Time : 3 hours	*Total Marks* : 80

PART—A   **3×10=30**

Instructions: **(1) Answer all questions.**

(2) Each question carries three marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write any three advantages of S.I units. (CO1)

2. Define moment of force. Write its SI unit. (CO1)

3. Find the work done in lifting a body of mass 10 kg through a height of 20 m against gravity. (CO2)

4. Define absolute zero temperature. Convert -10 °C into Kelvin temperature. (CO3)

5. Define Doppler effect. Mention one application. (CO3)

6. Write the Sabine's formula for reverberation time and name the parameters in it.   (CO3)

7. Define specific resistance. Write its S.I unit. (CO4)

8. Write any three characteristics of magnetic lines of force. (CO4)

9. Draw a neat diagram of photoelectric cell and name the parts. (CO4)

10. Write any three applications of optical fibers. (CO4)

PART—B   10×5=50

Instructions : **(1) Answer *any* five questions.**
(2) Each question carries ten marks.
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) State and explain triangle law of vectors.   6
    (b) A force of 100 N acts on a particle at an angle of 30° to the horizontal. Find the horizontal and vertical components of force.   4

(CO1)

12. State and explain Kepler's law of planetary motion.   10

(CO2)

13. (a) Derive the r e l a t i o n s h i p b e t w e e n g a n d G.
    (b) Calculate the orbital velocity of a satellite so that it revolves around the earth if the Radius of earth = 6.5×10^6 m, mass of earth = 6×10^{24} kg and Gravitational constant G = 6.67×10^{-11} Nm^2/kg^2.   5+5

(CO2)

14. Explain the principle of solar thermal conversion and photo voltaic effect. 5+5

(CO2)

15.   (a) Derive the ideal gas equation.
        (b) Volume of a gas at 27 °C is 100 CC. Keeping the pressure constant, find its volume at a temperature of 50 °C.   7+3

(CO3)

16.   (a) Write any five methods of reducing noise pollution.

        (b) Define echo. Write three applications of it.   5+2+3   (CO3)

17.   (a) Derive   an   expression   for   balancing   condition   of Wheatstone's bridge with neat circuit diagram.
        (b) The values of resistance of P, Q, R are 50 Ω, 10 Ω and 15 Ω respectively in the balanced condition of the bridge. Find the unknown resistance S.   7+3
                                                                    (CO4)

18. Explain n-type and P-type semiconductors. 5+5   (CO4)