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

MI - Ground Control in Mines

P. Pages : 2 **GUG/W/16/6628**

Time : Three Hours * 4 6 9 1 * 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. Illustrate your answers wherever necessary with the help of neat sketches.
5. Marks are indicated to the right.

1. Why multi criteria engineering classification schemes for rock masses are better than single criterion classification schemes? **3+**
What is the practical significance of such classification schemes? **4+**
Explain the concept and importance of i) Average Stand Up Time, ii) Excavation Support Ratio and iii) MRMR. **6+**
What are horizontal stresses in the context of mining engg and what is their significance? **3=**
16

OR

2. What is the difference in suitability conditions of Bieniawski's RMR classification scheme and Barton's Q classification scheme? **3+**
Is there any correlation between the RMR and Q-index? What modifications, and why were proposed to Bieniawsky's Classification scheme? What is the inherent limitation of any rock mass classification scheme? What was the rational of the pairing of quotients by Barton et al in the way they were done in tunneling Quality Classification Scheme? **2+**
5+
2+
4=
16

3. Attempt a classification of mine openings based on different criteria. What is the impact on existing stress pattern beneath the Earth's crust of creating excavations? How does the induced stress concentration get affected by increase in the number of i) single openings and ii) multiple openings? What are the different types of stresses that get induced around single circular opening? **3+**
3+
4+
6=
16

OR

4. Enlist and briefly describe the various types of pillars made in underground mine workings. **4+**
Discuss the various important factors affecting the i) average pillar pressure and ii) pillar strength. **8+**
How do numerical stress analysis methods compare with classical closed – form solution methods? **4=**
16

5. What is a rock burst? How does it differ from a coal bump and a gas outburst? **3+**
"Rock burst is a seismic event". Do you agree with the statement? Why? **3+**
What are the minimum conditions that must be present for rock burst and bump to take place? **6+**
4=
16

OR

6.	Write short notes on:	**4+**
		4+
	i) Overburden Movement and Abutment Pressure in Longwall Mining,	**8=**
		16
	ii) Immediate Roof, Main Roof and controlling their movement, and	
	iii) Multi-channel Data Acquisition Systems used for monitoring rockbursts.	
7.	What do you understand by i) subsidence, ii) sub-surface subsidence and iii) surface subsidence? Briefly describe, with the aid of illustrative diagrams, different types of surface subsidence.	**3+** **3+** **5+**
	What surface measures would you suggest to protect surface structures from the adverse impacts of subsidence due to mining activities.	**5=** **16**
	What is harmonic extraction of mineral deposits?	
	OR	
8.	Discuss how subsidence due to underground mining activities could be predicted?	**16**
9.	Explain the working principle, construction and use of i) Load Cells and ii) Bore Hole Extensometers.	**6+** **10** **=1**
	OR	**6**
10.	What are the factors that affect the slope stability of opencast benches? Discuss some important techniques of slope stability analysis.	**8+** **8=** **16**