

Practice Test 2 for GATE Mining

- 1) A blast is carried out in a coal mine bench of height 12 m with burden and spacing 4.5 m and 9 m respectively. The drilling is carried out by a 250 mm diameter DTH drill with a sub-grade drilling of 2 m. Explosive used for this blast is ANFO with specific gravity of 0.8. There are 40 numbers of holes blasted with a stemming height of 4 m. Find out the total quantity of explosives used for this blast in kg.
- a) 15650
 - b) 15700
 - c) 15750
 - d) 15800
- 2) For a delay blasting of 10 circuits, a sequential timer is set on 25 ms between circuit initiations. If the nominal firing time of a detonator is 400 ms, the last hole will be blasted at ----- ms.
- a) 650
 - b) 400
 - c) 625
 - d) 500
- 3) Find out the production (in tonne) from the given blast design. Number of holes = 30
Burden = 3 m, Spacing = 4 m, Bench height = 10 m, Charge column length = 8 m,
Stemming = 3 m, Linear charge concentration = 18 kg/m, Unit weight of the blasted material = 2.5 tonne/m³
- a) 9000
 - b) 9200
 - c) 8500
 - d) 8000
- 4) In a 4.2 m wide and 3.0 m high gallery in a coal seam, twelve shot holes are blasted per round. The holes are charged with 2 explosive cartridges of 435 g each. If the powder factor of the blast is 2.2 tonne/kg and specific gravity of coal is 1.4, the pull per round of blast in m is -----.
- a) 1.30
 - b) 1.35
 - c) 1.32
 - d) 1.36

5) In a typical surface blast, the charge weight per delay was 100 kg and the vibration reading was taken at a distance 200 m behind the last row of the blastholes. Then, find out the square root scaling distance?

- a) 20
- b) 25
- c) 30
- d) 15

6) A blast vibration was monitored by using a seismograph and the Peak Particle Velocity (PPV) obtained at time 't' in respective longitudinal, transverse and vertical axis are as follows:

PPV	Transverse	Longitudinal	Vertical
mm/s	18.92	21.21	22.10

Find the Vector Sum (VS) at time 't' in mm/s .

- a) 36
 - b) 35
 - c) 34
 - d) 37
- 7) Given the following information regarding a drilling application in a hard rock mine, select the correct drill jumbo required for a mobile, track mounted drill rig with a capacity of 1 to 4 drill booms:

Mining Method	Stope and Pillar Mining
Stope Face	Height = 6 m and Width = 7.2 m
Drill power available	Pneumatic Percussion
Drill Bits	57 mm, Carbide
Rock	Denver Granite Gneiss
Penetration Rate	11.9 mm/sec
Blasting Factor	0.632 m ² /hole
Depth of rounds or holes	4.8 m (100 % pull is achieved)
Delay timing in drilling/ hole	2.40 minute

Drill rounds per day	3
Allowable drilling time/ round	4.0 hr
Tonnage Factor	0.437 m ³ / tonne

The charge length per hole is 4 m, explosive used is ANFO with specific gravity 0.8. Determine the tonnes of rock broken, drilling factor and powder factor.

- 8) A surface coal mine currently in operation plans to undertake additional blasting loading ANFO with a density of 0.8 g/cm³. Additional relevant parameters with respect to this proposed shot are: Burden = 28 feet, Spacing = 33 feet, Bench height (or hole depth) = 135 feet, Hole diameter = 11 inches, Stemming = 30 feet, and No. of holes = 200. In pounds of explosives per bank cubic yard of rock, what will the powder factor for a single one of these boreholes?
- a) 0.25
b) 0.50
c) 0.75
d) 0.80
- 9) In a typical surface blast, the charge weight per delay was 100 kg and the vibration reading was taken at a distance 200 m behind the last row of the blastholes. Then, find out the square root scaling distance?
- a) 20
b) 25
c) 15
d) 10
- 10) 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) 3850
b) 3564
c) 3845
d) 3840
