Practice Test for GATE Mining

1) In a room and pillar stope, bench blasting is conducted using ANFO having density of 800 kg/m3. 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 , the spacing and burden of the blast pattern in m respectively are ----- & -----.

a) 2.0, 2.6
b) 2.3, 1.8
c) 5.2, 4.0
d) 1.3, 1.0

2) A surface mine blast design has 9 holes in a row, each of 8 m length and 200 mm diameter. The spacing and burden are 6 m and 5 m respectively. The length of subgrade drilling is 1 m and the density of in-situ rock is 2.43 tonne/m3. Considering an explosive density of 0.9 tonne/m3 and the stemming length of 2 m. The powder factor from the blast in tonne/kg is ----.

a) 4.12
b) 4.00
c) 3.86
d) 3.01

3) In an overburden bench of an iron ore mine the following data were found: Height of the bench = 10 m, Burden = 4 m, Spacing = 3 m, Sub-grade drilling length = 1 m, Collar Stemming length = 3 m. If the diameter of the explosive column is 150 mm and the specific gravity of the explosive and that of rock are 0.9 and 2.4 respectively, the powder factor in tonne/kg will be ----.

a) 3.29
b) 4.98
c) 2.26
d) 4.53

4) From a hard rock open pit mine, the following data is available. Burden = 3 m, Spacing = 4 m, Bench height = 12 m, Sub-grade drilling = 1 m, Collar stemming = 4 m, Diameter of the hole = 150 mm, Density of the rock = 2500 kg/m3, Density of explosive = 800 kg/m3 . The powder factor in kg/tonne is -----.

a) 0.314
b) 0.353
c) 2.833
d) 3.183

5) A surface mine blast design has 9 holes in a row, each of 8 m length and 200 mm diameter. The spacing and burden are 6 m and 5 m respectively. The length of sub-garde drilling is 1 m and the density of in-situ rock is 2.43 tonne/m3 . Assuming no back break, the output per blast in tonne is ----.

a) 4593
b) 5905
c) 6124
d) 6299

6) Data related to explosives and blasthole are given below. Assuming 1 Kcal = 4.2 kJ. Diameter of the borehole = 200 mm, Charge length = 8 m, Density of ANFO = 0.8 g/cc, Heat of explosion = 912 cal/g, Velocity of Detonation = 4500 m/s, Initiation = Bottom,The power of the explosive in GW in the blast hole is -----.

a) 0.54
b) 0.43
c) 0.62
d) 0.48

7) 20,000 tonne of Iron ore has to be excavated by a single blasting. Thus, holes are drilled to place explosives inside them. Each hole is expected to blast nearly 200 m3 of iron ore. The Iron ore has a density of 5 g/cc (5 gram/ cubic centimeter). So, find out the number of holes required to be drilled to achieve this result.

a) 30
b) 20
c) 25
d) 35

8) A driller is drilling 20 numbers of holes of 10 m depth with a diameter of 150 mm. It has been planned to fill each hole up to a height of 8 m with the explosives. The density of that explosive is 0.8 g/cc. Find the amount of explosives required in terms of kilograms.

a) 2261
b) 2382
c) 2564
d) 2270

9) An emulsion explosive of specific gravity 1.25 is used for blasting in an iron ore formation having P-wave velocity of 3000 m/s and specific gravity of 3.20. For an explosive impedance to rock impedance ratio of 0.5, the desired velocity of detonation of the explosive in m/s is ----

a) 3870
b) 4280
c) 3840
d) 5280

10) The absolute amount of energy and density of a booster and ANFO are given below:

Explosive Type	Energy (Cal/g)	Density (g/cc)
Booster	4200	1.25
ANFO	912	0.81

The relative bulk strength of booster with respect to ANFO of booster is ------.

a) 7.48
b) 8.15
c) 7.10
d) 7.32

****