B.E.(with Credits)-Regular-Semester 2012 - Mining Engineering Sem VI

MN602 - Mine Rescue Engineering

P. Pages : 2 **GUG/W/16/5399**

Time : Three Hours * 3 5 6 6 * Max. Marks :80

Notes : 1. All questions carry equal marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and Chemical equation should be given wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Calculate Graham's Ratio, Young's Ratio and Co/Co_2 ratio for the sample collected from sealed off area. **10**

$N_2 - 79.79\%, CO_2 - 8.44\%, CH_4 - 3.86\%$
$O_2 - 4.97\%$ $CO - 2.00\%$, $H_2 - 0.94\%$
What is the status of fire?

b) Explain the causes of mine fires? **6**

OR

2. a) State the measures to be taken in mines to prevent spontaneous heating. **8**

b) Describe the procedure of construction of Explosion proof stopping in Gassy mines. **8**

3. a) Explain the following terms. **8**

i) Upper limit of Inflammability.

ii) Lower limit of Inflammability.

iii) Lag on ignition.

iv) Ignition temperature.

b) Explain the mechanism of coal dust explosion with its characteristics. **8**

OR

4. a) Explain Le Chatelier Equation. By using this equation, calculate Lower limit of explosivity for the following sample. **10**

$CH_4 - 6\%, H_2 - 1.5\%, C_2H_6 - 1.5\%, CO - 1\%.$

b) Compare fire damp explosion with coal dust explosion. **6**

5. a) Explain the underground causes of Inundation in U/G mines. **8**

b) State the precautions to be observed while approaching old waterlogged workings. **8**

OR

6. a) Calculate thickness of FLAT dam from the following data to be constructed in U/G mine. **10**
Width of gallery - 4m
Height of gallery - 3m
Water head - 120m
Water inflow - 2000gpm

b) Explain with neat sketch construction and working of safety boring apparatus. **6**

7. a) Discuss the general design features of self-contained breathing Apparatus. **10**

b) Write short note on Rescue station. **6**

OR

8. a) State different methods of reopening sealed off area. Explain stage method. **8**

b) Explain the construction and working of filter self Rescuer. **8**

9. a) Discuss the effect of illumination on health, safety and productivity of miner. **8**

b) Explain the construction and working of Gravimetric Dust sampler. **8**

OR

10. Write short notes on. **16**

i) Special service lamps in mines.

ii) Glare and its control.

iii) Coal miner's pneumoconiosis.

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