UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May, 2018

Program Name: B.Tech. in Mining Engineering **Semester – IV**

Course Name : Mine Ventilation **Max. Marks : 100**
Course Code : MIEG 225 **Duration : 3 Hrs**
No. of page/s: 2

SECTION A
(ANSWER ALL QUESTIONS)

1. Write short notes or explain briefly the followings:
   a) Different parameters to be measured in Ventilation Survey.
   b) Sources of Moisture in Mines.
   c) Sources of Leakage in a underground Mine.
   d) Differences between Central and Boundary Ventilation System. (5*4=20)

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

2. a) State the CMRs for Splits, Brattice, Stoppings and Air-crossing in ventilation.
   b) How to increase the quantity of air flowing through mines? (6+4)

3. Briefly explain the essential features of a good ventilation system. (10)

4. a) Discuss briefly the various Characteristics graphs for different mine fans.
   b) What are the parameters by which a fan is selected? (6+4)

5. a) Show the flow of mine air in a underground coal mining district. State your assumptions and put the reasons behind your arrangements/justify your layout. (10)

OR

6. a) State the CMRs for the Auxiliary fans in mines.
   b) Show how to determine NVP from fan running/stopped condition. (5+5)

SECTION C

(ANSWER 7 and 8 OR 7 and 9)

7. a) A mine is ventilated by a fan running at 300 RPM and generating a quantity of 6000 m^3/min at 75 mm w.g. The fan absorbs 160 BHP. To increase the quantity of air, the fan is speeded up to 400 RPM. Calculate the new quantity, pressure generated and BHP. Also, calculate the efficiency of the fan.
   b) Discuss the characteristics of two fans put in series. Where this can be used?
   c) What is the advantages of surface installation of Fans? (10+6+4)

8. a) Discuss the CMRs for Main Mechanical Ventilator.
   b) A mine fan produces a pressure of 500 Pa and passes 25 m^3/s of air though the trunk roadway that has two splits at its end. Split A and split B are having 15 m^3/s and 10 m^3/s of air, respectively. It is decided to put a Booster fan at split B to increase the quantity upto 15 m^3/s. calculate the size/pressure of the Booster fan if the resistance of shaft and trunk roadway is 0.2 Ns^2m^{-8}.
   c) What are the differences between Axial Flow fans and Centrifugal fans? (6+10+4)

OR

9. a) Show the different steps involved in Ventilation Planning.
   b) With examples, show the concepts for Booster fan installation. (12+8)