Karnataka Board

1st PUC

Question Paper

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Code No.20CC20

DISTRICT LEVEL I PUC ANNUAL EXAMINATION, FEB-2020

Time: 3 Hrs. 15 Mins. **Sub: PHYSICS (33)** **Max. Marks: 70**

General Instructions:

1. All parts are compulsory.
2. Draw relevant diagram / figure wherever necessary.
3. Numerical problems should be solved with relevant formulae.

Part – A

I. **Answer ALL the following questions:** **10 × 1 = 10**

1. What is basis?
2. What is unit vector?
3. When does the work done by a force negative?
4. Define radius of gyration.
5. Name the natural satellite of the earth.
6. Define stress.
7. What is streamline flow?
8. Give the principle of calorimetry.
9. How does the average kinetic energy of a gas molecule vary with absolute temperature?
10. Give the physical significance of zeroth law of thermodynamics.

Part – B

II. **Answer any FIVE of the following questions:** **5 × 2 = 10**

11. Mention any two fundamental forces in nature.
12. Write the two applications of dimensional analysis.
13. Distinguish between path length and displacement.
14. Write the expression for range of the projectile. State the condition for maximum range of a projectile.
15. Define terms: (a) Impulsive force and (2) Impulse of a force.
16. State and explain Newton's law of gravitation.
17. Where is the potential energy of a body maximum and minimum?
18. What is Doppler effect? Mention any one application of Doppler effect.

Part – C

III. **Answer any FIVE of the following questions:** **5 × 3 = 15**

19. Derive an expression for centripetal acceleration.
20. Mention any three methods of reducing friction.
21. Obtain an expression potential energy of a spring.
22. Mention three types of moduli of elasticity.
23. State Pascal's law. Mention two applications of Pascal's law.
24. State that $\alpha_v = \frac{1}{T}$ for an ideal gas.

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25. Write the three assumptions of kinetic theory of gases.

26. Give the Newton's formula for the speed of sound in a gas. Explain Laplace's correction to Newton's formula.

Part – D

IV. **Answer any TWO of the following questions:** 2 × 5 =10

27. Obtain the equation for trajectory of a projectile.

28. State and prove work – energy theorem for a constant force.

29. Define torque. Derive the relation between torque and angular momentum.

V **Answer any TWO of the following questions:** 2 × 5 = 10

30. Obtain an expression for acceleration due to gravity at a height 'h' from the surface of the earth.

31. What is heat engine? Explain its working principle. Define efficiency of heat engine.

32. Derive an expression for time period of oscillations of a simple pendulum.

VI **Answer any THREE of the following questions:** 3 × 5 = 15

33. A car moving along a straight highway with a speed of 126 kmph is brought to rest within a distance of 200m. Calculate the retardation of the car. (assumed to be uniform). How long does it take for the car to stop?

34. a cricket ball moving horizontally with a velocity of $12 ms^{-1}$ is brought to rest by a player in 0.1s. If the cricket ball weighs 0.15kg, calculate impulse of a force and the average force applied

35. A rope of negligible mass is wound round a hollow cylinder of mass 3kg and radius 0.4m. What is the angular acceleration of the cylinder if the rope is pulled with a force of 30N? What is the linear acceleration of the rope? Assume that there is no slipping

36. A metal cylinder 0.628m long and 0.04m id diameter has one end in boiling water at 100°C and the other end in melting ice. The coefficient of thermal conductivity of the metal is $378 Wm^{-1} K^{-1}$. Latent heat of ice is $3.36 \times 10^5 JKg^{-1}$. Find the mass of the ice that melts in one hour

37. A stone dropped from the top of a tower of height 300m splashes into water of a pond near the base of the tower. When is the splash heard at the top? Given that the speed of sound in air is $340 ms^{-1} [g = 9.8 ms^{-2}]$

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