

RRV GIRLS HIGHER SECONDARY SCHOOL, KILIMANOOR
FIRST YEAR HIGHER SECONDARY PRE MODEL EXAM- 2023

PHYSICS

Maximum: 60 Scores

Time: 2 Hours

Cool – off time: 15 Minutes

Answer any five questions from 1 to 6. Each carry one score (1×5=5)

1. The number of significant figures in 1.0084 is _____.
2. Write the relation between torque and angular momentum?
3. Sound produced to buy an open pipe contains (fundamental components only, odd harmonics only, all the harmonics, even harmonic only).
4. The value of acceleration due to the gravity at the centre of the Earth is _____?
5. Temperature of human body is 98.4 degree F find the corresponding temperature on Celsius scale.
6. What is a second's pendulum?

Answer any five question from the 7 to 12 each carry 2 score (2×5=10)

7. State and prove work energy theorem for a constant force?
8. How is the average KE of a gas molecule related to temperature of the gas?
9. A car moving along a straight Highway with speed of 126 km per hour is stop within a distance of 200 m what is the retardation of the car?
10. (a) What is an isothermal process?
(b) Write down the equation of isothermal process?
11. State the law of equipartition of energy?
12. The escape velocity from earth for a piece of 100 gram is 11.2 km / second. What would it be for a piece of 10 gram ? Give reason for your answer.

Answer any 6 questions from the 13 to 20 each carry 3 score (3×6=18)

13. (a) Cross product of two similar vector is _____?

(b) Two factors 5N and 20N are acting at then angle 120 degree between them. Find the magnitude of resultant force.

14.(a) State Pascal's law.

(b) Explain the working of hydroulic lift.

15. Explain why

(a) A cricketer moves his hands backwards when holding a catch.

(b)The passengers are thrown forward from their seats when a speeding bus stop suddenly.

16. (a) Define stress and strain.

(b) Which is more elastic -Steel or rubber? Why?

17.A Carnot engine operating between a source at temperature T_1 K and a sink at a temperature T_2 K

(a) Draw the carnot cycle

(b) what are thermodynamic process involved in the carnot cycle.

18. (a) What is SHM?

(b) Show that the acceleration of a particle in SHM is proportional to the displacement.

19. (a) What are stationery waves?

(b) draw the fundamental mode of vibration of stationary wave in (i) closed pipe and (ii)an open pipe

20. (a) What is thermal expansion?

(b) Write the relationship between three types of coefficients of thermal expansion.

(C) aquatic animals are protected in a cold countries as ice is formed on the surface of river. How?

Answer any three questions for 21 to 24. Each carry 4 score (4×3=12)

21. (a) Name the principal which is used to check the dimensional correctness of an equation.

(b) Check Correctness of the following Equation

$$E = mc^2 \text{ Where the symbols have their usual meanings.}$$

(c) Find the Dimensions of a/b in the relation

$$V = a + bt$$

Where 'v' is the velocity and 't' is the time

22. (a) State the law of conservation of mechanical energy

(b) Prove it in the case of freely falling body

23. (a) Draw the Velocity – Time graph of a uniformly accelerated body having non zero initial velocity

(b) Using the graph derive the following equation of motion

$$(i) v = u + at \quad (ii) S = ut + \frac{1}{2} at^2$$

24 (a) Define moment of inertia of a body

(b) Obtain an expression for KE of a rotating body

Answer any 3 question from 25-28 each carry 5 scores

(5×3=15)

25. (a) What is a projectile?

(b) Derive an expression for

(a) Time of flight

(b) Maximum height of projectile projected with speed u making an angle θ with horizontal direction

26. (a) What do you understand by acceleration due to gravity.

(b) Write the relationship between g and G.

(c) Explain the variation of acceleration due to gravity with height.

27. (a) Write down equation of continuity.
(b) State and prove Bernoulli's principle.
28. (a) State the law of conservation of linear momentum.
(b) Prove the law based on Newton's third law of motion.
(c) What is recoil of gun.

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