

Roll No: -----

**UNIVERSITY OF PETROLEUM  
AND ENERGY STUDIES**



**End-Semester Examination – December, 2017**

**Program/course: B. Tech. in Mining Engineering**

**Semester – V Semester**

**Subject: Methods of Sub-surface Mining**

**Max. Marks : 100**

**Code : MIEG – 321**

**Duration : 3 Hrs**

**No. of page/s: 2**

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**SECTION – A**  
**(ANSWER ALL QUESTIONS)**

1. Explain or write short notes on the following:
- Factors on which layout of a Longwall face will depend.
  - Beam Theory of strata behaviour.
  - Workings in a mine where Systematic Support Rule will be applicable.
  - Disadvantages of Coal Face Mechanization.
- 5\*4=20

**SECTION – B**  
**(ANSWER 2, 3, 4 and EITHER 5 OR 6)**

- What are the parameters on which the site selection for Shaft/Incline depends?
  - What is the importance of hydraulic profile? (7+3)
- State the CMRs where two means of inlets/outlets in a mine are exempted/not applicable.
  - Discuss the different line of extractions followed in Bord & Pillar Mining. (5+5)
- Assuming your conditions and sketches, discuss the depillaring operation for a thin seam with splitting and BOS.
  - What are the differences of Mechanical and Pneumatic stowing? (7+3)
- What is Convergence? What are the factors that govern convergence of roof in L/W face?
  - Differentiate Local Fall & main Fall. (8+2)

OR

- Briefly discuss with layout, hydraulic stowing operation.

- b) What is Load bearing capacity? Name the factors on which it depends. (7+3)

**SECTION – C**  
**(ANSWER 7 and 8 OR 7 and 9)**

7. Explain with diagram, step-by-step operations of a Advancing Longwall Caving face, assuming the geo-mining parameters, coal getting machine, transport system from face and supports used at face. Also, calculate the output with this combination in a day. Justify and clearly mention the steps. (14+6)
8. a) Discuss the CMRs for Setting of Supports.  
b) Explain the strata behaviour surrounding a narrow Bord & Pillar gallery. (12+8)

OR

9. a) Explain the characteristics curve of a Powered Support with sketch.  
b) State the conditions favourable for stowing process.  
c) What are the common type of supports used in Mines? Explain. (6+6+8)



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**SECTION – A**  
**(ANSWER ALL QUESTIONS)**

1. Write short notes on the following:
  - a) Mention FIVE advantages of Shaft over Incline for accessing the deposit.
  - b) Conditions for Solid Blasting.
  - c) Disadvantages of developing an entire district by pillars and extracting the same.
  - d) Restrictions where Development in an U/G mine is not allowed. 5\*4=20

**SECTION – B**  
**(ANSWER 2, 3, 4 and EITHER 5 OR 6)**

2.
  - a) What are the differences between Advancing and Retreating Longwall methods?
  - b) Discuss the factors responsible for the selection of Coal Getting machines at face. (3+7)
3.
  - a) State the Advantages of Mechanization.
  - b) What are the CMRs for ladders placed in underground? (5+5)
4.
  - a) What are the arrangements needed for shaft sinking?
  - b) What are the factor on which Size of Panel will depend? (6+4)
5.
  - a) What is Load Bearing capacity of a support? What are the factors that govern it?
  - c) Discuss the Beam Theory of strata movement. (6+4)

OR

6. State the CMRs for Depillaring operations. (10)

**SECTION – C**  
**(ANSWER 7 and 8 OR 7 and 9)**

7. a) What are the advantages for stowing with depillaring in underground?  
b) Assume that a Bord & Pillar panel is being developed by solid blasting and manual-loading with haulage is used for transport of coal. Show and discuss the layout. Showing the steps and any other conditions needed, calculate the Powder Factor, Detonating Factor and face OMS.  
(8+12)

8. a) State the CMRs for the working shafts.  
b) Briefly explain the factors on which the selection of mining methods depends. (5+15)

OR

9. a) What is a Contiguous seam? State the CMRs for the Contiguous/Multi-section working.  
b) Discuss the difference between Hydraulic and Mechanical Stowing.  
c) Discuss the characteristics of a Power Support. (9+5+6)