

GREEN LAWNS HIGH SCHOOL

TERMINAL EXAMINATION 2019

SUBJECT: PHYSICS

CLASS: IX

TIME: 2 HOURS

MARKS: 80

**Note:**

- You will not be allowed to write during the first 10 minutes. Use this time to read the paper carefully.
- The time given at the head of this paper is the time allowed for writing the answers.
- The intended marks for a question are given in the brackets. Write concise, to the point answers using scientific terms.
- Section I : Compulsory
- Section II : Attempt any 4 questions.

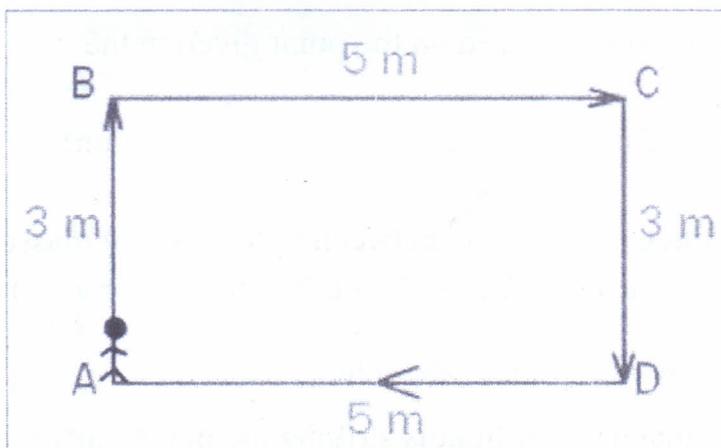
**Section I – 40 marks (Attempt all questions)**

**Q.1** (10)

- 1) Write the two ways to decrease the least count of a screw gauge? (2)
- 2) If a ball and a handkerchief are dropped simultaneously in vacuum from the top of a tower, which of the two will reach the ground first? Give reason. (2)
- 3) State Newton's second law of motion. What is the relationship between the S.I. and C.G.S. unit of force? (2)
- 4) i) Name the spherical mirror which has virtual focus. (2)  
ii) Write one use of the above mirror.
- 5) State two factors affecting pressure exerted by a body on a surface. (2)

**Q.2** (10)

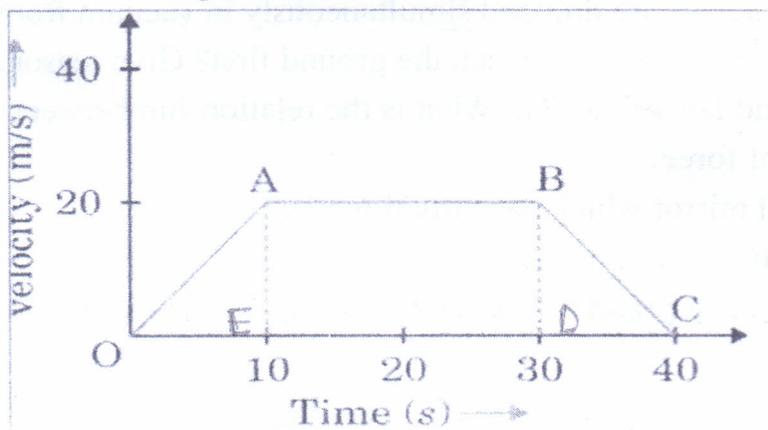
- 1) Calculate the distance and displacement from the following figure. (Position of arrows indicates the direction of motion of that person.) (2)



- 2) If a perfectly working pendulum clock is taken to the moon, will it run slower or faster than it runs on the earth? Give reason for your answer. (2)
- 3) The blades of a ceiling fan continue to rotate for some time even after the current is switched off. Give reason. (2)
- 4) i) Define : Linear magnification. (2)  
 ii) What is its sign for virtual image?
- 5) i) Define : One pascal. (2)  
 ii) What are the other units used to measure atmospheric pressure, other than pascal?

**Q.3 (10)**

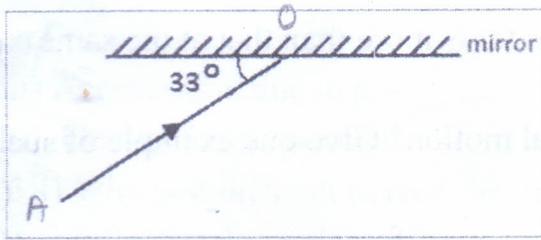
- 1) A small metal ball is suspended by a string attached to a clamp stand. Draw a neat labelled diagram showing the forces acting on the ball and the string. (2)
- 2) The velocity-time graph of moving body is given, using this graph calculate the displacement of body in Part AB. (2)



- 3) How many plane mirrors are used in kaleidoscope? How much is the angle between these mirrors? (2)
- 4) i) Differentiate between the following based on the point given in the brackets: (2)  
 Pressure exerted by solids and pressure exerted by fluids. (Direction)  
 ii)  $1 \text{ kgf} = \underline{\hspace{2cm}} \text{ N}$
- 5) Calculate the gravitational force of attraction between two bodies of masses 20 kg and 40 kg separated by a distance 20 m. ( $G = 6.7 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$ ) (2)

**Q.4 (10)**

- 1) The following figure shows that a ray of light is striking the plane mirror and making an angle of  $33^\circ$  with plane mirror. Find the angle of incidence and complete the ray diagram by showing the position of reflected ray. (2)



- 2) The area of cross section of press plunger of a hydraulic press is  $5 \text{ m}^2$ . It is required to overcome a resistive load of 250 kgf on it. Calculate the force required on the pump plunger if the area of cross section of the pump plunger is  $0.5 \text{ m}^2$ . (2)
- 3) When breaks are applied to the car, the retardation produced is  $30 \text{ ms}^{-2}$  (2) and car takes 3.5 s to stop. Calculate the initial velocity of the car.
- 4) Fill in the blanks. (4)
- 2880 min = \_\_\_\_\_ day.
  - 3 a.m.u. = \_\_\_\_\_ kg.
  - 1 light year = \_\_\_\_\_ km.
  - 4.5 metric tonne = \_\_\_\_\_ quintal.

### Section II – 40 marks

Attempt any 4 questions from this section.

#### Q.5 (10)

- State Pascal's law of transmission of pressure. Draw a diagram of principle of a hydraulic machine. (3)
- Identify the Newton's Law of motion applicable in following examples. (3)
  - Motion of a boat in water.
  - When a running car stops suddenly, the passenger tends to lean forward.
  - Athletes often lands on sand after taking a high jump.
- A body with initial velocity of  $18 \text{ km h}^{-1}$  accelerates uniformly at the rate of  $75 \text{ cms}^{-2}$  over a distance of 50 m. Calculate: (4)
  - the acceleration in  $\text{ms}^{-2}$ .
  - its final velocity in  $\text{ms}^{-1}$ .

#### Q.6 (10)

- Draw a ray diagram to show the formation of image by a concave mirror (3) when an object is at infinity. State the position and characteristics of the image.
- Give reason for the following: (3)
  - The ends of nails are made pointed.
  - The wall of a dam is *made thicker at the bottom*.

iii) The pressure at a certain depth in sea water is more than that at the same height in river water.

3) What is the meaning of one dimensional motion? Give one example of such motion. (2)

4) How does the liquid pressure on diver changes if: (2)

i) The diver moves to greater depth?

ii) The diver moves horizontally?

**Q.7** (10)

1) Show that the rate of change of momentum is equal to the product of mass and acceleration. (3)

2) Name the instruments used for measuring length having the following least count: (3)

i) 0.1 mm ii) 1mm iii) 0.01 mm

3) A rectangular plate of  $20\text{ m} \times 5\text{ m}$  is placed horizontally 2 m below the surface of water. The atmospheric pressure is  $1.013 \times 10^5\text{ Nm}^{-2}$ . Calculate the total thrust on the plate. (Density of water  $\rho = 10^3\text{ kg m}^{-3}$ ,  $g = 9.8\text{ ms}^{-2}$ ) (4)

**Q.8** (10)

1) i) The velocity of a body is continuously changing. Can its speed remain constant? Give reason for your answer. (3)

ii) If speed is changing, can the velocity of body remain constant?

iii) Is it possible for a body to have a constant speed in accelerated motion?

Justify your answer.

2) i) Define: Unit. (3)

ii) Differentiate between the following based on the point given in the brackets:

Fundamental units and Derived units. (Definition)

iii) Give one example of fundamental unit and derived unit.

3) An object of size 1.2 cm is placed at a distance of 12 cm from a convex mirror of radius of curvature 12 cm. Find the position of the image and size of the image. (4)

**Q.9** (10)

1) Name the part of the vernier callipers which is used to measure following: (3)

i) Thickness of pen.

ii) Internal diameter of a ring.

iii) Depth of a small beaker.

2) What do you understand by the following terms: (3)

- i) Force due to gravity
  - ii) Acceleration due to gravity.
  - iii) Gravitational constant.
- 3) i) Why is it difficult to read the image of the text of a page formed due to reflection by a plane mirror? (2)
- ii) How is the position of image related to the position of the object?
- 4) A simple pendulum is made by suspending a bob of mass 50 g by a string of length 40 m. Calculate its time period at a place. ( $g = 10 \text{ ms}^{-2}$ ) (2)

**Q.10** (10)

- 1) An object is kept 70cm in front of the plane mirror. If mirror is now moved 0.30 m away from an object, how does the image of an object shift from its previous image? (3)
- 2) State whether true or false, if false correct the statement. (3)
- i) Action and reaction acts on the same body in opposite direction.
  - ii) Lighter object has less inertia than the heavier object.
  - iii) The acceleration produced in a body of given mass is directly proportional to the force applied on it.
- 3) Following table gives the displacement of a car at different instants of time.

Time (S)	0	2	4	6	8	10
Displacement (m)	0	3	6	9	12	15

Plot displacement-time graph and calculate the average velocity of a car. (4)