REVISION WORKSHEET: GRADE XI SIS. BW.

1. A pipe 30 cm long is open at both ends. Which harmonic mode of the pipe resonates at 1.1KHz source. $v = 330$ m/s.
2. A grindstone has M.I $= 6$ kg m^2 about its axis. A constant torque is applied and the grind stone is found to acquire a speed of 150 rotations/min in 10s after starting from rest. Calculate the torque.
3. Two rods A and B of unequal lengths ($l_A = 2l_B$) Their thermal conductivities are K_1 and K_2 and radii r_1 and r_2 respectively Find $\frac{K_1}{K_2}$ if both conduct same amount of heat, when their ends are kept at the same temp. T_1 and T_2.
4. Two gases He and hydrogen are in thermal equilibrium. What is the ratio of K.E of He and H_2 molecules.
5. If the earth shrinks to half of its radius what will be the duration of the day? present duration is 24hrs.
6. A body weighs 90 kgwt. on the surface of the earth. How much will it weigh on the surface of a planet whose mass is $\frac{1}{9}$ and radius $\frac{1}{2}$ of the earth.
7. The F-t graph of a body of mass $m = 2$ kg is given. Find velocity at the end of 4s if the body starts from rest.
8. A block slides on a smooth inclined plane & when released from the top while another falls freely from the same point. Which one of them will strike the ground earlier?
9. A simple pendulum of length l is suspended from a ceiling of a lift which is moving with an upward acceleration a. What is the time period

10. Explain why it is easier to pull a lawn mower than to push it.
11. Show that angular momentum of a satellite of mass M_s revolving round the earth having mass M_e in an orbit of radius r is equal to $\sqrt{GM_eM_s^2r}$.
12. How does an adiabatic process differ from an isothermal process? What happens to the internal energy of a gas during
    (i) Isothermal process.
    (ii) adiabatic expansion.
13. Which of the two will increase the pressure more, an adiabatic or an isothermal process in reducing the volume to 50%.
14. Determine the maximum acceleration of the train in which a box lying on its floor will remain stationary, given that the coefficient of static friction between the box and the trains floor is 0.15.
15. The whistle of an engine moving at 30 km/hr is heard by a motorist driving at 15 km/hr and he estimated the pitch to be 500 Hz. What would be the actual pitch if the two are approaching each other. $v = 1220$ km/hr.
16. At what height above the earth's surface, value of 'g' is same as in a mine 10,000 km deep.
17. The fundamental frequency of a closed pipe is equal to the first overtone frequency of an open organ pipe. If the length of the open pipe is 60 cm, what is the length of the closed pipe?
18. A cyclist moving on a circular track of radius 100 m completes one revolution in 4 s. What is his a. average speed b. Average velocity in one full revolution.