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Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Mine Ventilation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the Production , Properties , Physiological effects and detection of Carbon monoxide. (10 Marks)
- b. Explain any two method of Methane drainage. (10 Marks)

OR

- 2 a. Explain the Production , Properties , Effects and detection of Marsh gas. (10 Marks)
- b. Explain the Production , Properties , Physiological effects and detection of Radon gas. (10 Marks)

Module-2

- 3 a. Describe the important sources of heat in Mines. (10 Marks)
- b. Describe the method of measuring Relative Humidity. (10 Marks)

OR

- 4 a. Describe the efforts of Heat and Humidity on Workers. (10 Marks)
- b. Describe the method of measuring Cooling Power of Mine Air. (10 Marks)

Module-3

- 5 a. Illustrate the Air crossing, with a neat sketch. (10 Marks)
- b. A total quantity of $100\text{m}^3/\text{min}$ of air is passing through the splits. One airway is $2.5\text{m} \times 1.5\text{m}$ and 100m long and the other with similar lining is $2\text{m} \times 1.5\text{m}$ and 125m long. Calculate the quantity of air passing in each split. (10 Marks)

OR

- 6 a. Illustrate the regulator, with a neat sketch. (10 Marks)
- b. Three splits is parallel of similar cross – section and same type of roadway surface are respectively 300m , 600m and 900m long. Calculate the quantity of air which would flow in each if the quantity is $200\text{m}^3/\text{min}$. (10 Marks)

Module-4

- 7 a. Explain the causes of Natural ventilation pressure. (08 Marks)
- b. Air temperature in DC shafts 465m deep is 30°C and 37°C respectively. Calculate the height of motive column. Find out the density of DC air and the amount of NVP. (12 Marks)

OR

- 8 a. Determine the important points to be considered in selection of Fans. (10 Marks)
- b. A mine fan generates a pressure of 50mm w-g which is sufficient to circulate 2.5m^3 of air/second through the mine which consists of two splits A and B. A circulating $15\text{m}^3/\text{sec}$ and B is $10\text{m}^3/\text{sec}$. It is desired to increase the quantity in split B to $15\text{m}^3/\text{sec}$ by installing a booster fan in it. Calculate size of the booster, if resistance of the shaft and trunk airways in 0.02 Wb . (10 Marks)

Module-5

- 9 a. Explain the ventilation parameters to be considered in Ventilation Planning. (08 Marks)
b. Illustrate U – tube system of Mine Ventilation with a neat sketch. (12 Marks)

OR

- 10 a. Explain the Ventilation system for bord and Pillar Mining. (10 Marks)
b. Explain the Ventilation system for Longwall Mining. (10 Marks)
