

B.E. End Semester Examinations, 2013

(6th Semester Mining Engineering)

Session: 2012-2013

Subject: Environmental Science and Engineering

Subject Code: MN 603

Full Marks: 70

Time: 3 hours

1st Half

Question No. 1 and any two from the rests

1. a) Briefly discuss the potential threat of acid mine drainage (AMD).
b) Write down the mechanism of AMD treatment by anoxic limestone channels. (5+10=15)
2. Briefly describe the environmental impact on land, water, air and vegetation due to mining. (10)
3. a) How do you categorize mine wastes?
b) Briefly enumerate the factors influencing the rate of pyrite oxidation. (4+6=10)
4. a) Write down the basic steps for developing a scientific reclamation plan.
b) Describe briefly, the reclamation procedure of a mine site. (4+6=10)
5. a) Enumerate the characteristics of mine tailings.
b) What are the environmental concerns for tailings dam? (4+6=10)

SECOND HALF

Attempt question no 6 and any two questions from the rest. All parts of a question are to be answered together.

6. Define the term '*sustainable development*' and discuss in brief the '*principles of sustainable development*'. Explain the concept of '*environmental sustainability*' and enumerate the input output rules for using non-renewable natural resources so as to ensure environmental sustainability. $[(2+4)+(2+5)=13]$
7. a) What is '*Environmental Impact Assessment*' (EIA)? Discuss in outline form the procedure for conducting an EIA.
- b) A new iron ore mine with a mining lease area of 52 ha is proposed. In the light of the EIA Notification 2006 (as amended till date) state whether a comprehensive EIA will be required for the Project? Justify your answer. To whom the project proponent should apply for environmental clearance? What procedure will be followed by the 'environmental appraisal committee' concerned for evaluating the application and granting/ rejecting environmental clearance? $[(2+4)+(1+1+3)=11]$
8. Name three important Acts related to environmental pollution control in India and state the principal objectives associated with each of them. How the definition of pollution varies in the 'Water Act', the 'Air Act' and the 'EP Act' (names of the Acts are in common parlance). In India 'National Ambient Air Quality Standards' (NAAQS) are issued by the 'Central pollution control Board' (CPCB). State the legal provisions under which NAAQS can be issued by the CPCB. $[3+5+3=11]$
9. a) Show that when two similar sources add up, the combined SPL goes up by 3 dB
- b) What is the difference between dB and dBA?
- c) A worker is exposed to: 90 dBA for 3 hours, 87 dBA for 2 hours, 92 dBA for 2 hours and 85 dBA for 1 hour in a shift. Calculate the equivalent noise level the worker is exposed to. $[2+3+5=11]$
 $[3+2+6]$
10. (a) With the help of an explanatory sketch describe a hypothetical self-sustaining balanced aquatic eco system
- (b) 100 g of glucose is dissolved in one litre of water. Calculate the theoretical BOD of the solution.
- (c) Is it true that in our laboratories we do not measure ultimate BOD but the BOD exerted over a given period of time at a certain temperature? Explain your answer. $[6+3+2=11]$
11. With the help of an explanatory sketch explain the Gaussian Plume Equation for estimating air pollutant concentration at a point downstream from a source of emission. What simplifying assumptions are made in Gaussian Plume Equation? $[8+3=11]$