BR- 1027 (ಸಾ.ಶ.ಪ.-2018)

FIRST PUC ANNUAL EXAMINATION – 2018

Time: 3-15 hours | **PHYSICS -(33)** | Max Marks: 70

No.of Pages: 02 | Total No.of Ques.: 37

General Instructions :

1] All parts are compulsory.

2] Answers without relevant diagram /figure/ circuit wherever necessary will not carry any marks.

3]Direct answer to numerical problems without detailed solutions will not carry any marks.

PART-A

I Answer ALL the following questions : 10x1=10

1) Write the dimensional formula of pressure .
2) What is a unit vector?
3) What is the nature of the work done by frictional force ?
4) Where does the centre of maas of uniform Triangular laminalie?
5) What are elastomers?
6) Which law is connected to the working of the Hydraulic brake?
7) Define Viscosity .
8) What is regelation ?
9) Mention the significance of Zeroth law of Thermodynamics .
10) How does the average kinetic energy of a gas molecule depend on the absolute temperature of the gas?

PART-B

II Answer any FIVE of the following questions : 5x2=10

11) Name any two fundamental forces in nature.
12) Write any two applications of dimensional analysis.
13) Distinguish between distance (path length) and displacement.
14) What is a projectile ? Give example .
15) What is banking of roads? Why banking is necessary for a curved road?
16) When is Torque maximum and minimum?
17) What is a Venturimeter? On what principle does the Venturimeter work ?
18) Mention any two characteristics of SHM(Simple Hormonic Motion)

PART-C

III Answer any FIVE of the following questions : 5x3=15

19) Obtain an expression for Time of flight of a projectile .
20) Using Newton's second law of motion arrive F = ma .
21) Prove work energy theorem for a constant force .
22) Obtain the relation between Torque and angular momentum,.
23) State Kepler's law of planetary motion.
24) Mention three types of moduli of Elasticity.
25) Obtain an expression for pressure at a point inside a liquid
26) Write any three assumptions of Kinetic theory of gases .

P.T.O.

PART-D

IV Answer any TWO of the following questions : **2x5=10**

27) What is v-t graph? Derive $x = v_0 t + \frac{1}{2} at^2$ using v-t graph.

28) Derive an expression for maximum speed of a car on a banked road incircular motion.

29) State and explain parallel axes theorem and perpendicular axes theorm

V Answer any TWO of the following questions : **2x5=10**

30) Derive an expression for work done by the gas in an Isothermal process.

31) Derive an expression for Time period of Oscillation of a simple pendulum.

32) What is closed pipe ? Discuss the modes of vibrations of air column in a closed pipe.

VI Answer any THREE of the following questions : **3x5=15**

33) A Football player kicks a ball at an angle of 30^0 to the horizontal with an initial velocity of 15 ms^{-1}. Assuming the ball travels in a vertical plane, Calculate the a] Maximum height b] Time of flight and c] Horizontal range [$g = 9.8ms^{-2}$]

34) A pump on the ground floor of a building pumps water to fill a tank of volume $30m^3$ in 15 minutes. If the tank is 40m above the ground and efficiency of the pump is 30%. How much electrical power is consumed by the pump? [Density of water 10^3 kgm^{-3}] ($g = 9.8$ ms^{-2}]

35) Calculate the acceleration due to gravity at a point a] 64km above and b] 32km below the surface of earth.
Given Radius of Earth= 6400km.Acceleration due to gravity at the surface of earth = $9.8ms^{-2}$.

36) A metal cylinder 0.628m long and 0.04m in diameter has one end in boiling water at 100^0C and other end is melting ice. The co-efficient of Thermal conductivity of the metal is 378 $Wm^{-1}k^{-1}$. Latest heat of Ice is $3.36 \times 10^5 Jkg^{-1}$. Find the mass of ice metls in one hour .

37) A train moving at a speed of 72kmph towards a station is sounding a whistle of frequency 600Hz. What are the apparent frequencies of the whistle as heard by a man on the platform when the train (i) approaches him (ii) recedes from him ?
[Given speed of sound in air = $340ms^{-1}$]