

MASTER OF SCIENCE EXAMINATION, 2018

(2nd Year, 1st Semester)

APPLIED GEOLOGY

Ore Deposit

Paper - IX

Time : Two hours

Full Marks : 50

Use separate answer script for each group.

GROUP - A (40 marks)

1. Answer any **five** questions from the following : 5x5=25
 - (a) Using necessary sketch compare the release of connate fluid and metamorphic fluid at different stages during burial and prograde metamorphism of clay-rich sediments. What are the different processes that help in fluid migration in the crust ? 3+2
 - (b) “Hydrothermal mineralization formed by evaporite-derived fluid will be characterized by ubiquitous Fe oxide, sparse Fe sulphide, sulphides of least soluble chalcophile elements, and very rare or no Pb-Zn sulphides”–accept or reject with reason. Answer with sketches. 5
 - (c) “Hydrothermal alteration caused by magmatic-hydrothermal fluid, derived from high sulfidation and high fO_2 melt will be dominated by potassic and acidic alteration”–explain the statement. 5

(Turn over)

(2)

- (d) Using a suitable sketch compare the depth of origin (depth of melt generation by partial melting), depth of emplacement and the mechanism of fluid boiling of dioritic melts with those of granitic melts. 5
- (e) What are S-type and I-type granites ? Which type of granites is likely to form porphyry Cu-Mo and porphyry Sn-W deposits, respectively, and why ? 1+4
- (f) What is Quartz-Pebble-Conglomerate (QPC)-type uranium deposit ? What are the textural, geochemical and geochronological evidences in favour of the palaeo-placer model for genesis of such deposits ? 1+4
- (g) Write a short note on the host rocks, hydrothermal alterations, ore mineralogy and ages of uranium mineralization in the Singhbhum shear zone, eastern India. 5
- (h) What are eluvial and colluvial placers ? Discuss the favourable conditions that have helped in the formation of huge beach placer deposits in India. 2+3

2. Answer **q.no. (d)** and any **two** questions :

- (a) How did changes in atmospheric-hydrospheric condition take place during Precambrian time ? Discuss in the light of Fe-Mn oxide deposits rock-record in the Transvaal Super Group. 3+2=5

(3)

- (b) What are the characteristics of Volcanic Hosted Massive Sulphide deposits ? Give a brief account of Cyprus-type Pb-Zn deposit. 2.5+2.5=5
- (c) Explain the conditions in which Proterozoic manganese ores were deposited. Briefly discuss manganese deposits of the Gangpur Group of rocks. 2+3=5
- (d) Write short notes on (any **two**) 2.5x2=5
- (i) Elemental enrichment of manganese nodules rested on suboxic diagenetic substrate.
- (ii) Pb-Zn deposit of Broken Hill, Australia.
- (iii) Mn deposits of Penganga Group, India.

GROUP - B (10 marks)

3. Answer any **two** questions : 5x2=10
- (a) 'There is more gibbsite but less diasporite in younger bauxite deposits' – justify and discuss with necessary sketches. 5
- (b) What are the characteristic properties of refractory material ? Give a brief account of *fire-clay refractories*. 2+3
- (c) What is 'Fuller's Earth' ? What are the characteristic properties of ceramic clay minerals ? 2+3