

**UNIVERSITY OF PETROLEUM
AND ENERGY STUDIES**



End Semester Examination – December, 2017

Program/course: B.TECH/ MINING ENGG
Subject: MINE DEVELOPMENT
Code : MIEG 222
No. of page/s: 03

Semester – III
Max. Marks : 100
Duration : 3 Hrs

Instructions:

- a. Answers must carry the supporting material such as equations and diagrams, wherever necessary
- b. Section-A is compulsory

Section A

20Marks.

1.
 - i) What is blast casting & its specifications (3+2=5 marks)
 - ii) Ultra-safe explosives comes under which type & what is their specialty (5 marks)
 - iii) The suitability of freezing method of sinking is for which type of strata & what is the process involved? (5 marks)
 - iv) Sectioned & delay detonators are different w.r.to their initiation system, illustrate with proper arrangement. (5 marks)

Section B

40 Marks

2. What is the difference between pop & plaster shooting (10 marks)
3. Summarize the usefulness of stemming (05 marks)
4. Each question carries 01 mark (01*5=5 marks)
 - a) The bucket used for removal of debris in shaft sinking is known as -----
 - b) Max. depth encountered using wireline drill is -----
 - c) The finished diameter of shaft varies between ----- & -----
 - d) Plaster shooting is an example of -----
 - e) Geodyne is a -----type explosive (T/F)

5. Match the following & form the desired **statement** (2*5=10 Marks)

A

B

Fly rock

Plain detonator

Line Drill

stemming > 3mtrs

Sheath explosive

Permadyne

ASA

No charge

Permissible explosive

Cushion blasting

6. Find out the capacity of MAGAZINE for **u/g** coal & metal mine with following set of information (10 Marks)

No. of working day=25/ month

1 ton of explosive requires 2m² area. Daily production is X tons

P=Realistic production of ore / kgs of explosive

Or

Dynamite having specific gravity of 1.3 is used for excavation in granitic rock.

The diameter of dynamite cartridge is 2.75 & 4.5 respectively.

Specific gravity of granite= 2.8

If all the specifications are meant for bench of 13fts height, then find out the Stiffness ratio. Match the stiffness ratio with the standard table & specify which dynamite can be used for blasting? (10 Marks)

Section C

Each question carries 20 Marks

40 Marks

7. A) What stiffness ratio stands for? How it is related to the detrimental effects of blasting (20 marks)

or

B) Burden/ Corrected burden, which is relevant from industry point of view & why? From the given set of information, design blasting parameters (10+ 10=20 marks)

Bench height=18 fts, Explosive diameter= 2.8, Specific gravity of explosive=1.4

Specific gravity of rock=2.8, rock is weathered & having weak joint planes.

Rock deposition	Kd
Steeply dipping into cut	1.18
Steeply dipping into face	0.95
Other deposition	1.0

Rock structure	Ks
Cracks, weak joints	1.30
Thin well cemented layers, strong joints	1.10
Massive rock	0.95

8. Outline the arrangements to initiate the explosives with neat sketch. Each component of the assembly need to be explained separately in sequence (top to bottom) (20 marks)



Roll No: _____

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No. of page/s: 02

Semester – III
Max. Marks : 100
Duration : 3 Hrs

Instructions:

- a. Answers must carry the supporting material such as equations and diagrams, wherever necessary
- b. Section-A is compulsory
- c. In Section B, first 4 questions are compulsory & attempt any one from Q-6
- d. In section C, answer any 2 Questions

Section A

20Marks.

1. Each question carries 05 marks
 - i) What SMS stands for? How it is being produced? (5 marks)
 - ii) Slurry explosives stabilize the homogeneity of mixture, why? (5 marks)
 - iii) What do you mean by satellite charging? (5 marks)
 - iv) How sensitization happens in case of slurry explosive?

Section B

40 Marks

Each question carries 08 marks

2. What should be the guidelines for use of explosives in u/g mines & in watery holes
3. Why electronic detonators are the most preferred one in industry?
4. Summarize the difference between DTH & TH w.r.to their design?
5. Justify the use of NG as secondary explosive
6. Establish the relationship between decoupling & cartridge explosive

Or

Establish relationship between Burden & stemming & sub-drill, if any

Section C
Each question carries 20 Marks

40 Marks

7. Summarize the concept of true & apparent burden? Does it have any relation to blasting pattern?

8. Discuss the various controlled blasting techniques.

or

What permitted explosive stands for? Categorize them including the special types which are used in industry?

