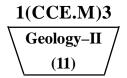
Roll No.

Total No. of Pages: 3



Time: Three Hours] [Maximum Marks: 300

INSTRUCTIONS

- (i) Answers must be written in English.
- (ii) All questions carry equal marks.
- (iii) The answer to each question or part thereof should begin on a fresh page.
- (iv) Your answer should be precise and coherent.
- (v) The part/parts of the same question must be answered together and should not be interposed between answers to other questions.
- (vi) Candidates should attempt **six** questions, selecting **one** question from each Section.
- (vii) If you encounter any typographical error, please read it as it appears in the text-book.
- (viii) Candidates are in their own interest advised to go through the General Instructions on the back side of the title page of the Answer Script for strict adherence.
- (ix) No continuation sheets shall be provided to any candidate under any circumstances.

- (x) Candidates shall put a cross (x) on blank pages of Answer Script.
- (xi) No blank page be left in between answer to various questions.
- (xii) No programmable Calculator is allowed.
- (xiii) No stencil (with different markings) is allowed.

SECTION-A

- 1. Enumerate the essential differences between crystalline and noncrystalline substances. Add a note on lattice symmetry.
- 2. Write notes on any **two** of the following:
 - (a) International system of crystallographic notation
 - (b) Crystal imperfections
 - (c) X- ray crystallography.

SECTION-B

- Briefly explain the various optical and physical properties of minerals that can be observed in thin sections under a transmitting polarizing microscope.
- 4. Write notes on the following:
 - (a) Isotropism
 - (b) Pleochroism

SECTION-C

- 5. Describe the different kinds of interatomic bonds that may form between different atoms in a crystal lattice. Give examples.
- 6. Write detailed notes on any two of the following:
 - (a) Classification of silicates
 - (b) Polymorphism
 - (c) Pseudomorphism.

SECTION-D

- What is magmatic differentiation? Explain, with examples, as to how differential crystallization of a magma may give rise to a variety of igneous rocks.
- 8. What is meant by 'Texture of a rock'? Describe the important textures of igneous rocks and their genetic significances.
- 9. Describe the petrography and petrogenesis of some important metamorphic rocks.

SECTION-E

- 10. Briefly describe the important processes of ore formation.
- 11. Write notes on any **two** of the following:
 - (a) Forms and structure of ore deposits
 - (b) Metallogenic epochs
 - (c) Hydrocarbon resources of India.

SECTION-F

- 12. Describe the various methods used for the exploration of metallic mineral deposits.
- 13. Write notes on any two of the following:
 - (a) Ore dressing and beneficiation
 - (b) Application of geology in civil engineering applications
 - (c) Use of aerial photographs in geological investigations.

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