

Seat No.	
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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**MINERALOGY & OPTICS**

Day & Date: Monday, 18-11-2019  
 Time: 11:30 AM To 02:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) Fayalite has the specific gravity in g/cc.
  - a) 4.39
  - b) 3.2
  - c) 2.4
  - d) 4.0
- 2) Diopside has a chemical formula \_\_\_\_\_.
  - a)  $\text{CaMgSi}_2\text{O}_6$
  - b)  $\text{CaFeSi}_2\text{O}_6$
  - c)  $\text{NaAlSi}_2\text{O}_6$
  - d)  $\text{CaMnSi}_2\text{O}_6$
- 3) The angle between the two optical axes is \_\_\_\_\_ angle.
  - a) 2V
  - b) extinction
  - c) facial
  - d) none of above
- 4) Which of the following mineral has straight extinction?
  - a) Augite
  - b) Diopside
  - c) Olivine
  - d) Actinolite
- 5) Garnet is an \_\_\_\_\_ mineral.
  - a) Uniaxial
  - b) Biaxial
  - c) Isotropic
  - d) None of above
- 6) Epidote group of minerals has a \_\_\_\_\_ structure.
  - a) Nesosilicate
  - b) Sorosilicates
  - c) Cyclosilicate
  - d) None of above
- 7) Fibrolite is a fibrous variety of \_\_\_\_\_.
  - a) Andalusite
  - b) Montmorillonite
  - c) Sillimanite
  - d) kyanite
- 8) Pyroxene group of minerals crystallizes in both \_\_\_\_\_ and \_\_\_\_\_ systems.
  - a) Orthorhombic and Monoclinic
  - b) Cubic and Triclinic
  - c) Orthorhombic and Hexagonal
  - d) Hexagonal and Tetragonal
- 9) Zinwaldite is a \_\_\_\_\_ mica.
  - a) Lithium
  - b) Trioctahedral
  - c) Both a) and b)
  - d) All of the above
- 10) Alkali feldspar has a \_\_\_\_\_ extinction.
  - a) Straight
  - b) Oblique
  - c) Both of above
  - d) None of above
- 11) Kyanite in a metamorphic rock, generally indicates pressures greater than \_\_\_\_\_ kilobars.
  - a) 6
  - b) 8
  - c) 4
  - d) 5

- 12) Smectite is \_\_\_\_\_ group of minerals.  
 a) Clay    b) Mica  
 c) Epidote    d) None of the above
- 13) Labradorite belongs to the \_\_\_\_\_.  
 a) Alkali feldspars                                      b) Plagioclase feldspars  
 c) Feldspathoids                                      d) None of the above
- 14) Which of the following is a Zeolite group of mineral?  
 a) Natrolite    b) Stilbite  
 c) Mesolite    d) All of above

- Q.2 A) Answer the following questions. (Any Four)                                      08**  
 1) Describe reaction rim structure.  
 2) Define perthites and antiperthites.  
 3) What are aluminosilicates?  
 4) Physical properties of Quartz.  
 5) What is refractive index?
- B) Write Notes. (Any Two)                                      06**  
 1) Zeolites  
 2) Gemstones  
 3) Spineloids
- Q.3 A) Answer the following questions. (Any Two)                                      08**  
 1) Describe feldspathoids.  
 2) Uniaxial and biaxial minerals.  
 3) Describe tungstates and molybdates.
- B) Answer the following questions. (Any One)                                      06**  
 1) What are garnets. Write a note on garnet group of minerals.  
 2) Describe in brief the clay group of minerals.
- Q.4 A) Answer the following questions. (Any Two)                                      10**  
 1) Describe the Hess pyroxene triangle.  
 2) How to determine the optic sign of uniaxial minerals.  
 3) Describe in brief amphibole group of minerals.
- B) Answer the following questions. (Any One)                                      04**  
 1) Physical and optical properties of feldspar group of minerals.  
 2) Describe in brief the alumino-silicates.
- Q.5 Answer the following questions. (Any Two)                                      14**  
 a) Describe in brief the olivine group of minerals.  
 b) Define twinning. Write a short notes on twinning in feldspars.  
 c) Describe in brief the mica group of minerals.

**Seat  
No.****Set P**

**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019  
Applied Geology  
GEOCHEMISTRY**

Day & Date: Tuesday, 05-11-2019  
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Draw neat and labeled diagram wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.****14**

- 1) Elements having strong affinity for silicates are known as \_\_\_\_\_.
  - a) Lithophiles
  - b) Siderophiles
  - c) Chalcophiles
  - d) Atmosphiles
- 2) According to the cosmic abundance which of the following element is abundant \_\_\_\_\_.
  - a) Iron
  - b) Carbon
  - c) Silicon
  - d) Hydrogen
- 3) The upper crust of the earth consists mainly of \_\_\_\_\_.
  - a) Sandstone
  - b) Shale
  - c) Limestone
  - d) Igneous and Metamorphic rocks
- 4) Natural Uranium is \_\_\_\_\_.
  - a) A mixture of  $U^{238}$ ,  $U^{236}$ ,  $U^{235}$
  - b)  $U^{238}$  with coating of  $U^{235}$
  - c) A mixture of  $U^{238}$  and  $Th^{232}$
  - d) None of the above
- 5) The most abundant mineral in the earth's crust belongs to \_\_\_\_\_.
  - a) Quartz
  - b) Pyroxenes
  - c) Plagioclase Feldspar
  - d) Potash feldspar
- 6) Which is the most stable mineral towards weathering?
  - a) Quartz
  - b) Feldspar
  - c) Hornblend
  - d) Olivine
- 7) Rb-element is usually found dispersed in \_\_\_\_\_.
  - a) Na-mineral
  - b) K-mineral
  - c) Ca-mineral
  - d) Al-mineral
- 8) The concentration of given elements in sea water is a function of \_\_\_\_\_.
  - a) Its rate of removal
  - b) Its rate of addition
  - c) Its rate of removal and addition
  - d) Its type and affinity towards
- 9) The geochemical character of an element is largely governed by the \_\_\_\_\_.
  - a) Number of protons in the nucleus
  - b) Number of Neutrons in nucleus
  - c) Electron configuration
  - d) All of the above
- 10) Quartz and Tridymite are the example of \_\_\_\_\_.
  - a) Polymorphism
  - b) Isomorphism
  - c) Diadochy
  - d) None of the above

- 11) The term isotope is used for the elements \_\_\_\_\_.  
 a) Same chemical properties and same atomic weight.  
 b) Differing in atomic weight and stability but not appreciably in chemical properties.  
 c) Same in atomic weight and stability but differing in chemical properties  
 d) With the same atomic weight but different in neutrons and protons value
- 12) Which of the following factors would increase the chemical weathering rate?  
 a) Increasing rainfall  
 b) Increasing temperature  
 c) Increasing organic activity  
 d) All of these
- 13) Chondrites are mainly consisting of \_\_\_\_\_.  
 a) Olivine only  
 b) Pyroxene only  
 c) Olivine and/or pyroxene  
 d) Iron and nickel
- 14) Who was introduced the term siderophile, Chalcophile, lithophile and atrophied \_\_\_\_\_.  
 a) Goldschmidt (1923)  
 b) Ringwood (1957)  
 c) Clarke (1924)  
 d) King (1924)

- Q.2 A) Answer the following questions. (Any Four) 08**  
 1) Hydrosphere  
 2) Achondrite  
 3) Definition of Thermodynamics.  
 4) What is siderophile?  
 5) Radiogenic Isotope
- B) Answer the following questions. (Any Two) 06**  
 1) What is Pauling's rule?  
 2) Significance of Fench Diagram.  
 3) Brief introduction on History of Geochemistry.
- Q.3 A) Answer the following questions. (Any Two) 08**  
 1) Composition of Upper Mantle.  
 2) Classification of Meteorites.  
 3) What are different uses of REE in geological problems?
- B) Answer the following questions. (Any One) 06**  
 1) Write short notes on use of Trace elements in geology.  
 2) Distribution of elements in Sedimentary rocks.
- Q.4 A) Answer the following questions. (Any Two) 10**  
 1) Primary differentiation of earth.  
 2) Write down note on Geochemical cycle.  
 3) Wet and dry chemical analysis.
- B) Answer the following questions. (Any One) 04**  
 1) Write note on various aspects of Palaeo-Climatology.  
 2) U-Th-Pb Technique for dating of rocks.
- Q.5 Answer the following questions. (Any Two) 14**  
 a) Discuss in short composition of core.  
 b) Write down different aspects of air pollution.  
 c) What are different causes and products of chemical weathering?

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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019  
Applied Geology  
SEDIMENTOLOGY AND PALAEOLOGY**

Day & Date: Thursday, 07-11-2019  
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

**Instructions:** 1) All questions carry equal marks.  
2) Draw neat and labelled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) If an aggregate of sediments of particles that are all about same size it is said to be \_\_\_\_\_.  
a) Well sorted                                      b) Sandstone  
c) Poorly sorted                                    d) Lithified
- 2) Coares- grained sediments are transported by \_\_\_\_\_.  
a) Traction process                              b) Saltation process  
c) Suspension process                          d) None of the above
- 3) Which of the following can be used to determine Paleocurrent direction?  
a) Mud cracks                                      b) Turbidity currents  
c) Graded bedding                                d) Cross bedding
- 4) The liquid used to separate heavy minerals form light minerals is \_\_\_\_\_.  
a) Chloroform                                      b) Kerosene  
c) Ethylene                                         d) Bromoform
- 5) We differentiate an arkose from a granite on the basis of \_\_\_\_\_.  
a) Mineralogy                                      b) Geochemistry  
c) Grain size                                        d) Texture
- 6) Quartz arenites contains \_\_\_\_\_.  
a) < 50% Quartz                                 b) 50-75% Quartz  
c) 75-95% Quartz                                d) > 95% Quartz
- 7) Mud cracks are most likely to form by \_\_\_\_\_.  
a) Rapidly changing patterns of erosion and deposition  
b) Fast-moving water that gradually slowed down  
c) Gently oscillating waves  
d) Periodic exposure to the air and drying out
- 8) Petrified wood is an examples of \_\_\_\_\_.  
a) Encrustation                                      b) Substitution  
c) Alteration                                        d) Dessication
- 9) The study of trace fossils in known as \_\_\_\_\_.  
a) Synecology                                      b) Paleoecology  
c) Ichnology                                         d) Palynology
- 10) Trilobite fossils are recovered from the rocks ranging in age from.  
a) Pliocene to Pleistocene                      b) Triassic to Jurassic  
c) Cambrian to Permian                         d) Pleistocene to Holocene

- 11) First vertebrate (Fish) appeared in \_\_\_\_\_.
  - a) Triassic
  - b) Ordovician
  - c) Cretaceous
  - d) Permian
- 12) Which one is plant fossils \_\_\_\_\_.
  - a) Schizoneura
  - b) Favosites
  - c) Productus
  - d) Syringothyris
- 13) Homo sapiens belong to order \_\_\_\_\_.
  - a) Primates
  - b) Rodentia
  - c) Chiroptera
  - d) Mollusca
- 14) The deposits of the siwalik strata commenced in \_\_\_\_\_.
  - a) Paleocene
  - b) Late Eocene
  - c) Early Oligocene
  - d) Middle Miocene

- Q.2 A) Answer the following questions. (Any Four) 08**
- 1) Maturity of grain
  - 2) Rain prints
  - 3) Greywacke
  - 4) Siliceous Microfossils
  - 5) Define Biostratigraphy
- B) Write Short Notes.(Any Two) 06**
- 1) Sediments transport mechanism
  - 2) Application of sedimentary structure
  - 3) Heavy mineral significance
- Q.3 A) Answer the following questions. (Any Two) 08**
- 1) Froude number and its application
  - 2) Sedimentary cycle
  - 3) Lower Gondwana flora
- B) Answer the following questions. (Any One) 06**
- 1) Classify sedimentary basin with Indian examples.
  - 2) Morphology of trilobites, geological age and its significance.
- Q.4 A) Answer the following questions. (Any Two) 10**
- 1) Define diagenesis and different process in diagenesis.
  - 2) Dolomitisation and de-dolomitisation.
  - 3) Note of Evolution of man.
- B) Answer the following questions. (Any One) 04**
- 1) Mode of preservation of fossils
  - 2) Types of non-clastic rocks.
- Q.5 Answer the following questions. (Any Two) 14**
- 1) Define rocks Texture? Explain texture of clastic rocks.
  - 2) Write a note on Foraminifera. Explain application of foraminifera in mineral exploration and paleo-environmental studies.
  - 3) Write down how dinosaurs are evolved? Explain in short their extinction with reference to Indian examples.

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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019  
Applied Geology  
ECONOMIC GEOLOGY**

Day & Date: Saturday, 09-11-2019  
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Draw neat and labeled diagram whenever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) Polymetallic nodules of the ocean floor contain significant amounts of \_\_\_\_\_.  
a) Cu-Ni-Co                                      b) Pb-Zn-Ti  
c) Hg-Mo-Pt                                      d) U-Th-Nb
- 2) Placer deposit along hill slope, caused by gravity are known as \_\_\_\_\_.  
a) Alluvial placers                              b) Eolian placers  
c) Eluvial placers                              d) Lacustrine places
- 3) Gossans or cap rocks are good indicators of which of the following types of deposits?  
a) Hydrothermal deposits                      b) Placer deposits  
c) Residual deposits                              d) Secondary sulphide deposits
- 4) Which of the following is / are ores of Tungsten?  
a) Scheelite                                      b) Azurite  
c) Pyrite    d) Psilomelane
- 5) Which of the following is not a carbonate ore minerals \_\_\_\_\_.  
a) Cerussite                                      b) Witherite  
c) Smithsonite                                      d) Bornite
- 6) \_\_\_\_\_ characterized by the clays dickite, kaolinite and pyrophyllite (all hydrated aluminum silicates) and quartz.  
a) Advanced argillic alteration              b) Argillic alteration  
c) Prophilitic alteration                      d) Potassic alteration
- 7) Layered Igneous rocks could be good sites for the mineralization of \_\_\_\_\_.  
a) Gold    b) Tungsten  
c) Chromite                                      d) Diamonds
- 8) World largest Barites deposit is located in \_\_\_\_\_.  
a) Managampet in Cuddapah basin  
b) Superior province in Canada  
c) Vindhyan basin in central India  
d) Witwatersand in South Africa
- 9) Galena is an ore of?  
a) Iron    b) Copper  
c) Lead    d) Manganese
- 10) Pseudomorphs are very common in \_\_\_\_\_ deposit.  
a) Ladder vein                                      b) Replacement  
c) Cavity filling                                      d) Magmatic

- 11) Deposits that were formed subsequent to the formation of the host rocks are called \_\_\_\_\_.
  - a) Epigenetic
  - b) Eclogite
  - c) Syngenetic
  - d) All the above
  
- 12) What is the mineral which contains a metallic element which can be economically exploited called as?
  - a) Ore minerals
  - b) Metallic mineral
  - c) Eco-ore
  - d) Eco-mineral
  
- 13) Which one of the following deposit is a placer deposit?
  - a) Manganese
  - b) Zinc
  - c) Monazite
  - d) Cobalt
  
- 14) Which of the following mineral is characterized by black streak?
  - a) Hematite
  - b) Magnetite
  - c) Sphalerite
  - d) Malachite

**Q.2 A) Answer the following questions. (Any Four) 08**

- 1) Name nay four ore minerals of copper.
- 2) What are Industrial minerals?
- 3) Define syngenetic and epigenetic deposit.
- 4) Physical properties of Galena.
- 5) Prophyllitic alteration.

**B) Write Notes on. (Any Two) 06**

- 1) Give requirements of supergene enrichment.
- 2) Uses of reflectivity in ore identification.
- 3) Mine waters.

**Q.3 A) Answer the following questions. (Any two) 08**

- 1) Write note on paragenetic sequence.
- 2) Lindgren’s classification of ore deposits
- 3) Lithological and Structural control on ore localization.

**B) Answer the following questions. (Any One) 06**

- 1) Explain the process of Mechanical concentration.
- 2) Write note on ores in Igneous rocks.

**Q.4 A) Answer the following questions. (Any Two) 10**

- 1) Mineralization associated with divergent boundary.
- 2) Late magmatic concentration.
- 3) Magmatic fluid.

**B) Answer the following questions. (Any One) 04**

- 1) Physico-chemical properties of Hydrothermal fluid.
- 2) Banded Iron Formation.

**Q.5 Answer the following questions. (Any Two) 14**

- a) Give classification of Fluid Inclusion based on their origin. Discuss application of geothermometry in Geological studies.
- b) Explain in detail Agenigundala mineralised belt with reference to their geology, stratigraphy and depositional environment.
- c) Write a full note on National Mineral Policy.



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**M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**IGNEOUS AND METAMORPHIC PETROLOGY**

Day & Date: Monday, 04-11-2019  
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Draw neat & labeled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.**

**14**

- 1) The density of the oceanic layer in the crust is said to be \_\_\_\_\_.  
a) 3.00 g/cc    b) 2.50 g/cc  
c) 1.90 g/cc    d) 2.00 g/cc
- 2) What can be said about the grain size of pegmatite?  
a) Fine grained    b) Medium grained  
c) Fine to medium grained    d) Coarse grained
- 3) Peridotite containing olivine and ortho pyroxene as essential mineral is known as \_\_\_\_\_.  
a) Wherlite    b) Harzburgite  
c) Lherzolite    d) Limburgite
- 4) Which is the most dominant constituent of igneous rock?  
a)  $Al_2O_3$     b)  $SiO_2$   
c)  $CaCO_3$     d) CaO
- 5) What is the texture called when large-sized crystals are embedded in fine grained matrix?  
a) Granitic texture    b) Poikilitic texture  
c) Porphyritic texture    d) Directive texture
- 6) Granite belongs to which mode of occurrence of igneous rock?  
a) Volcanic rocks    b) Plutonic  
c) Hypabyssal    d) Volcanic and hypabyssal
- 7) The two most common mineral found in granites are \_\_\_\_\_.  
a) Diamond and mica    b) Mica and orthoclase  
c) Quartz and feldspar    d) Feldspar and corundum
- 8) In metamorphic rocks, layering within rocks is known as \_\_\_\_\_.  
a) bedding    b) foliation  
c) bending    d) recrystallization
- 9) The factor not affecting metamorphism is \_\_\_\_\_.  
a) Wind condition    b) Temperature  
c) Pressure    d) Chemically active fluids
- 10) What is the pressure exerted during the crustal movements called?  
a) Indirect pressure    b) Directed pressure  
c) Secondary pressure    d) Primary pressure

- 11) What is the direction of pressure exertion in load metamorphism?
  - a) Vertical
  - b) Horizontal
  - c) Inclined
  - d) Horizontal or incline
- 12) The type of metamorphism in which heat factor has played an important role is \_\_\_\_\_.
  - a) Dynamic metamorphism
  - b) Thermal metamorphism
  - c) Thermodynamic metamorphism
  - d) Barometric metamorphism
- 13) Dynamothermal or thermodynamic metamorphism involves action of \_\_\_\_\_.
  - a) Temperature
  - b) Pressure
  - c) Fluids
  - d) Temperature, pressure and fluids
- 14) Marble is formed from which rock?
  - a) Limestone
  - b) Granite
  - c) Sandstone
  - d) Shale

- Q.2 A) Answer the following questions. (Any Four) 08**
- 1) What is Rhyolitic magma.
  - 2) What are pyroclastics rocks?
  - 3) Define crystal fractionation.
  - 4) Define metasomatism.
  - 5) Give the mineral assemblages of granulite facies.
- B) Answer the following questions. (Any Two) 06**
- 1) What are Kimberlites? Give the Indian locations of kimberlites.
  - 2) Write a note on binary silicate systems.
  - 3) Write a note on ACF diagrams.
- Q.3 A) Answer the following questions. (Any Two) 08**
- 1) Differentiate between the alkaline basalt and tholeiitic basalt.
  - 2) Write a note on calc alkaline magmatism.
  - 3) Define metamorphism. Explain the agents of metamorphism.
- B) Answer the following questions. (Any One) 06**
- 1) Describe in detail the origin and types of carbonatites.
  - 2) What are paired metamorphic belts? Describe in detail.
- Q.4 A) Answer the following questions. (Any Two) 10**
- 1) Describe in brief the sources of mantle petrology.
  - 2) Write in brief about the Eskolas metamorphic facies.
  - 3) What is Magmatic differentiation? Also describe the various processes of magma evolution.
- B) Answer the following questions. (Any One) 04**
- 1) Differentiate between Retrograde and pro-grade metamorphism.
  - 2) Describe in brief the magmatism related to plate tectonics.
- Q.5 Answer the following questions. (Any Two) 14**
- a) Describe in detail the IUGS classification of igneous rocks.
  - b) What are the flood basalts? Describe in detail the Deccan Volcanic Flood Basalts.
  - c) Describe in detail the Barrowian metamorphic zones.

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**M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019  
Applied Geology  
INDIAN STRATIGRAPHY**

Day & Date: Wednesday, 06-11-2019  
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Draw neat and labelled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.**

**14**

- 1) Kimberlite in Vindhyan basin is in \_\_\_\_\_.  
a) Chelina                                      b) Panna  
c) Wajrakarur                                  d) All the above
- 2) Age of Arvalli fold belt is \_\_\_\_\_.  
a) Palaeozoic                                      b) Lower Archaean  
c) Palaeoproterozoic                              d) None of the above
- 3) Saucer series is equivalent to \_\_\_\_\_.  
a) Peninsular gneiss                              b) Upper Dharwar  
c) Middle Dharwar                                  d) Lower Dharwar
- 4) 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
- 5) 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
- 6) Patcham, Chari, Katrol and Umia are the formations of which of the following?  
a) Triassic of Spiti  
b) Jurassic of Kutch  
c) Cretaceous of Tiruchirapalli  
d) Palaeoproterozoic formation of South India
- 7) Which of the following represent longest time period?  
a) Precambrian                                      b) Palaeozoic  
c) Mesozoic    d) Cenozoic
- 8) Umria Marine beds are marine intercalations in \_\_\_\_\_.  
a) Karewa group                                      b) Siwalik group  
c) Kurnool group                                      d) Lower Gondwana
- 9) The age of fenestella shale is \_\_\_\_\_.  
a) Ordovician    b) Silurian  
c) Permian    d) Carboniferous



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**M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**HYDROGEOLOGY**

Day & Date: Friday, 08-11-2019  
 Time: 11:30 AM To 02:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Draw neat diagram wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) Which one of the following statements is NOT correct regarding oceanic mixed layer?
  - a) Solar heating stabilizes the mixed layer while wind over the ocean destabilizes it.
  - b) Solar heating stabilizes the mixed layer while oceanic rainfall destabilizes it.
  - c) Oceanic rainfall stabilizes the mixed layer while surface gravity waves destabilize it.
  - d) Evaporation of oceanic water destabilizes the mixed layer while oceanic precipitation stabilize it.
  
- 2) Water become groundwater when \_\_\_\_\_.
  - a) Water collects in a cup
  - b) Water condenses to become clouds
  - c) Water evaporates from the surface of the earth
  - d) Precipitation seeps into the recharge zone
  
- 3) The length of the screen is selected on the basis of the \_\_\_\_\_.
  - a) Thickness of the aquifer
  - b) Anticipated drawdown and decline in the water levels
  - c) Stratification of the aquifer.
  - d) All the above.
  
- 4) Resistivity prattling technique helps in finding the \_\_\_\_\_.
  - a) Vertical in homogeneities
  - b) Lateral in homogeneities for particular depth range
  - c) Both vertical and lateral in homogeneities
  - d) None of these
  
- 5) Identify sources of components of rainwater samples A, B, and C from their chemical associations given below:
  - A. Cl – Na – Mg –SO<sub>4</sub>
  - B. Al – Fe – Si – Ca – (K, Mg, Na)
  - C. NO<sub>3</sub>– NH<sub>4</sub> – P – K – SO<sub>4</sub>– (Ca, Na, Mg)
  - a) A – Soil, B – Fossil Fuel Burning, C - Marine
  - b) A – Marine, B – Fossil Fuel burning, C – Soil
  - c) A – Marine, B – Soil, C – Fossil Fuel burring
  - d) A – Fossil Fuel burning, B – Marine, C - Soil

- 6) Mark the correct statement about rhyolites and basalts \_\_\_\_\_.  
 a) Rhyolites are more permeable than basalt  
 b) Rhyolite and basalt, both are same permeable  
 c) Rhyolites are less permeable than basalt  
 d) Both may be classified as the good aquifer
- 7) Darcy's law is valid for \_\_\_\_\_.  
 a) Laminar flow only  
 b) Turbulent flow only  
 c) Both (A) and (B)  
 d) None of the above
- 8) Which of the following statements is true?  
 a) An aquifer in which the water table is at or near atmosphere pressure and is the upper boundary of the aquifer in a confined aquifer  
 b) In an unconfined aquifer the water level in a well is the same as the water table outside the well  
 c) A confined aquifer exists where groundwater is bound between layers of permeable substances  
 d) When an unconfined aquifer is tapped by a well, water is forced up, and sometimes above the.
- 9) In sea water the most abundant element present is \_\_\_\_\_.  
 a) Oxygen  
 b) Hydrogen  
 c) Chlorine  
 d) Sodium
- 10) A well through which water is added to an aquifer is called \_\_\_\_\_.  
 a) Discharge well  
 b) Pumping well  
 c) Recharging well  
 d) None of the above
- 11) In electrical resistive method, used for groundwater investigation, a current is generated in the field of frequency \_\_\_\_\_.  
 a) Less than 1 cycle per second  
 b) Less than 5 cycle per second  
 c) More than 5 cycle per second  
 d) More than 10 cycle per second
- 12) What percentage of fresh water is available to man?  
 a) 20%  
 b) 2%  
 c) 0.20%  
 d) None of these
- 13) Identify the INCORRECT statement \_\_\_\_\_.  
 a) Water holding capacity of sand > clay  
 b) Aeration in sand > clay  
 c) Nutrient supply capacity of sand < clay  
 d) Pollutant filtering capacity of sand < clay
- 14) In an aquifer the porosity varies \_\_\_\_\_.  
 a) Vertically only  
 b) Laterally only  
 c) Both of the above  
 d) None of the above

**Q.2 A) Answer the following questions. (Any Four)**

**08**

- 1) Confined water table
- 2) Zinc in groundwater
- 3) Precipitation
- 4) Location of springs
- 5) Tracer test

**B) Write Notes. (Any Two)**

**06**

- 1) Problems of fluoride in groundwater
- 2) Water table contour map
- 3) Hydraulic conductivity

- Q.3 A) Answer the following questions. (Any two) 08**
- 1) Confined and Unconfined aquifer.
  - 2) Note on hydrological cycle with suitable diagram.
  - 3) Briefly describe groundwater modelling.
- B) Answer the following questions. (Any One) 06**
- 1) Give an account of the surface electrical method of prospecting for groundwater.
  - 2) Enumerate the problems involved in mining operation due to groundwater.
- Q.4 A) Answer the following questions. (Any Two) 10**
- 1) Criteria for selecting groundwater recharge sites?
  - 2) Steady and unsteady flow?
  - 3) Necessity of groundwater legislation and its aspects.
- B) Answer the following questions. (Any One) 04**
- 1) What is Darcy law? Discuss briefly with neat sketches.
  - 2) Groundwater in a sedimentary terrain.
- Q.5 Answer the following questions. (Any two) 14**
- 1) Explain occurrence of groundwater in different geological formations.
  - 2) What are the source of saline water intrusion into costal area and relationship between saline and fresh water.
  - 3) Determine the quality of groundwater. Explain the standards for the constituents the quality of groundwater for drinking purpose.

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**M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**MINERAL EXPLORATION**

Day & Date: Monday, 18-11-2019  
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Draw neat and labeled diagram wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.****14**

- 1) For regional mineral exploration programme the scale of exploration included \_\_\_\_\_.
  - a) Literature survey
  - b) A regional geology
  - c) Remote sensing studies
  - d) All the above.
- 2) Find the odd one out \_\_\_\_\_.
  - a) Iron deposits
  - b) Chromite deposits
  - c) Magnise deposits
  - d) Bacites
- 3) Ore to oreshow ratio on an analogue is \_\_\_\_\_.
  - a) 1:30
  - b) 1:100
  - c) 1:500
  - d) 1:1000
- 4) Which one of the following mineral is associated with tungsten deposits?
  - a) Chalcopyrite
  - b) Pyrite
  - c) Arsero pyrite
  - d) Scheelite
- 5) The altimate method for identification of ore deposits is by carrying out \_\_\_\_\_.
  - a) Litho geochemical
  - b) Stream sediment geochemical
  - c) Lake sediment giochemical
  - d) None of the above
- 6) The work of finding deposits or any ore sign is \_\_\_\_\_.
  - a) Drifting
  - b) Exploration
  - c) Prospecting
  - d) Analysis
- 7) The waves travel only along the few surface of an elastic solid are \_\_\_\_\_.
  - a)  $\alpha$ - Ray
  - b) Rayleigh waves
  - c) Love waves
  - d) Gamma Rays
- 8) Wenner's expression of apparent resistivity is \_\_\_\_\_.
  - a)  $\frac{V}{I} 2\pi a = \rho$
  - b)  $2\pi a \frac{I}{V} = \rho$
  - c)  $\rho = \frac{V}{I} 2\pi a$
  - d)  $\rho = 2\pi a \frac{V}{I}$
- 9) P = Pgh stands for \_\_\_\_\_.
  - a) Secular variation
  - b) Magnetic induction
  - c) Isostatie model
  - d) Huggen's principle
- 10) Instrument not used for magnetic survey \_\_\_\_\_.
  - a) Steel astatic meter
  - b) High sensitivity magnetometer
  - c) Fluxgate magnetometer
  - d) Proton processing magnetometer



- 11) The imaginary surface having the same gravitational potential as the mean surface of the ocean called \_\_\_\_\_.
  - a) Bouguer correction
  - b) Isostasy
  - c) Geoid
  - d) Depth point
- 12) Very high magnetic susceptibility having in \_\_\_\_\_.
  - a) Ferromagnetic
  - b) Paramagnetic
  - c) Diamagnetic
  - d) Non magnetic
- 13) The value of universal gravitational constant (G) in the S.I. Unit is \_\_\_\_\_.
  - a) 6.67
  - b)  $6.67 \times 10^{-10}$
  - c)  $6.67 \times 10^{-9}$
  - d)  $6.67 \times 10^{-12}$
- 14) Detail survey of oil & gas is done by \_\_\_\_\_.
  - a) Seismic reflection
  - b) Seismic refraction
  - c) Geomagnetic method
  - d) Electromagnetic method.

**Q.2 A) Answer the following questions. (Any Four) 08**

- 1) Tidel correction
- 2) Note different geological features finding by magnetic survey
- 3) Transverse wave & its propagation Explains
- 4) Geological criteria for hydro carbons
- 5) Metallogenic distinct

**B) Write Notes. (Any Two) 06**

- 1) Elastic waves and Longitudinal waves
- 2) Magnetic Moment and Magnetic Field
- 3) Bachgeoand threshold

**Q.3 A) Answer the following questions. (Any Two) 08**

- 1) Explain surface prospecting method.
- 2) Cheap sampling K Bulk sampling
- 3) Stetigeaphic criteria of coal deposits in India.

**B) Answer the following questions. (Any One) 06**

- 1) Gravity variation concept and Gravity field of the earth, Explain.
- 2) Criteria for exploration of gold deposits in India.

**Q.4 A) Answer the following questions. (Any Two) 10**

- 1) What is apparent resistivity?
- 2) What is gravity anomaly? Explain positive and negative anomaly.
- 3) Principles of exploration.

**B) Answer the following questions. (Any One) 04**

- 1) What is magnetic porosity and permeability?
- 2) Exploration for ground water.

**Q.5 Answer the following questions. (Any Two) 14**

- a) Explain in brief concept and principles of gravity and magnetic survey and its applications.
- b) What is geochemical and geophysical anomalies and its favorable conditions?
- c) Write the flowchart for choice & sequence of exploration provinace.

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**M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**GEOTECTONIC AND PHYSICAL OCEANOGRAPHY**

Day & Date: Tuesday, 05-11-2019  
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Draw neat and labeled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.**

**14**

- 1) Deep earthquake are associated with \_\_\_\_\_.  
 a) mid oceanic ridges                      b) rift zone  
 c) subduction zone                         d) transform fault
- 2) Features found at the constructive plate boundaries include \_\_\_\_\_.  
 a) deep-sea trenches                        b) crumpled mountains  
 c) island arc volcanoes                      d) ocean ridges
- 3) An example of a transform fault that comes on-land: \_\_\_\_\_.  
 a) Cascadia subduction zone              b) San Andreas Fault  
 c) Mid-Atlantic ridge                        d) Gulf of California
- 4) Flat topped sea mounts are termed as \_\_\_\_\_.  
 a) Mesa    b) Guyots  
 c) Inselberg                                     d) Monadnock
- 5) The age of the oldest oceanic crust in any of the world's oceans is \_\_\_\_\_.  
 a) 70 million years                            b) 250 million years  
 c) 100 million years                         d) 180 million years
- 6) Which of the following are closing ocean basin?  
 a) Arabian sea                                 b) Red Sea  
 c) Andaman Sea                                d) Mediterranean Sea
- 7) Global transgression and regression cycle can be caused by \_\_\_\_\_.  
 a) Major tectonic event                      b) Meteoritic impact  
 c) Unusual lunar tide cycles                d) Major Tsunami event
- 8) Match the following test composition (listed in Group I) with the microfossil taxa (listed in Group II)  

<b>Group I</b>	<b>Group II</b>
P. Organic-walled	1. Radiolaria
Q. Siliceous	2. Conodont
R. Phosphatic	3. Foraminifera
S. Calcareous	4. Acritarch
a) P-4; Q-3; R-1; S-2	b) P-2; Q-1; R-4; S-3
c) P-4; Q-1; R-2; S-3	d) P-3; Q-4; R-1; S-2
- 9) When the Sun, Moon and Earth all are aligned, a \_\_\_\_\_ is formed.  
 a) Spring Tide                                 b) Neap tide  
 c) Long shore current                        d) Low tidal range

- 10) Which of the following affects the density of sea water?
  - a) Ocean Currents
  - b) Salinity
  - c) Hydrogen Bonds
  - d) Breakers
- 11) The average earth surface temperature \_\_\_\_\_.
  - a) 28°C
  - b) 32°C
  - c) 15°C
  - d) 22°C
- 12) Fastest moving ocean currents in world \_\_\_\_\_.
  - a) Gulf Stream current
  - b) Agulhas current
  - c) Brazil current
  - d) Kuroshio current
- 13) Ekman layer is characterized by \_\_\_\_\_.
  - a) constant wind direction at all height
  - b) constant wind speed at all height
  - c) turning of wind with height
  - d) increase in air temperature with height
- 14) An oceanic circulation driven by mechanical stirring, which transport heat, mass freshwater and other properties in the meridional / zonal direction is called \_\_\_\_\_.
  - a) Monsoon circulation
  - b) Atmospheric circulation
  - c) Thermocline circulation
  - d) Thermohaline circulation

**Q.2 A) Answer the following (Any Four) 08**

- 1) Convergent type plate boundary
- 2) Rodrigues triple junction
- 3) Continental slope
- 4) Carlsberg ridge
- 5) Siliceous ooze

**B) Write Notes on (Any Two) 06**

- 1) Tectonic Division of Himalaya
- 2) Estuarine circulation
- 3) Thermocline gradient

**Q.3 A) Answer the following (Any Two) 08**

- 1) Sea floor spreading.
- 2) Oceanic eddies.
- 3) Geostrophic motion.

**B) Answer the following (Any One) 06**

- 1) Note on oceanic sediments. Discus factor controlling for deposition and distribution of oceanic sediments.
- 2) Opening and closing of oceanic gateway and their significance with climate change during Cenozoic time.

**Q.4 A) Answer the following (Any Two) 10**

- 1) Discus orogeny: mechanism of Himalaya orogeny.
- 2) Ocean margin and its significance.
- 3) Ekman's theory.

**B) Answer the following (Any One) 04**

- 1) Indian sub-continent Craton and Mobile belt.
- 2) Sea level changes and its causes.

**Q.5 Answer the following (Any two)**

- a)** Define Estuary. Explain classification and nomenclature of estuaries with examples.
- b)** Discuss world ocean gyre. Explain India ocean coastal currents.
- c)** Explain with neat sketch diagram three cell model of global wind circulation. Brief note of Coriolis effects.

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**M.Sc.(Semester - III) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**ENGINEERING GEOLOGY AND MINING GEOLOGY**

Day & Date: Thursday, 07-11-2019  
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Q.1 Fill in the blanks by choosing correct alternatives given below.**

**14**

- 1) The impact toughness of the rock is calculated by the relationship \_\_\_\_\_.  
 a)  $P/h.a$  b)  $P/l.a$   
 c)  $F/l.a$  d) None of the above
- 2) Brazilian test is performed to determine \_\_\_\_\_.  
 a) Compressive strength of rock b) Tensile strength  
 c) Triaxial compressive strength d) Shearing strength
- 3) Most of the earthquake are occurring at \_\_\_\_\_.  
 a) Convergent plate boundaries b) None of the above  
 c) Divergent plate boundaries d) Both of the above
- 4) Vermiculite is an example of \_\_\_\_\_ aggregates.  
 a) Ultralight weight b) Normal weight  
 c) Lightweight d) Heavyweight
- 5) The point on the earth surface directly above the hypocenter is called as \_\_\_\_\_.  
 a) Focus b) Epicenter  
 c) Fault d) None of the above
- 6) Two methods used in mining are \_\_\_\_\_.  
 a) Surface mining and subsurface mining  
 b) Surface mining and open cast mining  
 c) Underground mining and underwater mining  
 d) None of the above
- 7) The complex slide in which the nature of movement is rotational and material involved is of mixed character \_\_\_\_\_.  
 a) Slump b) Creep  
 c) Solifluction d) Rock topple
- 8) Which of the following is not a rock discontinuity \_\_\_\_\_.  
 a) Faults b) Joints  
 c) Folds d) Landslides
- 9) Find out the odd one out \_\_\_\_\_.  
 a) Drag bit b) Diamond core bit  
 c) Tricone roller bit d) Percussion drilling
- 10) Quarries are generally \_\_\_\_\_.  
 a) Open pits b) Surface coal mines  
 c) Underground mines d) Explosive mines

- 11) Types of surface mining include \_\_\_\_\_.
  - a) Open pits only
  - b) Quarries only
  - c) Surface coal mines
  - d) All of the above
- 12) Which of the following bridge type has deck supported by arch action \_\_\_\_\_.
  - a) Suspension bridge
  - b) Truss bridge
  - c) Arch bridge
  - d) Cantilever bridge
- 13) In case of interlinking of rivers the peninsular component consist of \_\_\_\_\_ links.
  - a) 14
  - b) 16
  - c) 13
  - d) 10
- 14) When minerals are located too dip in the Earths subsurface then method used for mining is \_\_\_\_\_.
  - a) Open pit mining
  - b) Quarries
  - c) Surface mining
  - d) Subsurface mining

**Q.2 A) Answer the following question. (Any Four) 08**

- 1) What is manufactured sand?
- 2) Define placer deposits.
- 3) Define creep.
- 4) Compressive strength of rocks.
- 5) Define tunnels.

**B) Answer the following question. (Any Two) 06**

- 1) Draw the ideal diagram of bridge and describe various terms.
- 2) Write down the difference between intensity and magnitude of earthquake.
- 3) Properties of aggregates.

**Q.3 A) Answer the following question. (Any two) 08**

- 1) Write as note on open cast mining.
- 2) Construction of Tunnels in structurally deformed rocks.
- 3) Define mass movements. Classification of mass movements.

**B) Answer the following question. (Any One) 06**

- 1) What is drilling? Describe types of drilling.
- 2) Describe in brief the engineering properties of soil.

**Q.4 A) Answer the following question.(Any Two) 10**

- 1) Describe the problems of groundwater in engineering projects.
- 2) What are earthquakes? Describe the reservoir induced seismicity.
- 3) Mine restoration and mine safety.

**B) Answer the following question. (Any One) 04**

- 1) Slope stability analysis
- 2) Interlinking of rivers

**Q.5 Answer the following question (Any two) 14**

- a) Describe in brief the surface and subsurface methods of investigation.
- b) Explain with neat diagram various types of dams.
- c) Describe in brief mining hazards and mine diseases.

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**M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019**

**Applied Geology**

**ENVIRONMENTAL GEOLOGY AND DISASTER MANAGEMENT**

Day & Date: Monday, 04-11-2019  
Time: 03:00 PM To 05:30 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) Which of the following is not aim of environmental geology?
  - a) Minimizing environmental impacts
  - b) Mitigating exposure of natural hazards on humans
  - c) Minimizing or eliminating effects of pollution
  - d) Minimizing human population and urbanization
- 2) Green House gas is \_\_\_\_\_.
  - a) Nitrogen
  - b) Oxygen
  - c) Methane
  - d) Carbon dioxide
- 3) Pollution of water is responsible for.
  - a) Oil refineries
  - b) Paper factories
  - c) Sugar mills
  - d) All of the above
- 4) Which of the following is not an air pollutant?
  - a) Sulphur dioxide
  - b) Sewage
  - c) CFC's
  - d) SPM
- 5) Which one of the following does not contribute in producing acid rain.
  - a) Nitrogen dioxide
  - b) Nitrogen monoxide
  - c) Carbon monoxide
  - d) Sulphur dioxide
- 6) Which of the following is a biological method of disposal of municipal solid waste?
  - a) Land fills
  - b) Shredding
  - c) Pulverization
  - d) Composting
- 7) How are active liquids of nuclear waste disposed?
  - a) Stored in concrete tanks and buried underground
  - b) Stored in concrete tanks and buried in sea
  - c) Mixed with other chemicals and left into free atmosphere
  - d) They are reused and burnt away in gaseous fumes
- 8) Which of the following is used to estimate which areas will be inundated during a flood, based on river height information?
  - a) satellite and radar images
  - b) flood maps/floodplain hydraulic models
  - c) river gauging stations
  - d) all of the above
- 9) Urbanization usually results in an increase in flood frequency because.
  - a) less water is able to runoff in streams
  - b) less water is able to infiltrate into the ground, so instead is discharged rapidly into streams
  - c) more water is used by humans and then discharged to streams
  - d) rainfall is greater in urban areas than in rural areas

- 10) The tsunami that killed over 250,000 people in south and southeast Asia in 2004 was caused by \_\_\_\_\_.
- a) a volcanic explosion                      b) an earthquake  
c) a hurricane                                      d) a tropical storm
- 11) Land slide can be defined as the of slope \_\_\_\_\_.
- a) Downward movement  
b) Upward movement  
c) Outward movement  
d) Downward and Outward movement
- 12) As a tsunami approaches shallow water which of the following set of transformations occur?
- a) Wavelength increases, wave period decreases, and wave height stays the same  
b) Wavelength decreases, wave period decreases, and wave height increases  
c) Wavelength decreases, wave period increases, and wave height increases  
d) Wavelength decreases, waver period stays the same, and wave height increases
- 13) District solapur comes under which seismic zone of India.
- a) zone – I    b) zone – II  
c) zone – III    d) zone – IV
- 14) On 30 July 2014, a landslide occurred in one district of Maharashtra which is landslide prone areas is \_\_\_\_\_.
- a) Satara    b) Mumbai  
c) Pune    d) Sindudurg

- Q.2 A) Answer the following. (Any Four)    08**
- 1) Food chain  
2) Liquid waste  
3) Groins  
4) Define ecosystem.  
5) Ganga flood plain
- B) Write Notes. (Any Two)    06**
- 1) Active volcano in India  
2) Acid rain  
3) Hazardous waste
- Q.3 A) Answer the following. (Any Two)    08**
- 1) Mining and pollution  
2) Sources of waste  
3) Kedarnath Flood
- B) Answer the following. (Any One)    06**
- 1) Causes and controlling measures for draught.  
2) Describe use of remote sensing and GIS in natural disaster management.
- Q.4 A) Answer the following (Any Two)    10**
- 1) Biochemical cycle  
2) Causes and forecasting of flood  
3) Environment protection legislative in India



**B) Answer the following (Any One)**

**04**

- 1) Soil pollution
- 2) Coastal hazards

**Q.5 Answer the following (Any Two)**

**14**

- a) Explain impact of anthropogenic activity on water resources.
- b) Describe landslide hazard, causes, assessment and controlling measures.
- c) Note on history of Koyana Earthquake.

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**M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**REMOTE SENSING AND GIS**

Day & Date: Wednesday, 06-11-2019  
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Draw neat and labeled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 14**

- 1) SDI stands for \_\_\_\_\_.
 

a) Spatial Data Interface	b) Spatial Data Infrastructure
c) Spatial Data Intention	d) Spatial Data International
- 2) Which of the following rock has the highest reflectance?
 

a) Basalt	b) Diorite
c) Limestone	d) Arkose
- 3) The rotating or oscillating mirrors are used to scan the terrain in a series of lines, called scan lines, which are at right angles to the flight line, the scanner is called as \_\_\_\_\_.
 

i) whiskbroom scanner	ii) Pushbroom scanner
iii) Across track scanner	iv) Along track scanner
a) Only i)	b) Both i) and iii)
c) Both ii) and iv)	d) Both i) and iv)
- 4) Geostationary orbit is a \_\_\_\_\_.
 

a) low earth orbit	b) medium earth orbits
c) high earth orbits	d) None of the above.
- 5) The aerial photographs are clicked having \_\_\_\_\_ percent overlap and \_\_\_\_\_ percent side lap.
 

a) 60 and 40	b) 60 and 30
c) 30 and 60	d) 30 and 70
- 6) The texture developed due to alluvial deposits in desertic region, on medium scale photograph is \_\_\_\_\_.
 

a) Smooth texture	b) Rough texture
c) Mottled texture	d) Crisscross texture
- 7) The Most widely used instrument for measuring correct horizontal distances and determining height of the objects from the paper prints of aerial photographs.
 

a) Stereoscope	b) Parallax bar
c) Sketch master	d) Kelsh plotter
- 8) CARTOSAT 2 is a \_\_\_\_\_ satellite.
 

a) Geo stationary	b) Polar
c) Near polar	d) sun synchronous
- 9) Find out the odd one out.
 

a) Photographic tone	b) Photographic texture
c) Shadows	d) Nadir point

- 10) \_\_\_\_\_ is resulted when the camera axis is not vertical.
  - a) Tip
  - b) Tilt
  - c) Drift
  - d) Crab
- 11) "Pixel" is the smallest unit of \_\_\_\_\_.
  - a) An analogue image
  - b) A digital image
  - c) A photographic film
  - d) A photograph
- 12) GIS, Remote Sensing and GPS technologies are:
  - a) Manual, spatial and digital
  - b) Generic, digital and spatial
  - c) Analogue, manual and spatial
  - d) Generic, analogue and spatial
- 13) GIS deals with which type of data.
  - a) Numeric data
  - b) Spatial data
  - c) Binary data
  - d) Complex data
- 14) In case of \_\_\_\_\_ data models, different features can be separated to form layers.
  - a) Vector data
  - b) Raster data
  - c) Non spatial data models
  - d) None of the above

- Q.2 A) Answer any four of the following questions. 08**
- 1) What is overlap and side lap in case of aerial photographs?
  - 2) Define Albido.
  - 3) How can we distinguish between healthy and diseased vegetation.
  - 4) Define Stereoscope.
  - 5) Energy Balance Equation.
- B) Answer any two of the following questions. 06**
- 1) What is scattering of light? Describe its types.
  - 2) Write a note on orbits of satellites.
  - 3) Write a note on raster data models.
- Q.3 A) Answer any two of the following questions. 08**
- 1) Describe in detail the discrepancies in aerial photography.
  - 2) Describe the photo geologic characteristics of the rocks.
  - 3) Georeferencing.
- B) Answer any one of the following questions. 06**
- 1) What are the various geometric characteristics of aerial photographs? Describe it in detail.
  - 2) Define GIS. Explain its components.
- Q.4 A) Answer any two of the following questions. 10**
- 1) Write a note on Indian Remote Sensing.
  - 2) Describe various platforms used in Remote Sensing.
  - 3) Application of Remote sensing in Groundwater exploration.
- B) Answer any one of the following questions. 04**
- 1) Differentiate between aerial photography and topographic maps.
  - 2) Describe the multi spectral scanners.
- Q.5 Answer any two of the following questions. 14**
- a) What is Global Positioning Systems? Discuss its uses.
  - b) Interaction between EMR and Earth Surface.
  - c) Write in detail Network Analysis.

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**M.Sc.(Semester - IV) (CBCS) Examination Oct/Nov-2019**  
**Applied Geology**  
**FUEL GEOLOGY**

Day & Date: Friday, 08-11-2019  
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Draw neat and labelled diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below.**

**14**

- 1) Which one of the following is green energy?
 

a) Thermal power plant	b) Nuclear power plant
c) Oil refining plant	d) Hydro power plant
- 2) What type of energy is not a indigenous?
 

a) Solar energy	b) Geothermal energy
c) Hydrothermal energy	d) Nuclear energy
- 3) Which one of the following produce maximum conventional energy in India?
 

a) Thermal	b) Solar
c) Nuclear	d) Tidal
- 4) Pick out the odd one \_\_\_\_\_.
 

a) Wood	b) Coal
c) Solar	d) Rock oil
- 5) Liquefied petroleum gas (LPG) consist mainly \_\_\_\_\_.
 

a) Propane and Butane	b) Methane and Ethane
c) Methane and Butane	d) Ethane and Propane
- 6) The petroleum deposits of Digboi oil field occur in the rock sequences of \_\_\_\_\_.
 

a) Eocene age	b) Miocene age
c) Oligocene age	d) Palaeocene age
- 7) Which geological era have maximum reserves of oil and gas?
 

a) Mesozoic rocks	b) Tertiary rocks
c) Palaeozoic rocks	d) Proterozoic rocks
- 8) Crude oil density in degree API (American Petroleum Institute) is a measure of viscosity. The value of 10 API is of \_\_\_\_\_.
 

a) Water	b) Average crude
c) Lighter crude	d) Heavy crude
- 9) Coking coal in India is found in \_\_\_\_\_.
 

a) Neyveli, Tamil Nadu	b) Jharia, Jharkhand
c) Palana, Rajasthan	d) Garampani, Meghalaya
- 10) The age of Lignite deposits in Neyveli \_\_\_\_\_.
 

a) Eocene	b) Miocene
c) Oligocene	d) Permian

- 11) Which of the following variety of coal has least H/C ratio?  
a) Peat   b) Lignite  
c) Bituminous   d) Anthracite
- 12) Choose the correct combination for ore and location of its deposits  
\_\_\_\_\_.  
a) Uranium-Jaduguda   b) Coal-Khetri  
c) Gold-Panna   d) Petroleum-Cuddupah
- 13) Which one of the following is not nuclear mineral?  
a) Betafine   b) Thorianite  
c) Jadeite   d) Allanite
- 14) Which state have maximum uranium deposits?  
a) Maharashtra   b) Jharkhand  
c) Andhra Pradesh   d) Rajasthan

- Q.2 A) Answer the following questions. (Any Four)   08**  
1) Geothermal energy  
2) Kerosene  
3) Boghead coal  
4) BTU  
5) Radioactivity
- B) Write Notes. (Any Two)   06**  
1) Renewable energy  
2) K-G oil field  
3) Composition of hydrocarbon
- Q.3 A) Answer the following questions. (Any Two)   08**  
1) Types of fuel.  
2) Note on gas hydrates.  
3) Coal bed methane.
- B) Answer the following questions. (Any One)   06**  
1) Status of non-conventional energy resource in India.  
2) Explain radiometric surveying methods.
- Q.4 A) Answer the following questions. (Any Two)   10**  
1) Role of fuel in national development.  
2) Note on enhanced oil recovery methods.  
3) Nuclear waste management.
- B) Answer the following questions. (Any One)   04**  
1) Coal mines of Maharashtra.  
2) Primary migration of oil.
- Q.5 Answer the following questions. (Any Two)   14**  
**a)** Explain various types of oil traps.  
**b)** Explain green field exploration of coal.  
**c)** Nature and types of uranium deposits and their occurrence.