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**M.Sc. – I (Semester – I) (New – CBCS) Examination, 2016**  
**APPLIED GEOLOGY (Paper – I)**  
**Mineralogy and Optics**

Day and Date : Tuesday, 29-3-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) Answer **five** questions.
  - 2) Question No. **I** is **compulsory**.
  - 3) Answer **any two** question from Q.No. **II, III and IV**.
  - 4) Answer **any two** question from Q. No. **V, VI and VII**.
  - 5) **All** questions carry **equal** marks.
  - 6) **Draw** neat diagrams **wherever** necessary.

I. Choose the correct answer for the following :

14

- 1) Which of the following is an isotropic mineral ?  
a) Hornblende    b) Almandine    c) Beryl    d) Epidote
- 2) Orthorhombic, monoclinic and triclinic minerals are optically.  
a) Uniaxial    b) Biaxial    c) Triaxial    d) None
- 3) Crystabolite is a variety of  
a) Feldspar    b) Garnet    c) Quartz    d) Amphibole
- 4) The angle measured between the two optic axis for the minerals of orthorhombic, monoclinic and triclinic is termed as  
a) R.I.    b) 2V    c) Interfacial angle    d) None
- 5) Find the odd one out  
a) Olivine    b) Garnet    c) Nepheline    d) Galena
- 6) Which of the following does not belong to zeolite group ?  
a) Natrolite    b) Cavansite    c) Stilbite    d) Sanidine
- 7) Beckeline effect under microscope helps to know relative  
a) Hardness    b) Density    c) Flash figures    d) Refractive index
- 8) Which one of the following is not of olivine group ?  
a) Forestrite    b) Fayalite    c) Montmorillonite    d) Hortonolite

P.T.O.



- 9) Quartz wedge, mica plate and gypsum plate are the accessories used in determination of
- a) Optic sign    b) Length fast    c) Length slow    d) All the above
- 10) Determination of 2V is possible in mineral
- a) Galena    b) Diamond    c) Calcite    d) Olivine
- 11) Which of the following exhibits piezoelectricity, uniaxial and hardness ?
- a) Quartz    b) Beryl    c) Moonstone    d) Scapolite
- 12) Find the odd one out
- a) Kaolinite    b) Montmorillonite  
c) Bentonite    d) Muscovite
- 13) Feldspar minerals show following twinning.
- a) Albite    b) Baveno    c) Manebach    d) All the above
- 14) The sum of XYZ charges of the general formula of the pyroxene group expressed as  $X_{1-P}Y_{1+P}Z_2O_6$  is
- a) 4    b) 6    c) 12    d) 14

II. What is 2V angle in biaxial minerals ? Discuss various methods in determining 2V of biaxial minerals.

III. Bring out the salient aspects of structure, chemistry and paragenesis of dioctahedral and trioctahedral micas.

IV. Illustrate how chemistry and optical properties of minerals are inter related. with suitable examples.

V. Write short notes on the following :

- a) Alteration products of olivine  
b) Flash figures.

VI. Write short notes on the following :

- a) Structure of amphibole  
b) Nomenclature of pyroxene.

VII. Write briefly on the following :

- a) Uniaxial and biaxial ellipsoid.  
b) Structure and paragenesis of garnet minerals.
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**M.Sc. – I (Semester – I) (New) (CBCS Pattern) Examination, 2016  
APPLIED GEOLOGY (Paper – II)  
Igneous and Metamorphic Petrology**

Day and Date : Thursday, 31-3-2016

Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions:** 1) Answer **five** questions.  
2) **All** questions carry **equal** marks.  
3) Question **I** is **compulsory**.  
4) Answer **any two** questions from Q. **II, III and IV** and **any two** questions from Q. **V, VI and VII**.  
5) Draw **neat** and labelled diagrams **wherever** necessary.

I. Choose the correct answer for the following :

14

- 1) The presence of hypersthene in granulite is the termination of
  - a) Low grade regional metamorphism
  - b) High grade regional metamorphism
  - c) Low grade thermal metamorphism
  - d) High grade thermal metamorphism
- 2) The partially fused hornfels rocks occurring as xenoliths, usually in basalt or diabase as a product of pyrometamorphism is
  - a) Schist
  - b) Buchites
  - c) States
  - d) Gneisses
- 3) In which metamorphic facies the eastern ghat rocks – khondalite and charnockite-belong
  - a) Zeolite
  - b) Amphibolite
  - c) Granulite
  - d) Hornfels
- 4) Find the odd one out
  - a) Glaucophane-blueschist
  - b) Omphacite-eclogite
  - c) Spessartite-gondite
  - d) Kyanite-zeolite
- 5) Which of the metamorphic facies does not belong to progressive regional metamorphism.
  - a) Zeolite
  - b) Greenschist
  - c) Hornfels
  - d) Granulite



- 6) Which metamorphic facies occur in post-Paleozoic orogenic belts.  
 a) Greenschist      b) Blue schist      c) Eclogite      d) Hornfels
- 7) Pallavaram is the type area for  
 a) Carbonatite      b) Khondalite      c) Charnockite      d) None
- 8) The Aluminium Saturation Index (ASI) is calculated in a igneous rock by taking the ratio of  
 a)  $\text{Al}_2\text{O}_3 / \text{FeO} + \text{Fe}_2\text{O}_3$       b)  $\text{Al}_2\text{O}_3 / \text{CaO} + \text{K}_2\text{O} + \text{Na}_2\text{O}$   
 c)  $\text{Al}_2\text{O}_3 / \text{SiO}_2$       d)  $\text{Al}_2\text{O}_3 / \text{TiO}_2$
- 9) In which tectonic setting calc-alkaline magma is generated  
 a) Subduction zone      b) Continental rift      c) Ocean rift      d) None
- 10) The product of alkali metasomatism result to a rock.  
 a) Phonolite      b) Finite      c) Pegmatite      d) All the above
- 11) Find the odd one out.  
 a) Gateway of India – Basalt      b) Taj Mahal – Makarana marble  
 c) Konark temple – Khondalite      d) Golgumbaz – Oolitic limestone
- 12) The term MORB is related to  
 a) Buchites      b) Basalts      c) Marble types      d) None
- 13) the highest topographic point in the deccan province is at  
 a) Satara peak      b) Ajanta peak  
 c) Kalsubai peak      d) Amar Kantak point
- 14) Which one of the following is a volcanic tuffs.  
 a) Andesite      b) Ignimbrite      c) Pegmatite      d) None
- II. Bring out the salient aspects of the role of plate tectonics in magnetism and metamorphism. **14**
- III. Give Eskola's classification of regional metamorphic facies. Add a note on the index minerals and P&T of formation of metamorphic facies. **14**
- IV. What is differentiation ? Explain various processes of magmatic differentiation. **14**
- V. Write short notes on the following : **14**  
 a) Kimberlite      b) Hornfels
- VI. Bring out the salient aspects on the following. **14**  
 a) Carbonatites      b) Glaucophane schist facies
- VII. Discuss briefly on the following : **14**  
 a) Borrowian zones of metamorphism      b) I-type and S-type granites
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**M.Sc. I (Semester – I) Examination, 2016  
(CBCS) (New) (Paper – III)  
APPLIED GEOLOGY  
Sedimentology and Palaeontology**

Day and Date : Saturday, 2-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question **1** is **compulsory**.
  - 4) Answer **any two** questions from **each** Section **A** and Section **B**.
  - 5) Draw **neat** and labeled diagram **wherever** necessary.

I. Multiple choice question :

14

- 1) A quartz sandstone is said “mature” when it is having
  - a) Well-rounded, poor-sorted quartz grains
  - b) Poor-rounded, poor-sorted quartz grains
  - c) Well-rounded, well-sorted quartz grains
  - d) Poor-rounded, well-sorted quartz grains
- 2) Dinosaurs are reported from the rocks of
  - a) Paleozoic group
  - b) Tertiary group
  - c) Mesozoic group
  - d) All of the above
- 3) Name the most abundant chemically or biochemically precipitated rock
  - a) Limestone
  - b) Gypsum
  - c) Rock salt
  - d) Chert
- 4) It is found in the floor of Atlantic ocean. At many places it (ocean floor) is covered by Oozes. What is the name of these Oozes ?
  - a) Diatoms
  - b) Globigerina
  - c) Dinoflagellate
  - d) Silicoflagellate



- 5) Deep sea Oozes are composed of
- a)  $\text{SiO}_2$  only
  - b)  $\text{CaCO}_3$
  - c)  $\text{SiO}_2$  and  $\text{CaCO}_3$
  - d)  $\text{SO}_4$  and  $\text{CaCO}_3$
- 6) The land of “Living Fossil” is
- a) Andaman Nicobar
  - b) Africa
  - c) Antarctica
  - d) Australia
- 7) Asymmetrical current ripple marks are formed due to
- a) Wave action
  - b) Current action
  - c) Both water and current actions
  - d) Combined action of wave and current action
- 8) Delthyrium is found in which class of Brachiopods
- a) Inarticulata
  - b) Articulata
  - c) Both of the above
  - d) None of the above
- 9) Current beddings are formed due to
- a) Frequent changes in velocity of the flow of the stream
  - b) Frequent changes in direction of the flow of the stream
  - c) Frequent changes in velocity and direction of the flow of the stream
  - d) None of these
- 10) Which of these is an inarticulate brachiopod
- a) Spirifer
  - b) Rhynchonella
  - c) Terebratula
  - d) None of the above
- 11) Graded bedding is characterized by
- a) Coarse grains at bottom and fine grains at top
  - b) Coarse grains at top and fine grains at bottom
  - c) Same grain size distribution
  - d) Mixture of coarse and fine grains
- 12) Ceratitic suture is prevalent in the forms found in
- a) Permian
  - b) Triassic
  - c) Permian to Triassic
  - d) Cretaceous



- 13) A light coloured sandstone containing at least 25% feldspar is called
- a) Orthoquartzite
  - b) Graywacke
  - c) Arkose
  - d) None of the above
- 14) Porosity and permeability are \_\_\_\_\_ properties of a sedimentary rock.
- a) Primary
  - b) Secondary
  - c) Related
  - d) All the above

#### SECTION – A

- II. What are sedimentary texture ? Write about clastic and nonclastic rock textures.
- III. Describe the morphology and evolution of palaeozoic ammonoids.
- IV. What is meant by environmental of deposition ? Give an account of sedimentation in fluvial environment.

#### SECTION – B

- V. Write notes in brief on the following.
- 1) Cross bedding
  - 2) Mesozoic reptiles.
- VI. Discuss in short on.
- 1) Classification of limestone
  - 2) Modes of preservation of fossils.
- VII. Short note on :
- 1) Morphology of Brachiopods
  - 2) Carbonaceous sedimentary rock.
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**M.Sc. – I (Semester – I) (New) (CBCS) Examination, 2016**  
**APPLIED GEOLOGY (Paper – IV)**  
**Structural Geology and Morphotectonics**

Day and Date : Tuesday, 5-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions :** 1) **All** questions carry **equal** marks.  
2) Attempt **five** questions.  
3) Question 1 is **compulsory**.  
4) Answer **any two** questions from questions No. 2, 3 and 4.  
5) Answer **any two** questions from questions No. 5, 6 and 7.  
6) Draw **neat** and labeled diagrams **wherever** necessary.

1. Fill in the blanks with correct choice :

14

- 1) Fold having inclined axis are called \_\_\_\_\_ folds.
  - a) Overturned
  - b) Recumbent
  - c) Plunging
  - d) Isoclinal
- 2) The drainage pattern which has lack of structural control to stream flow direction is described as \_\_\_\_\_.
  - a) Parallel
  - b) Dendritic
  - c) Rectangular
  - d) Trellis
- 3) Spits and tombolo are deposits are encountered in the \_\_\_\_\_.
  - a) Glacial environment
  - b) Fluvial environment
  - c) Deltaic environment
  - d) Marine environment
- 4) Most rivers in Himalayan system are \_\_\_\_\_.
  - a) Antecedent
  - b) Consequent
  - c) Obsequent
  - d) Subsequent
- 5) Gravity fault are formed under \_\_\_\_\_.
  - a) Compressive stress regime
  - b) Tensile stress regime
  - c) Shear stress regime
  - d) Effects of torsional force



- 6) In an asymmetrical syncline the two limbs \_\_\_\_\_
- a) Dip towards each other by same angle
  - b) Dip away from each other by the same angle
  - c) Dip towards each other by different angle
  - d) Dip away from each other by different angle
- 7) An unconformity in which the oldest series of beds parallel to the younger series of beds is called \_\_\_\_\_
- a) Angular unconformity
  - b) Conformity
  - c) Disconformity
  - d) Non conformity
- 8) The concept of uniformitarianism was given by \_\_\_\_\_
- a) James Hutton
  - b) Nicholas Steno
  - c) William Smith
  - d) None of above
- 9) The greatest principal stress axis is vertical in \_\_\_\_\_
- a) Normal fault
  - b) Reverse fault
  - c) Thrust fault
  - d) Strike slip fault
- 10) In karst topography pillar like forms which grow upwards from the cave floor are called \_\_\_\_\_
- a) Stalagmite
  - b) Stalactite
  - c) Stylolites
  - d) Geode
- 11) Natural levee is an example of \_\_\_\_\_
- a) Point bar deposit
  - b) Channel fill deposit
  - c) Alluvial fan deposit
  - d) Flood plain deposit
- 12) Which of the following is not a stratified glacial deposit ?
- a) Kames
  - b) Varves
  - c) Drumlin
  - d) Eskers
- 13) Fold having sharp hinges and smooth sides are termed as \_\_\_\_\_ fold.
- a) Cuspate
  - b) Isoclinal
  - c) Chevron
  - d) Anticline
- 14) The Brahmaputra is an example of \_\_\_\_\_ river.
- a) Consequent
  - b) Subsequent
  - c) Antecedent
  - d) Superposed



2. Describe the erosional and depositional features developed along sea coast. **14**
  3. Give geometric classification of fold and evidences to recognize folds in the field. **14**
  4. Describe the DAVISIAN cycle of erosion for the evolution of landforms. **14**
  5. Write short notes on : **14**
    - a) Horst and Graben
    - b) Classification of Joints.
  6. Write in brief on : **14**
    - a) Glacial landforms
    - b) Strain indicators.
  7. Write notes on : **14**
    - a) Lineament analysis
    - b) Types of Unconformities.
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**M.Sc. – I (Semester – II) Examination, 2016**  
**APPLIED GEOLOGY (Paper – V) (New CBCS)**  
**Economic Geology**

Day and Date : Wednesday, 30-3-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question No. **1** is **compulsory**.
  - 4) Answer **any two** questions from Q.No. **2, 3** and **4** and **two** questions from Q.No. **5, 6** and **7**.
  - 5) Draw **neat** and labeled diagrams **wherever** necessary.

1. Fill in the blanks with correct choice :

- 1) Placer gold is mined by \_\_\_\_\_ method of mining.
  - a) Panning
  - b) Open cast
  - c) Underground
  - d) Stoping
- 2) Copper deposits of Khetri are restricted to the contact of \_\_\_\_\_
  - a) Delhi – Siwaliks
  - b) Aravalli – Delhi
  - c) Ajabgarh – Alwar
  - d) Malani – Delhi
- 3) Kudremukh mine from Karnataka is known for its \_\_\_\_\_ occurrence.
  - a) Copper
  - b) Lead
  - c) Iron
  - d) Zinc
- 4) Pitchblende is the ore of \_\_\_\_\_
  - a) Rh
  - b) Th
  - c) Zr
  - d) U
- 5) Zawar mine is known for its \_\_\_\_\_ deposits.
  - a) Phosphorite
  - b) Zinc
  - c) Copper
  - d) Iron



- 6) Jhamalkotra mine is famous for its \_\_\_\_\_ deposits.  
a) Gold                      b) Silver                      c) Phosphorite                      d) Copper
- 7) Tertiary coal is found in \_\_\_\_\_ basin.  
a) Cuddapah                      b) Gondwana                      c) Damodar                      d) None
- 8) Find the odd man out :  
a) Chalcopyrite                      b) Galena                      c) Sphalerite                      d) Fluorite
- 9) Which one of these is primary ore for zinc ?  
a) Chalcopyrite                      b) Hematite                      c) Galena                      d) Sphalerite
- 10) Ladder vein structure commonly is shown by \_\_\_\_\_ deposits.  
a) Magmatic segregation                      b) Sedimentary  
c) Cavity filled                      d) Evaporites
- 11) The ore is found in supergene sulphide deposit \_\_\_\_\_  
a) Water table                      b) Below water table  
c) Above water table                      d) None of the above
- 12) A mineral which exhibits sublimation is \_\_\_\_\_  
a) Mercury                      b) Sulphur                      c) Cinnabar                      d) Realgar
- 13) Bedded Manganese ores are generally \_\_\_\_\_  
a) Epigenetic                      b) Syngenetic  
c) Paragenetic                      d) Both epigenetic and syngenetic
- 14) In Agnigundala mineralized belt, Andhra Pradesh Pb-Cu-Zn are of \_\_\_\_\_ nature.  
a) Magmatic                      b) Metasomatic  
c) Hydrothermal                      d) Sedimentary
2. Discuss ore deposits associated with magmatic rocks with suitable Indian examples.
3. Define fluid inclusion. Explain in brief its types and applications in geological studies.
4. Write an essay on wall rock alteration as ore forming process.



5. Describe the following :
    - 1) Khetri copper deposits
    - 2) Paragenesis and zoning.
  6. Write short notes on :
    - 1) Ore textures
    - 2) Industrial minerals.
  7. Explain in short the following :
    - 1) Magmatic concentration deposits
    - 2) Controls of mineralization.
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**M.Sc. – I (Semester – II) Examination, 2016  
(CBCS Pattern) (New)  
APPLIED GEOLOGY  
Paper – VI : Indian Stratigraphy**

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question No. **1** is **compulsory**.  
4) Answer **any two** questions from Q.No. **2, 3** and **4**.  
5) Answer **any two** questions from Q.No. **5, 6** and **7**.  
6) Draw **neat** and labelled diagram **wherever** necessary.

1. Choose the correct answer :

- 1) The term 'Arvalli System' was introduced by
  - a) Heron
  - b) King
  - c) Wadia
  - d) Medlikott
- 2) Kimberlite in Vindyan basin is in
  - a) Chelina
  - b) Panna
  - c) Wajrakarur
  - d) All the above
- 3) The youngest group in Cuddapah Basin is
  - a) Kurnool group
  - b) Cheyyair group
  - c) Nallamalai group
  - d) Papaghni group
- 4) Age of Arvalli fold belt is
  - a) Palaeozoic
  - b) Lower Archaean
  - c) Palaeoproterozoic
  - d) None of the above
- 5) Lignite deposit of Neyveli belongs to
  - a) Cuddalore Sandstone
  - b) Chali series
  - c) Warkali beds
  - d) None





- 6) Ajabgarh series' belong to
- a) Bundelkhan gneiss
  - b) Delhi system
  - c) Aravali system
  - d) None of these
- 7) Saucer series is equivalent to
- a) Peninsular Gneiss
  - b) Upper Dharwar
  - c) Middle Dharwar
  - d) Lower Dharwar
- 8) The age of Muth quartzite is
- a) Middle to Late Permian
  - b) Permian
  - c) Early Carboniferous
  - d) Late Silurian to Early Devonian
- 9) The Triassic and Jurassic rocks of the Tethyan Himalaya are predominantly composed of \_\_\_\_\_ facies.
- a) Greenschist facies
  - b) Carbonate facies
  - c) Granulite facies
  - d) Zeolite facies
- 10) Albaka Formation of Godavari basin is equivalent to which of the following formation
- a) Mudhol
  - b) Lokapur
  - c) Bagalkot
  - d) Sonrai
- 11) Alwar Group of rocks are underlain by which of the following group of rocks
- a) Mangalwar Complex
  - b) Ajabgarh Group
  - c) Raiolo Group
  - d) All the above
- 12) The largest unit in the chronostratigraphic unit is
- a) Era
  - b) Epoch
  - c) Series
  - d) System
- 13) Cu-Pb-Zn deposit of Agnigundala mineralised belt of Andhra Pradesh belongs to
- a) Papaghni group
  - b) Cheyyair group
  - c) Nallamalai group
  - d) Kurnool group
- 14) The age of singhbum granite is
- a) 3200 my
  - b) 2000 my
  - c) 2700 my
  - d) 500 my



2. Write detailed note on rise of Himalaya.
  3. Give an account on classification, tectonic and the depositional environment of Vindyan basin.
  4. Discuss in detail Greenstone belts of Eastern Dharwar craton.
  5. Write short note on :
    - a) K.T. Boundary
    - b) Bhima-Kaladgi Basin
  6. Discuss in short :
    - a) Marine Palaeozoic formations of extra peninsular India.
    - b) Archaean-Proterozoic boundary problem.
  7. Explain in brief :
    - a) Origin of Deccan Trap
    - b) Delhi Supergroup.
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**M.Sc. (Part – I) (Semester – II) (New CBCS) Examination, 2016  
APPLIED GEOLOGY (Paper – VII)  
Hydrogeology**

Day and Date : Monday, 4-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question No.1 is **compulsory**
  - 4) Answer **any two** questions from Q.No : **2, 3 and 4.**
  - 5) Answer **any two** questions from Q.No : **5, 6 and 7.**
  - 6) Draw **neat** and labelled diagrams **wherever** necessary.

1. Choose the correct answer.

- 1) The water which has remained out of contact with atmosphere upto present time is known as \_\_\_\_\_
  - a) Juvenile water
  - b) Plutonic water
  - c) Metamorphic water
  - d) Fossil water
- 2) The measurements of drawdown below the original static water level (prior to pumping) during recovery period are known as \_\_\_\_\_
  - a) Residual drawdown
  - b) Alternate drawdown
  - c) Linear drawdown
  - d) Parallel drawdown
- 3) Pan coefficient is given by \_\_\_\_\_
  - a) Pan evaporation/Lake evaporation
  - b) Floating evaporation/Pan evaporation
  - c) Lake evaporation/Pan evaporation
  - d) Pan evaporation/Floating evaporation



- 4) Groundwater flow map is also known as
- a) Isopach map
  - b) Isocontour map
  - c) Potentiometric map
  - d) Flydraulic map
- 5) The average infiltration rate during the time rainfall intensity exceeds the infiltration capacity rate is known as \_\_\_\_\_
- a) W-index
  - b) Fave index
  - c)  $\lambda$  - index
  - d)  $\phi$ -index
- 6) The \_\_\_\_\_ surface, of a confined aquifer is an imaginary surface coinciding with the hydrostatic pressure level of the water in the aquifer.
- a) phreatic
  - b) piezometric
  - c) potentiometric
  - d) b and c both
- 7) A hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers is defined as \_\_\_\_\_
- a) Water reservoir
  - b) Water divide
  - c) Groundwater basin
  - d) Water continuity
- 8) Groundwater contours and Groundwater flow lines are \_\_\_\_\_ to each other.
- a) Parallel
  - b) Perpendicular
  - c) Angular
  - d) Vertical and horizontal
- 9) The soil properties characteristic of good water yield are \_\_\_\_\_
- a) Porosity
  - b) Permeability
  - c) Specific yield
  - d) All of the above
- 10) \_\_\_\_\_ springs results from releases of water under pressure from confined aquifers either at an outcrop of the aquifer.
- a) Depression
  - b) Artesian
  - c) Contact
  - d) Impervious
- 11) \_\_\_\_\_ of a soil or rock is the ratio of the volume of water that after saturation can be drained by gravity to its own volume.
- a) Specific coefficient
  - b) Specific yield
  - c) Specific retention
  - d) None of the above
- 12) If the groundwater table is above water surface elevation in the stream, the groundwater feeds the stream, such stream are called \_\_\_\_\_
- a) Effluent stream
  - b) Influent stream
  - c) Ephemeral stream
  - d) Insulated stream



13) The relation between fresh and saline water given by Ghyben – Herzberg is \_\_\_\_\_

- a)  $Z = hf$                       b)  $Z = 40hf$                       c)  $Hf = 40+Z$                       d)  $Hf/Z = 40$

14) Groundwater contours and groundwater flow lines are \_\_\_\_\_ to each other.

- a) Parallel    b) Perpendicular  
c) Angular    d) Vertical and horizontal

2. Describe different graphic representations of chemical quality of groundwater.
  3. Describe in detail the vertical distribution of groundwater.
  4. Explain the hydraulic cycle in nature with the help of a neat sketch, indicating its various phases.
  5. Write short notes on :
    - a) Classification of streams.
    - b) Transmissivity.
  6. Write briefly on :
    - a) Distinguish between Aquifer and Aquiclude.
    - b) Origin and age of groundwater.
  7. Discuss the following :
    - a) Groundwater pollution.
    - b) Darcy's law.
-





Seat No.	
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**M.Sc. – I (Semester – II) Examination, 2016**  
**APPLIED GEOLOGY**  
**Paper – VIII : Geochemistry (CBCS Pattern) (New)**

Day and Date : Wednesday, 6-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question No. **1** is **compulsory**.  
4) Answer **any two** questions from Q. No. **2, 3 and 4**.  
5) Answer **any two** questions from Q. No. **5, 6 and 7**.  
6) Draw **neat** and labelled diagrams **wherever** necessary.

1. Choose the correct answer:

- 1) The nuclear physicists Burbidge, Burbidge, Fowler and Hoyle had proposed the theory of origin of elements on the basis of
- a) Thermonuclear processes                      b) Radio active decay  
c) Stellar explosion                                d) All the above
- 2) Bi-Modal of  $\text{SiO}_2$  for the igneous rocks is an indication of the major rocks such as
- a) Gabbro and Basalt                                b) Syenite and Gabbro  
c) Basalt and Granite                                d) None
- 3) Chlorinity is determined by precipitation of halides with
- a) HCl    b) Silver nitrate  
c) Hydrochloric acid                                d) None



- 4) One percent of the oxygen of the present day attained during the Precambrian times is
  - a) Lewis point
  - b) Pasteur point
  - c) Du mount point
  - d) None
- 5) The relative concentration of “O” in crust in comparison with its concentration in mantle is
  - a) Higher
  - b) Lower
  - c) Same
  - d) All the above
- 6) The most stable form of manganese in the secondary environment is
  - a) Psilomelane
  - b) Pyrolusite
  - c) Hausmanite
  - d) Manganite
- 7) Goldschmidt has classified sand / quartz as
  - a) Carbonates
  - b) Oxidates
  - c) Resistates
  - d) None
- 8) The concentration of gold is expected to be higher in
  - a) Crust
  - b) Mantle
  - c) Core
  - d) All the above
- 9) The substitution of Hf for Zr under the rules of Goldschmidt is called as
  - a) Capture
  - b) Camouflaged
  - c) Admittance
  - d) None
- 10) The elements with low  $Z/r$  index are those that are
  - a) Soluble
  - b) Insoluble
  - c) Oxides
  - d) Carbonates
- 11) According to the cosmic abundance which of the following element is abundant ?
  - a) Iron
  - b) Carbon
  - c) Silicon
  - d) Hydrogen
- 12) The average composition of igneous rocks was proposed by
  - a) Goldschmidt
  - b) Schonbein
  - c) Clarke and Washington
  - d) None





13) The most important temperature controlling mechanism in atmosphere for the greenhouse effect are caused by

- a) GHG
- b) Carbon-dioxide
- c) Water vapour
- d) All the above

14) The father of geochemistry is

- a) Goldschmidt
- b) Goldich
- c) Washington
- d) Schonbein

II. What are decay clocks ? Give various material in dating decay clocks.

III. What are geochemical fences ? State their merits and demerits.

IV. State various methods used in understanding the geochemical model of the earth.

V. Write briefly on the following :

- a) Primary differentiation of the earth.
- b) Colloidal matter in dispersion of elements.

VI. Write salient aspects on the following :

- a) Classification of geochemical elements.
- b) Elemental substitution.

VII. Discuss briefly on the following :

- a) Average composition of metamorphic rocks.
  - b) Cosmic abundance of elements.
-



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**M.Sc. – I (Semester – II) (Old CGPA) Examination, 2016**  
**APPLIED GEOLOGY (Paper – VIII)**  
**Geochemistry**

Day and Date : Wednesday, 6-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions:** 1) **All** questions carry **equal** marks.  
2) Attempt **five** questions.  
3) Question **I** is **compulsory**.  
4) Answer **any two** questions from questions no. **II, III and IV**.  
5) Answer **any two** questions questions no. **V, VI, and VII**.  
6) Draw **neat** and labelled diagrams **wherever** necessary.

I. Select the correct answer :

14

- 1)  $E^h = 0.0$  defines the geochemical fence of
  - a) Lime stone-carbonates
  - b) Organic matter
  - c) Neutral
  - d) None
- 2) Higher concentration of radioactive elements U and Th in the crustal rocks is due to their affinity with
  - a)  $O_2$
  - b) S
  - c) Fe
  - d) None
- 3) Goldschmidt has classified halides and gypsum in the sedimentary cycle as
  - a) Resitates
  - b) Oxidates
  - c) Carbonates
  - d) Evaporites
- 4) The dominant oxide in igneous rocks is silica and there are two frequency maxima at 52% and 73%  $SiO_2$  corresponding to two commonest igneous rocks. They are
  - a) Phonolite and carbonatite
  - b) Syenite and theralite
  - c) Basalt and Granite
  - d) None



- 5) The term geochemistry was coined by
- a) Brian mason
  - b) Schonbein
  - c) Goldschmidt
  - d) Clarke
- 6) Which of the following group of elements are least abundant in the earth ?
- a) Large Ion Lithophiles
  - b) REE
  - c) Noble elements
  - d) None
- 7) One of the causative factor for ozone hole is
- a) Increase in  $O_2$
  - b) Decrease in carbon
  - c) Increase in CFC
  - d) None
- 8) Find the odd one out
- a) Cu
  - b) Zn
  - c) As
  - d) Ba
- 9) Which of the following factors influence mobility of elements in secondary environment ?
- a) pH
  - b)  $E^h$
  - c)  $Z/r$
  - d) All the above
- 10) 34% of the total solar flux received by the earth is reflected and scattered back into the space. This is termed as
- a) Tropopause
  - b) Albedo
  - c) El Nino
  - d) None
- 11)  $Mg^{2+}$ ,  $Ca^{2+}$  and  $Na^+$  are soluble in sea water and reside for longtime because of their
- a) Low  $Z/r$
  - b) Low colloids
  - c) High  $CO_2$  in sea
  - d) None



- 12) The average composition of igneous rocks proposed by Clarke and Washington is on the basis of
- a) Felsic : mafic
  - b) Granite : basalt composition
  - c) 5159 Analysis
  - d) None
- 13) What amount of oxygen is fixed in continental crust ?
- a) 30%
  - b) 10%
  - c) 41%
  - d) 5%
- 14) Which of the radiogenic element has half life of 5730 years ?
- a)  $^{235}\text{U}$
  - b)  $^{16}\text{O}$
  - c)  $^{204}\text{Pb}$
  - d)  $^{14}\text{C}$

- II. Discuss various properties used in geochemical classification of elements. **14**
- III. Discuss various thermo nuclear reaction in the origin of elements. Add a note on cosmic abundance of elements. **14**
- IV. State various concepts in proposing a geochemical model of earth. **14**
- V. Write short notes on the following : **14**
- a) Various layers and properties of atmosphere.
  - b) Primary differentiation of earth.
- VI. Write briefly on the following : **14**
- a) K – Ar dating technique.
  - b)  $Z/r$  index in sedimentation.
- VII. Enumerate briefly on the following : **14**
- a) Quality control measures in geochemical analysis.
  - b) Role of pH during the formation of bauxite.
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**M.Sc. – II (Semester – III) Examination, 2016  
APPLIED GEOLOGY (Paper – IX) (New) (CGPA)  
Geotectonics and Physical Oceanography**

Day and Date : Tuesday, 29-3-2016  
Time : 2.30 p.m. to 5.00 p.m.

Total Marks :70

- Instructions :** 1) Answer **any five** questions.  
2) **All** question carry **equal** marks.  
3) Question **1** is **compulsory**.  
4) Answer **any two** question from **each** Section **A** Section **B**.  
5) Draw **neat** and labelled diagram **wherever** necessary.

1. Choose the correct answer for the following. **14**
- 1) Subduction zone is associated with  
a) Ridge                      b) Basin                      c) Trench                      d) Island
- 2) The continental margin characterized by a narrow shelf with trench below the slope is known as  
a) Mariana trench                      b) Chilean type  
c) Atlantic type                      d) None of the above
- 3) Out of all tectonic regions of the globe, the maximum heat flow is found in the  
a) Subduction zone                      b) Mid oceanic ridge  
c) Flank province                      d) Island arc
- 4) Asthenosphere is the zone  
a) Separating crust and mantle                      b) Within the upper mantle  
c) Within the lower mantle                      d) Separating core and mantle
- 5) Long, straight features parallel to the shore and separated from the maincoasts by lagoons and bays.  
a) Beaches                      b) Barriers                      c) Estuaries                      d) None



- 6) \_\_\_\_\_ are subcircular reefs enclosing a lagoon, about 40 m deep with no island and only partially exposed.  
a) Coral reef            b) Atolls            c) Fringing reefs    d) Barrier reefs
- 7) The primary process by which nutrients in deep sea return to the surface water is  
a) Heating of surface water            b) Downwelling  
c) Upwelling            d) Surface of deep dwelling organism
- 8) In which tectonic setting calc-alkaline magma is generated ?  
a) Oceanic rift            b) Subduction zone  
c) Continental rift            d) Intraplate
- 9) Lesser Himalayan domain in Himalaya is separated from great Himalaya by  
a) Main central thrust            b) Main Boundary thrust  
c) Himalayan frontal fault            d) Indus Suture zone
- 10) Near the midocean ridge system the lithospheric plates attain  
a) Maximum thickness            b) Uniform thickness  
c) Minimum thickness            d) None of the above
- 11) The carbonate is precipitated at  
a) Above CCD            b) Below CCD            c) At OMZ            d) None
- 12) At the convergent plate boundary the most common geologic features formed on the continental lithosphere are  
a) Island arc            b) Pull apart basin    c) Volcanic arc            d) Rift valleys
- 13) The Ninety East ridge located in  
a) Arabian sea            b) Off coast of Pakistan  
c) Persian gulf            d) Bay of Bengal
- 14) At divergent boundaries, partial melting of the upper mantle at relatively shallow depth produce \_\_\_\_\_  
a) Alkali basalts            b) Tholeiitic basalts  
c) Calc alkaline magmatism            d) Andesitic magmatism



SECTION – A

- II. What are oceanic sediments ? Describe the deposition and distribution of oceanic sediments.
- III. Explain the different types of plate margins. Add a note on tectonic of Indian subcontinent.
- IV. Describe the geological processes that occur in nearshore environments and on the continental shelf.

SECTION – B

- V. Explain in short
    - a) Origin of Himalaya
    - b) Petrology of oceanic crust
  - VI. Give an account on :
    - a) Estuary
    - b) Continental drift
  - VII. Explain briefly the following :
    - a) Causes if sea level changes
    - b) Sea floor spreading.
-







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**M.Sc. (Semester – III) (CGPA) (New) Examination, 2016  
APPLIED GEOLOGY (Paper – X)  
Mineral Exploration**

Day and Date : Thursday, 31-3-2016  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- N.B. :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Questions No. **I** is **compulsory**.
  - 4) Answer **any two** questions from Q. **II, III, and IV** and **any two** questions from Q. **V, VI, and VII**.
  - 5) **Draw neat and labeled diagrams wherever necessary.**

- I. 1) Richter scale is used to measure **14**
- |              |             |
|--------------|-------------|
| a) Intensity | b) Length   |
| c) Distance  | d) Diameter |
- 2) Gravity prospecting is based on
- |                 |                  |
|-----------------|------------------|
| a) Darcy's law  | b) Gilbert's law |
| c) Newton's law | d) None of these |
- 3) In Wenner electrode configuration the electrode are
- a) Equally spaced
  - b) Unequally spaced
  - c) Space between current electrode is more than potential electrode
  - d) None of these
- 4) Churn drill is a type of
- |                     |                  |
|---------------------|------------------|
| a) Percussion drill | b) Rotary drill  |
| c) Jet drill        | d) None of these |



- 5) Precipitation of elements takes place in  
a) Quiet environment                      b) Turbulent environment  
c) Glacial environment                    d) None of these
- 6) The patterns introduced at the same time as host matrix are classified  
a) Epigenetic                                b) Syngenetic  
c) Polygenetic                              d) None of these
- 7) Alluvial gold is recovered from  
a) Deep sea                                  b) Shallow ocean  
c) River basin                                d) None of these
- 8) Malachite stains on the surface indicates the presence of  
a) Iron ore                                    b) Bauxite ore  
c) Sulphide ore                              d) Zinc ore
- 9) Erianthus Gigantcus species is an indicator of  
a) Lead                      b) Iron                      c) Manganese            d) Gold
- 10) Bouger correction is applied to  
a) Seismic data                              b) Radiometric data  
c) Gravity data                                d) None of these
- 11) The curie point of magnetite is  
a) 450° C                      b) 525° C                      c) 350° C                      d) 1050° C
- 12) Flux gate magnetometer is  
a) Airborne magnetometer                      b) Surface magnetometer  
c) Subsurface magnetometer                    d) None of these
- 13) Hodograph is a graph drawn to interpret  
a) Magnetic data                                b) Gravity data  
c) Seismic data                                  d) None of these
- 14) 'Auram' is the term used for  
a) Silver                                        b) Iron  
c) Gold    d) Platinum



- II. Describe guides and Geological criteria for mineral prospecting. **14**
  - III. Describe principles and concepts in radiometric prospecting. Add a note on data acquisition and interpretation. **14**
  - IV. Describe classification of Geochemical surveys. **14**
  - V. Write short notes on : **14**
    - a) Methods of mineral prospecting
    - b) Geochemical anomalies.
  - VI. Write in brief on : **14**
    - a) Methods of sampling
    - b) Corrections applied to gravity data.
  - VII. Write short account on : **14**
    - a) Bio-geochemical survey
    - b) Geo chemical provinces.
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**M.Sc. (Semester – III) (CGPA) Examination, 2016  
(Paper – XI) (New) APPLIED GEOLOGY  
Engineering and Mining Geology**

Day and Date : Saturday, 2-4-2016

Max.Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question No. **1** is **compulsory**.
  - 4) Answer **any two** questions from Q. No. **2, 3 and 4** and **two** questions from Q. No. **5, 6 and 7**.
  - 5) Draw **neat** and labeled diagrams **wherever** necessary.

I. Select the correct answer from the choices given below :

**14**

- 1) Opening through the dam, through which checking and repair is done is
  - a) Conduit
  - b) Inspection chamber
  - c) Gallery
  - d) Silt
- 2) In most engineering calculations \_\_\_\_\_ density is used.
  - a) Dry density
  - b) Saturated density
  - c) Bulk density
  - d) None of the above
- 3) Uniaxial compressive strength values increases for the series
  - a) Sandstone – Gneiss – Quartzite – Basalt
  - b) Basalt – Quartzite – Gneiss – Sandstone
  - c) Gneiss – Quartzite – Basalt – Sandstone
  - d) Sandstone – Basalt – Quartzite – Gneiss
- 4) Triaxial test is used to
  - a) Assess behaviour of rock to confining pressure
  - b) Assess behaviour of rock to directed pressure
  - c) Assess behaviour of rock to both confining and directed pressure
  - d) None of the above

P.T.O.



- 5) Bulk density is the weight per unit volume of a rock samples with
- a) Natural moisture content
  - b) The pore are filled with water
  - c) An absolutely oven dried rock
  - d) All the above
- 6) Tunnel through which water is allowed to flow under a pressure head is the
- a) Subway tunnel
  - b) Pedestrian tunnel
  - c) Navigational tunnel
  - d) Pressure tunnel
- 7) Road cut parallel to strike of the bed is
- a) Favourable site
  - b) Very good site
  - c) Unfavourable site
  - d) None of the above
- 8) To avoid flooding of a mine the \_\_\_\_\_ should be at the highest point.
- a) Sump
  - b) Collar
  - c) Drift
  - d) Shaft
- 9) For placer deposits \_\_\_\_\_ sampling method is used.
- a) Channel
  - b) Bulk
  - c) Placer
  - d) Pattern
- 10) The screens are generally given the tilt of about
- a)  $40^\circ - 60^\circ$
  - b)  $10^\circ$  to  $15^\circ$
  - c)  $60^\circ$  to  $80^\circ$
  - d)  $80^\circ$
- 11) Briquetting is a process of forming brick shaped blocks of fine particles by application of
- a) Heat
  - b) Pressure
  - c) Water
  - d) Air
- 12) A ramp is an inclined surface which connects the two \_\_\_\_\_ for the transport purpose.
- a) pits
  - b) faces
  - c) slopes
  - d) benches
- 13) Among jaw crushers the \_\_\_\_\_ type of crusher produces uniform sized pieces of rock.
- a) Blake
  - b) Dodge
  - c) Hammer
  - d) Gyratory
- 14) The country rock occurring above the vein of ore body is known as
- a) Hanging wall
  - b) Stope
  - c) Raise
  - d) Winze



- II. Explain different types of dams on various geological conditions. **14**
  - III. Discuss in detail the properties of good building stones. **14**
  - IV. What does sampling mean ? Explain in detail methods of sampling. **14**
  - V. Answer the following : **14**
    - A) Different methods of ore screening.
    - B) Discuss the role of geological structure in engineering.
  - VI. Explain in short the following : **14**
    - A) Blasting practices used in mines.
    - B) Dams on carbonate rocks.
  - VII. Discuss the following : **14**
    - A) Heavy media separation method.
    - B) Silting of reservoir.
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**M.Sc. – II (Semester – III) (New) (CGPA) Examination, 2016**  
**APPLIED GEOLOGY Paper – XII**  
**Remote Sensing and GIS**

Day and Date : Tuesday, 5-4-2016  
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question **1** is **compulsory** and should be answered in the question paper.
  - 4) Answer **any two** essay questions from **2, 3, 4**.
  - 5) Answer **any two** short note questions from **5, 6, 7**.
  - 6) Draw neat and labeled diagrams **wherever** necessary.

1. Fill in the blanks with appropriate choice :

14

- 1) Arc GIS native file format is \_\_\_\_\_
  - a) .dwg
  - b) .shp
  - c) .coverage
  - d) .tiger
- 2) LISS-IV is with spatial resolution \_\_\_\_\_
  - a) 0.5 m
  - b) 23.5 m
  - c) 8.5 m
  - d) 72.5 m
- 3) One type of digitization error that result in gap remain between arcs
  - a) Under shoot
  - b) Overshoot
  - c) Dangle
  - d) None of the above
- 4) Which of the following satellite series concerned India ?
  - a) Land sat
  - b) Spot
  - c) IRS
  - d) JRS
- 5) FCC stands for \_\_\_\_\_
  - a) Ferres Colour Composite
  - b) False Colour Composite
  - c) Few Colour Composite
  - d) All of the above





- 6) NRSA stands for \_\_\_\_\_
- a) National Research Space Administration
  - b) National Regional Space Agency
  - c) Nano Research Space Agency
  - d) National Remote Sensing Agency
- 7) G.P.S. provides data of \_\_\_\_\_
- a) Latitude
  - b) Longitude
  - c) Height
  - d) All of the above
- 8) Remote sensing system which use the naturally available energy are called as
- a) Passive sensor
  - b) Active sensors
  - c) Both a and b
  - d) None of the above
- 9) IFOV stands for
- a) Incident Field of View
  - b) Instantaneous Field of View
  - c) Incident Front of View
  - d) Instantaneous Front of View
- 10) GLONASS is global position system operated by \_\_\_\_\_ country.
- a) Russia
  - b) Japan
  - c) Europe
  - d) U.S.A.
- 11) The most important source of electromagnetic energy is \_\_\_\_\_
- a) Earth
  - b) Moon
  - c) Atmosphere
  - d) Sun
- 12) Vector data is known as \_\_\_\_\_
- a) Point
  - b) Line
  - c) Polygon
  - d) All of the above
- 13) Altitude of geostationary satellite is \_\_\_\_\_
- a) 20000 Km.
  - b) 36000 Km
  - c) 900 Km
  - d) 700 Km
- 14) Geostationary satellites are ideal for \_\_\_\_\_
- a) Land mapping
  - b) Meteorology
  - c) Communication
  - d) None of these



2. Explain the importance of Remote Sensing and GIS in Geo-science. **14**
  3. Write history of remote sensing and components of GIS. Add a note on its advantages. **14**
  4. What is aerial photography ? Describe various types of aerial photographs. **14**
  5. Write notes on : **14**
    - a) Scattering
    - b) Energy interaction with atmosphere.
  6. Explain in short : **14**
    - a) Hardware and software for GIS.
    - b) GPS.
  7. Write a brief account on : **14**
    - a) Vector data set.
    - b) IRS.
-





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**M.Sc. (Part – II) (Semester – IV) (New CGPA) Examination, 2016**  
**APPLIED GEOLOGY (Paper – XIII)**  
**Environmental Geology and Disaster Management**

Day and Date : Wednesday, 30-03-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :**
- 1) Answer **any five** questions.
  - 2) **All** questions carry **equal** marks.
  - 3) Question No. 1 is **compulsory**.
  - 4) Answer **any two** questions from Q. No. 2, 3 and 4 and **two** questions from Q. No. 5, 6 and 7.
  - 5) Draw **neat** and labeled diagrams **wherever** necessary.

1. Fill in the blank with correct choice :

- 1) Which of the following is not a green house gas ?  
a) Methane            b) Oxygen            c) CO<sub>2</sub>            d) CFC
- 2) The Latur earthquake of September 30, 1993 and Jabalpur earthquake of May 22, 1997 cautioned that the Indian shield is not so free of seismicity. It is an eye opening to  
a) Interplate tectonic            b) Intraplate seismicity  
c) Intraplate tectonic            d) None of the above
- 3) Acid rains are result of  
a) Air pollution            b) Sound pollution  
c) Water pollution            d) None
- 4) What takes ages to develop but only one generation of human beings to destroy ?  
a) Top soil            b) Groundwater  
c) Minerals            d) None
- 5) Excess consumption of fluoride causes  
a) Necrosis            b) Heart disease  
c) Fluorosis            d) None



- 6) The typical citation of Reservoir Induced Seismicity (RIS) of India is
- a) Koyna dam
  - b) Srisaillam dam
  - c) Almatti dam
  - d) All the above
- 7) The transfer of energy from one tropic level to another constitute the
- a) Food chain
  - b) Biochemical cycling
  - c) Energy flow
  - d) None
- 8) The main atmospheric layer near the surface of the earth is
- a) Troposphere
  - b) Mesosphere
  - c) Stratosphere
  - d) Inosphere
- 9) The greatest Tsunami disaster that struck Sumatra – Andaman Islands killing over 3 lakhs people occurred on
- a) 24<sup>th</sup> Dec. 2004
  - b) 25<sup>th</sup> Dec. 2004
  - c) 26<sup>th</sup> Dec. 2004
  - d) None
- 10) Which of the following pairs of air pollutant causes acid rain ?
- a) Sulphur dioxide – Carbon dioxide
  - b) Oxides of nitrogen – Carbon monoxide
  - c) Sulphur dioxide – Oxides of nitrogen
  - d) Ammonia – Chlorine
- 11) Cyclones are \_\_\_\_\_ pressure areas from centre of which pressure increase outwards.
- a) Low
  - b) High
  - c) Constant
  - d) Variable
- 12) The solidwaste from hospital is classified as
- a) Hazardous
  - b) Non hazardous
  - c) Compostable
  - d) Combustible
- 13) The natural disastrous events like eruption of volcanoes, earthquakes, cyclones, fires etc. bring about environmental disturbances, which are
- a) Irreversible
  - b) Reversible
  - c) Both a) and b)
  - d) None
- 14) The air pollutant known as secondary in nature is
- a) Sulphur dioxide
  - b) Ammonia
  - c) Peroxyacetyl nitrate
  - d) Methane



2. What are floods ? Explain causes and suggest mitigation measures.
  3. Discuss various types of air pollutants. Add a note on global warming.
  4. Write in detail on Killari earthquake. Add note on disaster mitigation.
  5. Write briefly on the following :
    - i) Landslides
    - ii) Seismic zones of India.
  6. Describe the following :
    - i) Soil salinity and alkalinity
    - ii) Different types of waste.
  7. Write short note on the following :
    - i) Application of GIS and remote sensing in disaster management
    - ii) Water pollutants.
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**M.Sc. – II (Semester – IV) Examination, 2016**  
**APPLIED GEOLOGY (Paper – XIV)**  
**Fuel Geology and Resource Management (CGPA Pattern) (New)**

Day and Date : Friday, 1-4-2016  
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question No. **1** is **compulsory**.  
4) Answer **any two** questions from Q. No. **2, 3** and **4**.  
5) Answer **any two** questions from Q. No. **5, 6** and **7**.  
6) Draw **neat** and labeled diagram **wherever** necessary.

1. Choose the correct answer :

- 1) Atomic energy is obtained by using ores of \_\_\_\_\_  
a) Copper  
b) Zinc  
c) Uranium  
d) All the above
- 2) The management of resources on earth which maintains the balance between human requirements and other species is  
a) Conservation  
b) Conversation  
c) Diversity of ecosystem  
d) Geological diversity
- 3) What type of energy is derived from heated groundwater ?  
a) Solar energy  
b) Geothermal energy  
c) Hydroelectric energy  
d) Nuclear energy
- 4) When combustion of coal takes place insufficient air (oxygen) which gas is formed instead of carbon dioxide  
a) Sulphur dioxide  
b) Nitrous oxide  
c) Carbon monoxide  
d) Nitrogen peroxide





- 5) Petroleum is formed from \_\_\_\_\_
- a) Domestic animals                      b) Organisms in sea  
c) Insects                                      d) Plants
- 6) The characteristic of coal is \_\_\_\_\_
- a) Brittle                                      b) Hard  
c) Porous                                      d) None of the above
- 7) Coal is formed from the remains of
- a) Vegetation only  
b) Animals only  
c) Both vegetation and animals  
d) Neither vegetation nor animals
- 8) Coal, petroleum and natural gas are product of \_\_\_\_\_ fuel
- a) Fossil                                      b) Inexastible  
c) Artificial                                      d) Man-made
- 9) Coal commonly occurs in \_\_\_\_\_ deposits.
- a) Glacial                      b) Wind                      c) Fluvial                      d) Doluvial
- 10) Hydrocarbons used in aeroplane as a fuel is \_\_\_\_\_
- a) Rock oil                                      b) Petrol  
c) Diesel                                      d) Gasoline
- 11) Chemical composition of coal is obtained by \_\_\_\_\_ analysis ?
- a) Gravimetric                                      b) Titrimetric  
c) Proximity                                      d) Spectrometric
- 12) A map prepared by joining the equal thickness point is a \_\_\_\_\_ map.
- a) Isobar                                      b) Isopatch  
c) Isorad                                      d) Isotherm



- 13) Cambay basin falls in the state of \_\_\_\_\_
- a) Gujarat
  - b) Maharashtra
  - c) Karnataka
  - d) None

- 14) The highest ranked coal is \_\_\_\_\_
- a) Bough head coal
  - b) Peat coal
  - c) Anthracite
  - d) None

2. Describe how migration of petroleum occurs. Discuss in detail types of migration of petroleum.
  3. Write in detail on oil potential of Bombay high basin.
  4. Give in detail petrographic and petrological aspects of coal.
  5. Write short note on :
    - a) Role of fuels in National development.
    - b) Nuclear waste and its management.
  6. Discuss in short :
    - a) Kerogene.
    - b) Tidal energy and its uses.
  7. Write in brief of the following :
    - a) Physical properties of petroleum.
    - b) Coalification.
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**M.Sc. – II (Semester – IV) Examination, 2016**  
**APPLIED GEOLOGY (New CGPA)**  
**Paper – XV : Climatology and Planetary Geology**

Day and Date : Monday, 4-4-2016  
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Q. 1 is **compulsory**.  
4) Answer **any two** essay questions from 2, 3, 4.  
5) Answer **any two** short note questions from 5, 6, 7.  
6) Draw **neat** and labeled diagrams **wherever** necessary.

1. Fill in the blanks with appropriate choice.

- 1) \_\_\_\_\_ % of the effective atmosphere is found up to the height of 29 km.  
a) 29                      b) 35                      c) 97                      d) 90
- 2) Inversion of temperature is \_\_\_\_\_  
a) Increase of temperature with altitude  
b) Decrease of temperature with altitude  
c) Uniform Temperature  
d) Decrease of temperature with latitudes
- 3) Medium and high frequency radio waves are reflected by which layer \_\_\_\_\_  
a) G layer              b) E layer              c) F layer              d) All of the above
- 4) The surface temperature of the Sun is  
a) 2000°C              b) 4000°C              c) 6000°C              d) 8000°C
- 5) Funnel shaped storms, which are smallest but most violent and disastrous of all the storms are  
a) Thunderstorms    b) Tornado              c) Typhoons              d) None of these
- 6) \_\_\_\_\_ gave the 'Seasonal variation of Winds'.  
a) German meteorologist              b) English meteorologist  
c) Australian meteorologist              d) Indian meteorologist

P.T.O.



- 7) Normal Lapse rate is supposed to be  
a) 6.5° C per 1000 m                      b) 6.5°C per 100 m  
c) 6.5° K per 1000 m                      d) 6.5° K per 100 m
- 8) The Gossamer ring is of planet  
a) Saturn                      b) Uranus                      c) Jupiter                      d) None of these
- 9) The most distant point from the Sun is  
a) Perihelion                      b) Aphelion  
c) Astronomical Unit                      d) None of these
- 10) The Canyon Valles Marineris situated on planet  
a) Venus                      b) Mercury                      c) Pluto                      d) None of these
- 11) The Caloris Basin is on planet  
a) Mercury                      b) Venus                      c) Mars                      d) None of these
- 12) The Earth's sister planet is  
a) Venus                      b) Mercury                      c) Mars                      d) None of these
- 13) The fastest wind among the solar system's planets is on  
a) Saturn                      b) Uranus                      c) Jupiter                      d) None of these
- 14) The coldest planet in the solar system is  
a) Neptune                      b) Saturn                      c) Pluto                      d) None of these
2. Explain in brief structure and composition of atmosphere.
3. Describe Thornthwaite's climatic classification.
4. Explain in brief exogenic and endogenic processes associated with origin and evolution of planets.
5. Write short notes on :  
a) Air Masses                      b) Planetary Volcanism
6. Describe in brief :  
a) Electromagnetic Spectrum    b) Asteroids
7. Explain in short :  
a) Nature of climatology                      b) Meteorites
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**M.Sc. (Part – II) (Semester – IV) (New– CGPA) Examination, 2016**  
**APPLIED GEOLOGY ( Paper – XVI)**  
**Research Methodology**

Day and Date : Wednesday, 6-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** 1) Answer **any five** questions.  
2) **All** questions carry **equal** marks.  
3) Question No. **1** is **compulsory**.  
4) Answer **any two** questions from Q.No. **2, 3 and 4** and **two** questions from Q.No. **5, 6 and 7**.  
5) Draw **neat** and labeled diagrams **wherever** necessary.

I. Fill in the blank with correct choice.

- 1) What is a research design ?
  - a) A way of conducting research that is not grounded in theory
  - b) The choice between using qualitative and quantitative methods
  - c) The study in which you present research findings
  - d) A framework for every stage of collection and analysis of data
- 2) Which one of the following is different from other member ?
  - a) Google
  - b) Windows
  - c) Linux
  - d) Mac
- 3) The data collected by someone else and which have already been passed through the statistical process.
  - a) Primary data
  - b) Analysed data
  - c) Secondary data
  - d) All the above
- 4) In the context of internet, identify the incorrect pair from the following :
  - a) .gov-government website
  - b) .ac- accounting website
  - c) .com- commercial website
  - d) .edu-educational website

P.T.O.



- 5) Which one of the following is a research tool ?
- a) Graph                                      b) Illustration  
c) Questionnaire                              d) Diagram
- 6) \_\_\_\_\_ is the index to measure both the productivity and impact of published work of a scientist or scholar.
- a) Citation index                              b) h- index  
c) Impact factor                              d) Scopus
- 7) Which one of the following is an example of operating system ?
- a) Microsoft Word                              b) Microsoft Excel  
c) Microsoft Access                              d) Microsoft Windows
- 8) HTML is used to create
- a) Machine language                              b) Web page  
c) High level language                              d) Web server
- 9) In social science and business, \_\_\_\_\_ research includes surveys and fact-finding enquiries of different kinds.
- a) Diagnostic      b) Descriptive      c) Applied      d) Conceptual
- 10) In the context of internet, what is the full form of URL ?
- a) User Requested Link                              b) Unique Request Locator  
c) Ultimate Response Location                              d) Universal Resource Locator
- 11) Which of the following softwares is used to process and analyse quantitative data ?
- a) Quark Express                              b) SPSS  
c) Quant Chrome                              d) SSQN
- 12) Arrange the following units of computer memory in descending order of magnitude.
- Byte, gigabyte, bit, megabyte, terabyte.
- a) Terabyte, gigabyte, megabyte, byte, bit  
b) Gigabyte, terabyte, megabyte, bit, byte  
c) Gigabyte, megabyte, terabyte, byte, bit  
d) Bit, byte, terabyte, megabyte, gigabyte



- 13) \_\_\_\_\_ aims at finding a solution for a immediate problem facing a society or industries.
- a) Applied research
  - b) Descriptive research
  - c) Fundamental research
  - d) None of the above
- 14) Which of the following is non probability sampling ?
- a) Systematic sampling
  - b) Random sampling
  - c) Judgement sampling
  - d) None of the above
2. Briefly describe the different steps involved in a research process.
3. How computers are used as a tool in research ? Give examples.
4. Define indices. Explain various types of indices.
5. Discuss in brief :
- i) Significance of research.
  - ii) Sample design.
6. Answer the following :
- i) Data collection.
  - ii) Results and discussion.
7. Write short notes on :
- i) Impact factor.
  - ii) Abstract.
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