Printed Pages : 4

Roll No.

339651(39)

BE (6th Semester)
Examination, April-May, 2016

(New Scheme)

Blasting Engineering

Time Allowed : 3 hours *Maximum Marks* : 80
Minimum Pass Marks : 28

Note : **(*i*) Attempt all questions. Part (*a*) is compulsory and attempt any two parts from (*b*), (*c*) and (*d*) in each question.**

(*ii*) The figures in the right-hand margin indicate marks.

Unit - I

1. (*a*) Define high explosive. 2

(*b*) Suggest and justify a suitable classification of commercial explosive for use in a mine and tabulate the comparisons amongst ANFO, SMS and SMF explosives. 7

(*c*) What is bulk explosive system? What are the merits of this system over cartridge system? 7

(*d*) What are Emulsion Explosives? Discuss their important properties. Also give a typical composition of this explosive. 7

Unit - II

2. (*a*) Give a suitable classification of all types of detonators. 2

(*b*) Illustrate various exploders used in electric firing of blasting circuits and distinguish it by Mains Firing System. 7

(*c*) Illustrate Non-electric initiation of explosives and compare it with detonating fuse. 7

(*d*) Explain why : 7

(*i*) Detonators are stored in cross-leg (short circuited) conditions

(*ii*) The bottom of the detonators are pressed upward

Unit - III

3. (*a*) What do you understand by "Decoupling" in reference to blasting? 2

(*b*) In an Opencast Mine, bench blasting is conducted, using ANFO having density of 800 kg/m^3. The specific gravity of rock is 2.5, hole diameter is 100 mm and spacing to burden ratio is 1.3. The charge length of each blast hole is 80% of the hole length.

For a desired powder factor of 0.48 kg/ tonne. Calculate the spacing and Burden of the blast pattern in m. 7

(*c*) What are the secondary blasting techniques? Estimate the powder factor in case of secondary blasting for sandstone, hematite and limestone. 7

(*d*) Define (any **three**) : 7

(*i*) Spacing

(*ii*) Burden

(*iii*) Decking

(*iv*) Inclined hole drilling

Unit - IV

4. (*a*) Draw a neat sketch of series and parallel connections of the detonators. 2

(*b*) Explain the procedure to be adopted to deal with a misfire shot in underground coal face. 7

(*c*) Illustrate various types of blasting cuts as prevalent in underground coal mines for Blasting off the solid, with specific notes on merits and limitations of each type. 7

(*d*) 20 plain detonators in series, each of 2Ω resistance, are fired by a D.C. exploder supplying a current of 1.25A. If 250 mJ energy is spent to fire the detonators, calculate time required in millisecond after detonator initiation. 7

Unit - V

5. (*a*) Define "Over-break". 2

(*b*) Explain various causes of noise and flyrock generation in bench blasting. Further discuss measure to control overbreak in underground operations by smooth blasting technique. 7

(*c*) What is blast vibration? Briefly explain the danger of Q-wave (Love-wave) forms. Further discuss various empirical approaches used for ground vibration prediction. 7

(*d*) Discuss the role of shock wave pressure and scabbing mechanism in rock fragmentation by blasting. 7