CBCS SCHEME

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17MN46

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Drilling and Blasting Engineering

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain the following principles of rock drilling with neat and labeled sketch:
(i) Rotary drilling.
(ii) Rotary cutting.
(iii) Rotary crushing
(iv) Percussive drilling
(v) Rotary percussive drilling. **(10 Marks)**

b. Explain the mechanism of rock breakage by drilling with a neat and labeled sketch. **(10 Marks)**

OR

2 a. Explain the following types of drill bits with a neat labeled sketch:
(i) Insert bits. (ii) Button bits (iii) Retrac bits
(iv) Reaming bits. (v) Drop center bits. **(10 Marks)**

b. Summarize the factors which affects the bit life. **(05 Marks)**

c. List out the causes for deviation and misalignment in rock drilling. **(05 Marks)**

Module-2

3 a. Explain the following properties of explosives:
(i) Sensitivity
(ii) Stability
(iii) Density
(iv) Volatality
(v) Velocity of Detonation. **(05 Marks)**

b. Differentiate between low and high explosives with suitable examples. **(05 Marks)**

c. "ANFO – Ammonium nitrate and Fuel oil classified as a blasting agent and not a high explosive" Justify your answer. **(05 Marks)**

d. Differentiate between Slurry and Emulsion explosives. **(05 Marks)**

OR

4 a. What are heavy ANFO blends? What are the uses of heavy ANFO blends? **(05 Marks)**

b. Write a detailed note on following:
(i) Cylinder expansion test.
(ii) Cylinder fragmentation test.
(iii) Pressure V/s Scared distance.
(iv) Impulse V/s Scared distance.
(v) Relative bubble energy. **(10 Marks)**

c. Differentiate among plant mixed slurry and site mixed slurry. **(05 Marks)**

Module-3

5 a. With a neat sketch explain the following blasting accessories:
(i) Sufety Fuse. (ii) Detonating cord / fuse. (iii) Detonator.
(iv) Exploder. (v) NONEL. **(10 Marks)**

b. Is it possible to blast a charged hole with the combination of electric detonator and a safety fuse? Justify your answer. **(05 Marks)**

c. Write a detailed note on delay detonators with a neat labeled sketch. **(05 Marks)**

OR

6 a. With a neat labeled sketch, explain the following terminologies used while blasting:
(i) Spacing.
(ii) Burden
(iii) Stemming.
(iv) Misfire
(v) Blown out shots. **(10 Marks)**

b. Explain the various methods to treat misfire blown outs and incomplete detonation. **(10 Marks)**

Module-4

7 a. With a neat labeled sketch, explain the following :
(i) Magazines
(ii) Explosive van.
(iii) Earthing pit.
(iv) Lightning arrestor.
(v) ANFO mixing shed. **(10 Marks)**

b. List out the precautions to be taken during transportation of explosives in both opencast and underground mines. **(05 Marks)**

c. List out the precautions to be taken during transportation of bulk explosives in open cast and underground mines. **(05 Marks)**

OR

8 a. With neat labeled sketch, explain the following substitutes for explosives:
(i) Pulsed infusion shot firing.
(ii) Hydraulic coal buster.
(iii) CARDOX. **(15 Marks)**

b. List and explain the accidents which happen due to the explosives. **(05 Marks)**

Module-5

9 a. Explain the following theories in mechanics of blasting :
(i) Crater theory.
(ii) Theory of rock breakage.
(iii) Theory of shaped charges. **(10 Marks)**

b. Explain the following terminologies used in blasting :
(i) Detonation pressue.
(ii) Coupling.
(iii) Shockware impedence.
(iv) Critical diameter.
(v) Charge factor. **(10 Marks)**

OR

10 a. With a neat labeled sketch, explain the following control blasting techniques:
(i) Line drilling
(ii) Trim blasting (cushion blasting)
(iii) Smooth blasting.
(iv) Pre splitting.
(v) Muffle blasting. **(10 Marks)**

b. Explain air over pressure and fly rocks during blasting and explain how to mitigate them during blasting. **(10 Marks)**

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