

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- VII (New) EXAMINATION – WINTER 2019

Subject Code: 2172207

Date: 30/11/2019

Subject Name: Rock Fragmentation

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1** (a) Explain the purpose of drilling & factors influencing the selection of drill machine. **03**
 (b) Discuss the type of drilling methods based on their principle of working. **04**
 (c) Define drillability and explain the four phases of rock breakage during percussive drilling. **07**
- Q.2** (a) Write a note on ANFO explosive. **03**
 (b) Explain the principle of operation of jack hammer drill used in underground coal mining. **04**
 (c) Define explosive & its basic composition. Briefly explain the properties of explosive. **07**
- OR**
- (c) Explain different types of drill bits used in drilling with neat sketch. **07**
- Q.3** (a) Differentiate between low explosive & high explosive with suitable examples. **03**
 (b) Write a note on down the hole hammer drill machine. **04**
 (c) A project in granite rock will have an average bench height of 20 feet. An explosive having a specific gravity of 1.2 has been proposed. A drill machine can easily drill 3.0 inch diameter of holes. Assume diameter of explosive will be 2.5 inch and delay blasting technique will be used. Develop a blast design for the project. Take specific gravity of granite is 2.8. **07**
- OR**
- Q.3** (a) What do you mean by safety fuse and detonating fuse? **03**
 (b) Differentiate between the term slurry explosive and emulsion explosive. **04**
 (c) What are the blast design parameters? Explain briefly. **07**
- Q.4** (a) Explain permitted explosive and its type **03**
 (b) What are electric and non-electric methods of blasting system? **04**
 (c) Write note on Hydraulic Drilling and Long Hole Drilling. **07**
- OR**
- Q.4** (a) Write a note on wagon drill machine. **03**
 (b) Explain delay detonator and its type with neat sketches. **04**
 (c) What do you mean by powder factor? **07**
 Calculate the powder factor, if the bench height is 6.5 m, subgrade drilling is 0.3 m, stemming height is 1.5 m, burden is 2 m and spacing is 3 m. Take specific gravity of explosive is 1.2 and loading rate of explosive per meter is 7.5 kg.
- Q.5** (a) What do you mean by boring in rocks? **03**
 (b) Write the advantage and disadvantage of delay blasting technique. **04**
 (c) Explain the recent developments in explosive and blasting techniques. **07**
- OR**
- Q.5** (a) Write a short note on nuclear blasting. **03**
 (b) Explain novel methods of drilling. **04**
 (c) What is ground vibration and air blast? Explain its causes and impacts. **07**
