.
(C) Media reports did not show the existence of the documents.
(D) The documents reveal the attitude of the government officials.

**END OF THE QUESTION PAPER**

# GATE 2012 - Answer Key - Paper : GG

| Paper | Question no. | Section 1 | Section 2 |
|---|---|---|---|
| GG | 1 | A | A |
| GG | 2 | C | C |
| GG | 3 | D | D |
| GG | 4 | B | B |
| GG | 5 | C | C |
| GG | 6 | A | A |
| GG | 7 | B | B |
| GG | 8 | C | C |
| GG | 9 | B | B |
| GG | 10 | A | A |
| GG | 11 | D | D |
| GG | 12 | D | D |
| GG | 13 | Marks to All | Marks to All |
| GG | 14 | D | D |
| GG | 15 | D | D |
| GG | 16 | D | D |
| GG | 17 | Marks to All | Marks to All |
| GG | 18 | C | C |
| GG | 19 | D | D |
| GG | 20 | B | B |
| GG | 21 | Marks to All | Marks to All |
| GG | 22 | A | A |
| GG | 23 | A | A |
| GG | 24 | B | B |
| GG | 25 | C | C |
| GG | 26 | 0.4 | 0.00173 to 0.00179 |
| GG | 27 | 10 | 7.5 to 8.5 |
| GG | 28 | 100 | 156 to 157 |
| GG | 29 | 1 | 5 |
| GG | 30 | 2 | 0.16 to 0.17 |
| GG | 31 | B | D |
| GG | 32 | C | D |
| GG | 33 | A | C |
| GG | 34 | A | A |
| GG | 35 | B | B |
| GG | 36 | C | B |
| GG | 37 | D | D |
| GG | 38 | A | D |
| GG | 39 | D | A |
| GG | 40 | B | A |
| GG | 41 | B | C |
| GG | 42 | C | A |
| GG | 43 | C | C |
| GG | 44 | A | D |
| GG | 45 | D | B |

# GATE 2012 - Answer Key - Paper : GG

| Paper | Question no. | Section 1 | Section 2 |
|---|---|---|---|
| GG | 46 | B | B |
| GG | 47 | C | D |
| GG | 48 | D | C |
| GG | 49 | C | B |
| GG | 50 | D | B |
| GG | 51 | A | D |
| GG | 52 | D | B |
| GG | 53 | B | B |
| GG | 54 | B | A |
| GG | 55 | D | C |
| GG | 56 | B | B |
| GG | 57 | A | A |
| GG | 58 | D | D |
| GG | 59 | C | C |
| GG | 60 | D | D |
| GG | 61 | D | D |
| GG | 62 | C | C |
| GG | 63 | C | C |
| GG | 64 | C | C |
| GG | 65 | D | D |