22232

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

(a) Name the instrument and formula for measuring cooling power of air.

(b) Enlist and define different damps found in mine air.

(c) Define pressure surveying.

(d) Define Total pressure with respect to fan.

(e) State any four safety devices used in flame safety lamp.

(f) Define relative humidity.

(g) Define Geothermic gradient.

2. Attempt any TWO of the following : **12**

(a) How will you calculate relative humidity using whirling hygrometer ?

(b) Mean air temperature in a DC shaft 400 m deep is 30 ºC and in the UC shaft is 38 ºC. Calculate the motive column and the N.V.P. assuming average barometric pressure in DC shaft to be 750 mm of Hg.

(c) Compare Auxillary fan with Booster fan.

3. Attempt any TWO of the following : **12**

(a) Calculate the water gauge (w.g.) produced by a 4 m dia. fan running at 260 rpm and delivering 6000 m^3/min of air if the blades are (i) radial (ii) bent backward at 40º (iii) bent forward at 35º.

Assume velocity of flow – ρ m/sec and Air density = 1.2 kg/m^3.

(b) Explain the factors causing Natural Ventilation Pressure.

(c) Compare Forcing fan with Exhaust fan.

4. Attempt any TWO of the following : **12**

(a) Explain the advantages of Splitting.

(b) State Atkinson's equation and the laws of mine air friction.

(c) Compare Axial flow fan with centrifugal fan.

5. Attempt any TWO of the following : **12**

(a) A mine is ventilated by a fan producing 6000 m^3 per min at 75 mm w.g. The fan runs at 300 rpm and absorbs 160 B.H.P. To increase the volume of air flowing through the mine, the fan is speeded upto 450 rpm. Calculate (i) Volume of air at new fan speed & (ii) New w.g. B.H.P. and Efficiency of the fan.

(b) Compare Ascential ventilation with Descential ventilation.

(c) State the importance of ventilation survey. Describe survey interval and location of survey stations.

6. Attempt any THREE of the following : **12**

(a) Draw neat sketch of ventilation stopping and ventilation door and explain its working.

(b) How will you use Velometer to calculate air velocity ?

(c) State the standards of ventilation.

(d) How will you carry out accumulation test with the help of flame safety lamp ?

(e) Draw any four sketches of conventions, signs and symbols in ventilation plan with colour code.
