GANPAT UNIVERSITY

M.Sc. First Semester Examination (C.B.C.S) Nov-Dec, 2012

Subject: Geophysics

Paper: GPA 101 EOG Elements of Geology.

Time: 3 hours Total Marks: 70

Instructions:

1) Attempt any three questions from each section, of which question No. 4 and 8 are compulsory
2) Answer each section in separate answer book.

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## SECTION: I

| | | |
|---|---|---|
| Q-1 | (A) Explain the conditions existing in the interior of the earth. | 07 |
| | (B) Write a brief note on geological time scale. | 07 |
| Q-2 | (A) Define the term mineral and describe the physical properties of streak and fracture. | 07 |
| | (B) Write a note on hardness of minerals. | 07 |
| Q-3 | (A) Write a note on granitic texture. | 07 |
| | (B) Explain textures, structures and mode of occurrence of igneous rocks. | 07 |
| Q-4 | 1. Hematite gives _____streak. | 01 |
| | 2. Give the difference between Lava and Magma. | 01 |
| | 3. Give the example of Plutonic rocks. | 01 |
| | 4. Give the name of agents of weathering. | 01 |
| | 5. Describe term Scree. | 01 |
| | 6. What is Denudation? | 01 |
| | 7. Give the equation of Specific Gravity | 01 |

## SECTION: II

| | | |
|---|---|---|
| Q-5 | (A) Describe conglomerate and limestone. | 07 |
| | (B) Discuss mechanism of folding. | 07 |
| Q-6 | (A) Discuss Textures of Metamorphic rocks | 07 |
| | (B) Define the term dip and strike and discuss types of dip. | 07 |
| Q-7 | (A) Describe normal and reverse faults. | 07 |
| | (B) Define the term Joints and discuss types of Joints. | 07 |
| Q-8 | 1. Shale is a _____ type of sedimentary rock. | 01 |
| | 2. Marble is chiefly composed of _____ mineral. | 01 |
| | 3. Describe term Local Unconformity. | 01 |
| | 4. Describe term Fault Breccia. | 01 |
| | 5. Name the structures of metamorphic rocks. | 01 |
| | 6. When the fault plane is vertical heave and hade are? | 01 |
| | 7. Describe term Isoclinal Fold. | 01 |

--------END OF PAPER--------

GANPAT UNIVERSITY
M Sc First Semester Examination, December 2012

102
Subject: Solid Earth Geophysics

Time: 3 hours Total marks: 70

Instructions:

i) Attempt any three questions from each section, of which No.4 and 8 are compulsory.
ii) Each question carries equal marks, 7 marks each for (a) and (b), and 1 mark each from (i) to (vii) in Q4 and Q8, respectively.

## Section I

Q.1
(a) Give a short description of chemical composition of the Earth. — 07
(b) Give an overview of magnetic and gravity anomalies over major tectonic zones in peninsular India. — 07

Q.2
(a) State Kepler's law of planetary motion. — 07
(b) Give a short account of temperature distribution inside the Earth. — 07

Q.3
(a) Give a short account of polar wanderings. — 07
(b) Briefly describe the origin of geomagnetic field. — 07

Q.4
(i) What is the approximate age of the Earth? — 01
(ii) What is the average geothermal gradient in the crust? — 01
(iii) What is the main constituent in the inner core of the Earth? — 01
(iv) What is the unit of geomagnetic field? — 01
(v) What is the average Q value of the crust? — 01
(vi) What is the controlling factor for diurnal variation of the geomagnetic field? — 01
(vii) What is the unit of heat flow? — 01

## Section II

Q.5.
(a) Give a short account on the concept of isostacy. — 07
(b) Briefly discuss the electrical conductivity of crustal rocks. — 07

Q.6
(a) Give a brief overview on the geodynamics of Indian subcontinent. — ७
(b) Give a short account of the seismic discontinuities and Earth's internal structure. — ७

Q.7
(a) With a neat diagram describe different seismic phases that may be recorded by a seismograph due to a local earthquake. — ७
(b) How radioactivity is used in dating of rocks and in exploration? — ७

Q.8
(i) What is an average thickness of the lithosphere? — ०१
(ii) What is an average value of Vp/Vs of the crust? — ०१
(iii) PKP phase is reflected from which boundary of the Earth? — ०१
(iv) In what type of plate boundary volcanic activity is observed? — ०१
(v) Earthquake mechanisms are understood based on which theory? — ०१
(vi) What is the scale that is used to evaluate earthquake intensity? — ०१
(vii) What is the geological evidence for paleoseismicity? — ०१

— X —

GANPAT UNIVERSITY

M.Sc. First Semester Examination (C.B.C.S) Nov-Dec, 2012

Subject: Geophysics

Paper: GPA 103 GAS Geoexploration and Surveying

Time: 3 hours Total Marks: 70

Instructions:

1) Attempt any three questions from each section, of which question No. 4 and 8 are compulsory
2) Answer each section in separate answer book.

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## SECTION: I

Q-1 Mention all types of Geophysical surveys and their basic principles? 14

Q-2 Explain the basic principle behind electrical geophysical survey? Explain the difference between profiling and sounding. Give the dipole diagram for Wenner and Schlumberger electrode configurations? 14

Q-3 Explain the basic principle of seismic method and the phenomena of reflection and refraction with diagram. Explain in detail the two layered reflection problem? 14

Q-4

1. Which Electrical dipole configuration is used for electric profiling? 01
2. Write the relationship between resistivity and resistance. 01
3. Which property is measured by magnetic method? 01
4. Which property is measured through electrical method? 01
5. What is the unit of electrical resistivity? 01
6. Which property is measured through gravity method? 01
7. Which method is the best method for ground water exploration? 01

## SECTION: II

Q-5 Mention the application of the following geophysical methods:- 14

i) Seismic method ii) Gravity method
iii) Electrical method iv) Electromagnetic method
v) Magnetotelluric method

Q-6 i) Explain any two types of Electromagnetic methods with principles. 14
ii) Mention any two geophysical methods that can be applied for engineering structure design and how?

Q-7 Explain the principle behind Magnetotelluric survey? Explain the layout plan with diagram of Magnetotelluric survey field deployment? 14
i) What is skin depth? Find the skin depth if
ii) Resistivity ($\rho$)= 40$\Omega$-m and Frequency (f)= 20 Hz
iii) Calculate resistivity ($\rho$) if skin depth = 50m, frequency =100 Hz

Q-8

1. Name one Active Geophysical method 01
2. Name one Passive Geophysical method 01
3. Mention the basic phenomenon behind electromagnetic method 01
4. What is the source of Magnetotelluric signal below Below 1 Hz 01
5. What is the value of resistivity along a fault or fracture? 01
6. What is the source of Magnetotelluric signal below above1 Hz 01
7. Which property is measured through Time Domain electromagnetic method? 01

--------END OF PAPER--------

GANPAT UNIVERSITY

M.Sc. First Semester Examination (C.B.C.S) Nov-Dec, 2012

Subject: **Fundamentals of Physics & Mathematics**

Paper: **GPA 104 FPM**

Time: 3 hours Total Marks: 70

Instructions:

1) Attempt any three questions from each section, of which question No. 4 and 8 are compulsory
2) Answer each section in separate answer book.

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## SECTION: I

Q-1 A. Explain polarization of light with appropriate diagram. 14

B. Write a short note on dispersion of light.

Q-2 A. State coulomb's law and explain it briefly. 14

B. Explain Newton's law of gravitation.

Q-3 A. Derive an equation for half life of radioactive substance. 14

B. Explain wave particle duality.

Q-4 **Fill in the blanks.** 07

1. As frequency of a wave increases energy of the wave_____.
2. Unit of gravitational force is _____.
3. Electric charge of alpha particle is_____.
4. Penetration power of gamma ray is _____.
5. Beta particles deviate towards _____in the electric field.
6. Unit of electric potential is _____.
7. Unit of electric field is_____

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## Section – II

**Que: 5** (14)

(A) (1) If $A = \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$ then find $A^{-1}$ by using Gauss – Jordan method.

(2) Test for convergence of the series by D'Alemberts' test : $\sum \frac{2^n \, n!}{n^n}$

(B) Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 5 & 7 \end{bmatrix}$

(C) Solve: $x + y + z = 3$, $x + 2y + 3z = 4$, $x + 4y + 9z = 6$

**Que: 6** (14)

(A) Expand the polynomial $x^3 + 7x^2 - x + 32$ in power of $(x - 3)$

(B) Find the extreme value of $f(x, y) = x^2 + y^2 + xy + x - 4y + 5$

(C) Verify the Green's theorem for $\int [(xy + y^2)dx + x^2dy]$ region is bounded by $y = x$ & $y = x^2$

**Que: 7** (14)

(A) If $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ & $P(A \cap B) = \frac{1}{6}$ then find $P(A')$, $P(B')$, $P(A \cup B)$ and $P(A' \cap B')$.

(B) A ball is drawn at random from a box containing 6 white, 4 black & 5 red balls. Find the probability that the ball drawn is (i) white (ii) red (iii) black (iv) white or black

(C) Define Del ($\nabla$) and gradiant of scalar function. Find $\nabla f$ for $f(x, y, z) = x^3 + y^3 + z^3 + 3xyz$

**Que: 8** (7)

For studying a characteristic the observations of a population are 2, 5, 8, 9
How many samples of size 2 with replacement can be taken from it? Making a list of all the samples and verify the given result $E(\bar{x}) = \bar{y} = \mu$ & find $Var(\bar{x})$.

**END OF PAPER**

GANPAT UNIVERSITY
M.Sc. First Semester Examination (C.B.C.S) Nov-Dec, 2012
Subject: Geophysics
Paper: GPB 105 LCS Language and Communication skills-I

Time: 3 hours | Total Marks: 70

Instructions:
1) Attempt any three questions from each section, of which question No. 4 and 8 are compulsory
2) Answer each section in separate answer book.

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## SECTION-I

**Q-1 Attempt the following:** **14**

1) Discuss Modes of mass communication.
2) Discuss language barriers to communication.

**Q-2 Write short notes on the following:** **14**

1) Visual and auditory symbols.
2) 7 Cs of effective communication

**Q-3 Write short notes on the following:** **14**

1) Verbal communication.
2) Discuss modes of listening.

**Q-4 Do as directed:** **07**

**(a) Fill in the blanks with appropriate forms of verbs:** **04**

1. The quality of goods _____ not as per the standard. (Am, Is, Are)
2. *Arabian Nights* _____ great children classic. (Am, Is, Are)
3. Either he or I _____ made mistake. (Have, Has)
4. Every boy and every girl _____ scored well in exam. (Have, Has)

**(b) Convert the following sentences into passive voice:** **03**

1. He is driving car.
2. Mukesh has written good poem.
3. I will do hard work.

## Section -II

**Q-5 Attempt the following:** **14**

1) What is reading? Discuss techniques for effective reading comprehension.
2) Discuss paralinguistic features of an effective speaking..

**Q-6 Write short notes on the following:** **14**

1) Modified Block form and Demi Official form of layout.
2) Discuss significance of written communication for professionals.

**Q-7 Write letters on the following:** **14**

1) As an owner of a readymade garment showroom you want to purchase 100 jeans and 250 XL size shirts of various brands. Write an order letter to the dealer for the purpose.
2) For the delivery of defective furniture you have received a complaint from your valuable customer. Write an adjustment letter to the complainant.

**Q-8 Answer the following questions:** **07**

1) List different reading strategies.
2) List different paralinguistic features of speaking.
3) Give full form of SQ3R.
4) Can open punctuation be used in 'indented form' of layout?
5) What is the full form of NOMA?
6) What is the full form of BFG?
7) List different layout of business letters.

-------END OF PAPER-------