

**ES 1101**

Mid-Term Examination, 2018

Full Marks: 40

Time: 1 Hour; **Give your answers in the last page**

**Question I**

In which of the geological environments (1-5) would you expect to find each of the following (A-I) ? Please note

- There may be more than one features in each geological environment
- Same feature may repeat in different geological environments

(A) normal faults

(B) deep earthquakes

(C) intraplate earthquakes

(D) a mid-ocean ridge

(E) sea-floor spreading

(F) reverse faults

(G) a volcanic island arc

(H) a deep-sea trench

(I) a Benioff zone

\_\_\_\_\_ (1) subduction zone

\_\_\_\_\_ (2) plate interior

\_\_\_\_\_ (3) continent-continent collision

\_\_\_\_\_ (4) continental rift zone

\_\_\_\_\_ (5) divergent plate boundary

5x2=10

## Question II

- A. Crystals with three orthogonal and unequal axes belong to:
- (a) Orthorhombic system
  - (b) Triclinic system
  - (c) Isometric system
- B. Crystals with three inclined and unequal axes belong to:
- (a) Monoclinic system
  - (b) Triclinic system
  - (c) Tetragonal system
- C. When two oxygen of a  $\text{SiO}_4$  tetrahedron are linked with other two oxygen in the adjoining tetrahedron, the structure is called:
- (a) Nesosilicate
  - (b) Chain silicate
  - (c) Sheet silicate
- D. Alpha to beta olivine transition takes place at a depth of
- (a) 40 km depth
  - (b) 410 km depth
  - (c) 660 km depth
- E. Conversion of graphite to diamond should happen at a -----level beneath sub-oceanic mantle than beneath sub-continental mantle
- (a) Shallower
  - (b) Deeper
  - (c) The same levels
- F. The polymorph of quartz on the surface of the earth is
- (a) Alpha-quartz

- (b) Beta- quartz
- (c) Coesite

G. Which statement is **not** correct:

Isomorphous substitution is favored by -----

- (a) same charge of the substituting ions
- (b) similar ionic size
- (c) high contrast in electronegativity

H. Which statement is **not** correct for Primary waves

- (a) they travel only along the surface
- (b) they can pass through the outer core
- (c) they tell us about the internal structure of the Earth

I. The major sources of energy for the Earth is:

- (a) Primordial energy, radioactive energy and solar radiation
- (b) Volcanic eruptions, radioactive energy and solar radiation
- (c) Primordial energy, volcanic eruptions and solar radiation

J. Velocity of P-wave is dependent on:

- a) Bulk modulus, shear modulus and Young's modulus
- b) Bulk modulus, density and Young's modulus
- c) Bulk modulus, shear modulus and density

K. Hanging wall goes up relative to footwall in case of a -----

- (a) Normal fault
- (b) Reverse fault
- (c) Strike-slip fault

L. A fold with the oldest rock in the core is called

- (a) Symmetrical fold
- (b) Syncline
- (c) Anticline

- M. The geometry of a fault plane is ascertained by the following:
- a) Strike and plunge
  - (b) Strike and dip
  - (c) Dip and plunge
- N. An intrusive igneous rock cutting across the host rock structure is called
- (a) sill
  - (b) dyke
  - (c) lopolith
- O. Viscosity of magma is dependent on
- (a) Alumina content
  - (b) Silica content
  - (c) Cooling history
- P. An igneous rock with two contrasting sizes of crystals can form by
- (a) Rapid cooling
  - (b) Slow upward movement of magma
  - (c) Two stage crystallization
- Q. Percentage of silica in igneous rocks is correlated with temperature of crystallization
- (a) Positively
  - (b) Negatively
  - (c) No correlation
- R. Settling of crystals in a magma chamber can be caused by
- (a) Assimilation
  - (b) Fractional crystallization
  - (c) Magma mixing
- S. Fumarole is a type of
- (a) Crater
  - (b) Conduit
  - (c) Vent
- T. Which type of convergent plate boundary does **not** have significant volcanism
- (a) Continent-continent
  - (b) Ocean-ocean
  - (c) Ocean-continent
- U. Which type of volcano does **not** pour out lava

- (a) shield volcano
- (b) Composite cone
- (c) Cinder cone

V. Pillow lava is indicative of

- (a) Sub-aerial extrusion
- (b) Sub-aqueous extrusion
- (c) None of the above

X. Which of the following is associated with the least explosive volcanism?

- a) Mafic composition,
- b) Felsic composition,
- c) High silica content,

24x1=24

### Question III

Fill up the blanks:

- A. Minerals such as \_\_\_\_\_ have high temperature of crystallization.
  - a) Pyroxene & Olivine, b) Feldspar & Muscovite, c) Quartz & Feldspar, d) All of them
- B. Mafic rock tends to have higher \_\_\_\_\_ compared to felsic rocks.
  - a) Melting point, b) Silica content, c) Viscosity, d) All of them
- C. The hinge line is----- in non-cylindrical folds
  - (a) Straight, (b) curved, (c) vertical, (d) horizontal
- D. Mid-ocean ridges are expected to be associated with -----
  - (a) Reverse fault, (b) strike-slip fault, (c) normal fault, (d) symmetrical fold
- E. The most explosive volcanoes are associated with -----
  - a) Divergent boundaries, b) Convergent boundaries, c) Plume volcanism, d) All of the above
- F. Most abundant elements in the solar system have -----
  - (a) Odd N + odd Z
  - (b) Odd N + even Z
  - (c) Even N + odd Z
  - (d) Even N + even Z

6x1=6

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Mid-term Exam 2018

Name..... Roll No.....

Question I	
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Question II	
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Question III	
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