**Seat No: _____** **Enrollment No: _____**

# PARUL UNIVERSITY

## FACULTY OF APPLIED SCIENCE

## M.Sc., Winter 2019-20 Examination

**Semester: 1** **Date: 04/12/2019**
**Subject Code: 11211104** **Time: 10:30 am to 01:00 pm**
**Subject Name: Metamorphic Petrology** **Total Marks: 60**

**Instructions:**
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1. A) Essay type/ Brief note (4x2) (Each of 04 marks)** **(08)**
(a) Write a short note on High P/T facies.
(b) Write a note on Barrovian zone.

**Q.1. B) Answer the following questions (Any two)**
(a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) **(04)**
1. What is pro grade metamorphism?
2. What are migmatites? How are they formed?

(b) Short note on limits of metamorphism. **(04)**
(c) What are the different mineral assembleges formed at low temperatures? Also write the facies of low temperatures . **(04)**

**Q.2. A) Answer the following questions.**
(a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) **(04)**
1. Define the term porphyroblastic with suitable example.
2. Define metamorphic grade.

(b) Short note hydrothermal metamorphism. **(04)**

**Q.2. B) Answer the following questions (Any two)**
(a) Short note/ Multiple choice questions. (Each of 01 marks) **(03)**
1. _____is the rock formed as product of contact metamorphism and is typically fine grained
   a) Slate b) Hornfels c) Mica schist d) Carbonatite
2. ____metamorphism is the type of metamorphism associated with convergent plate margins
   a) Contact b) Orogenic c) Burial d) Pyrometamorphism
3. The new mineral that characterizes any particular zone is termed as _____ mineral
   a) Marker b) Indicator c) Index d) recrystallized

(b) Short note on contact metamorphism. **(03)**
(c) What are ortho and para protoliths? **(03)**

**Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks)** **(08)**
(a) Describe the agents of metamorphism in details.
(b) Discuss the regional metamorphism of Scottish highlands.

**Q.3. B) Answer the following questions (Any two)**
(a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) **(04)**
1. Types of protoliths.
2. Foliated rocks.

(b) Pyrometamorphism **(04)**
(c) Write a note on Metamorphic facies. **(04)**

**Q.4. A) Answer the following questions.**
(a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) **(04)**
1. When substantial chemical changes accompanies metamorphism, the process is known as ____.
2. _____ Metamorphism refers to the changes in a rock that accompany increasing metamorphic grade.

(b) Short note on schistosity and gneissosity. **(04)**

**Q.4. B) Answer the following questions (Any two)**
(a) Short note/ Multiple choice questions. (Each of 01 marks) **(03)**
1. ___ is the calc- silica meatsomatized rock formed by contact metamorphism of carbonate rock
   a) Granofels b) Amphibolite c) Skarn d) Migmatite
2. _____ is the medium P/T facies
   a) Amphibolite b) Greenschist c) Eclogite d) Zeolite
3. Franciscan orogeny is an example of _____ metamorphism
   a) High P Low T b)High T Low P c)High P High T d)Low P High T

(b) Short note on Foliation and Lineation. **(03)**
(c) Short note on Recrsytallization. **(03)**