V I B G Y O R   H I G H

Second Term Examination
2019-2020
PHYSICS

Grade : VIII   **Max. Marks   : 80**

Date   : 16/03/2020   **Time Allowed: 2 hours**

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INSTRUCTIONS:

- **Answers to this paper must be written on the paper provided separately.**
- **You will not be allowed to write during the first 15 minutes.**
- **This time is to be spent in reading the question paper.**
- **The time given at the head of this paper is the time allowed for writing the answers.**
- **The intended marks for the questions or parts of questions are given alongside the question.**
- **The question paper contains _8_ pages.**

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Section I (40 Marks)

(Attempt **all** questions from this section)

Question 1

a   **Choose the correct answer.**   **[2]**

  I.   A man can hear the sound of frequency

     (i)   1 Hz

     (ii)   1000 Hz

     (iii) 200 kHz

     (iv) 5 MHz

  II.   The speed of sound in air at $0°C$ is nearly

     (i) $1450 \ ms^{-1}$

(ii)   450 ms^{-1}

(iii) 5100 ms^{-1}

(iv)   330 ms^{-1}

b   State Newton's 2nd law of motion and write its mathematical   **[2]**
        expression.

c   (i)   Name the type of motion of the following: **[2]**

            1. A body moving with a constant speed in a straight line
            2. Circular motion
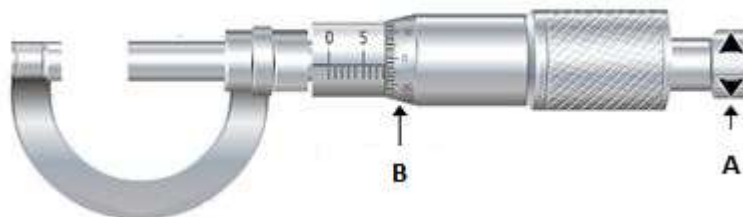
    (ii) Name the graph, the slope of which represents acceleration.

d   Define the following: **[2]**

    (i)   Potential difference.

    (ii) Current.

e   Study the given figure and answer the following questions.

        [2]

    (i)   Identify A and B.

    (ii) Explain the function of A.

        Question 2   **[2]**

a   (i)   Define acceleration.

    (ii) Define speed.

b   Name two factors on which the time period of a simple   **[2]**

pendulum does not depend.

| c | Differentiate between mass and weight. | **[2]** |

| d | What do you mean by the term frequency of a wave? State it's S.I. unit. | **[2]** |

| e | A charge of 0.5 C passes through a cross section of a conductor in 5 s. Find the current. | **[2]** |

Question 3

| a | Name the S.I. unit of force and define it. | **[2]** |

| b | Define the following: | **[2]** |
(i) Acceleration due to gravity.
(ii) Displacement.

| c | Calculate the length of a second's pendulum at a place where $g = 9.8$ ms^{-2} | **[2]** |

| d | State two applications of ultrasound. | **[2]** |

| e | The resistance of filament of a bulb will increase, remain unchanged or decrease when it glows. Give reason to support your answer. | **[2]** |

Question 4

| a | | **[2]** |
(i) Define Gravitational constant 'G'.
(ii) Define force.

| b | Define a fundamental unit. Give an example. | **[2]** |

c 'The value of (g) remains same at all places on the earth surface'. Is this statement true? Give reason for your answer. **[2]**

d Describe two ways for the efficient use of energy. **[2]**

e The separation between two consecutive crests in a transverse wave is 100 m. If wave velocity is 20 ms^{-1}, find the frequency of wave. **[2]**

Section II (40 Marks)

(Attempt **any four** questions from this section)

Question 5

a An observer sitting in line of two tanks, watches the flashes of two tanks firing at each other at the same time, but he hears the sounds of two shots 2 s and 3.5 s after seeing the flashes. If distance between the two tanks is 510 m, Find the speed of sound. **[3]**

b Draw symbol and state function of each of the following components in an electric circuit: **[3]**
   (i)   Cell
   (ii) Ammeter
   (iii) Rheostat

c (i) Name the instrument which can measure accurately the following: **[2]**
        a) The diameter of a needle.
        b) The internal diameter of the neck of a large bottle.

   (ii) What is a seconds pendulum? State its frequency. **[2]**

Question 6

a   A ball is thrown vertically upwards. It goes to a height of 20 m   **[3]**
    and then returns to the ground. Taking acceleration due to
    gravity g to be 10 ms^{-2}. Find:

(i)   The initial velocity of the ball.

(ii)   The final velocity of the ball on reaching the ground.

(iii)   The total time of journey of the ball.

b   **[3]**

(i)   How is nanometer related to angstrom?

(ii)   What is a light year?

(iii)   Is micron same as millimetre? Give reason.

c   **[4]**

(i)   What is meant by the term inertia?

(ii)   Name the two kinds of inertia.

(iii)   Name the factor on which inertia of a body depends.

(iv)   Two equal and opposite forces act on a moving object. How
       is its motion affected? Give reason.

Question 7

a   How are the wave velocity 'v', frequency 'f' and wavelength 'λ'   **[3]**
    of a wave related? Derive the relationship.

b   A car travels with a uniform velocity of 25 ms^{-1} for 5 s. The   **[3]**
    brakes are then applied and the car is uniformly retarded and
    comes to rest in further 10 s. Find:

(i)   The distance which the car travels before the brakes are
      applied.

(ii)   The retardation.

(iii)   The distance travelled by the car after applying the brakes.

c   Derive the following equations mathematically for a uniformly   **[4]**
    accelerated motion:

(i) $v = u + at$

(ii) $v^2 = u^2 + 2as$

Question 8

a   Give reason for the following: **[3]**

(i)   Athlete often lands on sand (or foam) after taking a high jump.

(ii) On shaking(giving jerks to) the branches of a tree, the fruits
      fall down.

(iii) When a hanging carpet is beaten with a stick, the dust
      particles start falling out of it.

b   State any three differences between propagation of sound
      waves and light waves.   **[3]**

c   **[4]**

(i)   A pebble thrown vertically upwards with an initial velocity 50
      ms^{-1} comes to a stop in 5 s. Find the retardation.

(ii) A particle initially at rest, moves with an acceleration 5 ms^{-2}
      for 5 s. Find the distance travelled in 4 s and in 5 s.

Question 9

a   Distinguish between speed and velocity.   **[3]**

b   Explain the following: **[3]**

(i)   Why does a person fall when he jumps out from a moving
      train?

(ii) Why does a glass vessel break when it falls on a hard floor,
      but it does not break when it falls on a carpet?

(iii) To move a boat ahead in water, the boatman has to push the
      water backwards by his oar.

c **[4]**

(i) State Ohm's law. Give it's mathematical expression .

(ii) Explain any two factors on which the resistance of a wire depends.

Question 10

a How long will sound take to travel in (a) an iron rail and (b) **[3]** air, both 3.3 km in length? Take speed of sound in air to be 330 ms^{-1} and in iron to be 5280 ms^{-1}.
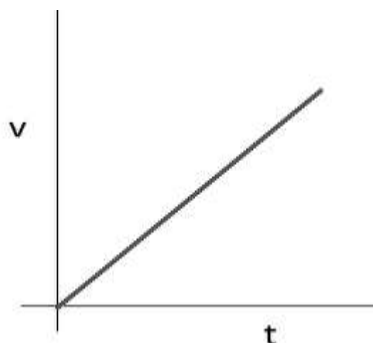
b (i) In the displacement-time graph given below, what information **[3]** do you get about the velocity.

(ii) In the displacement – time graph of two vehicles given below, A and B are moving along a straight road. Which vehicle is moving faster?
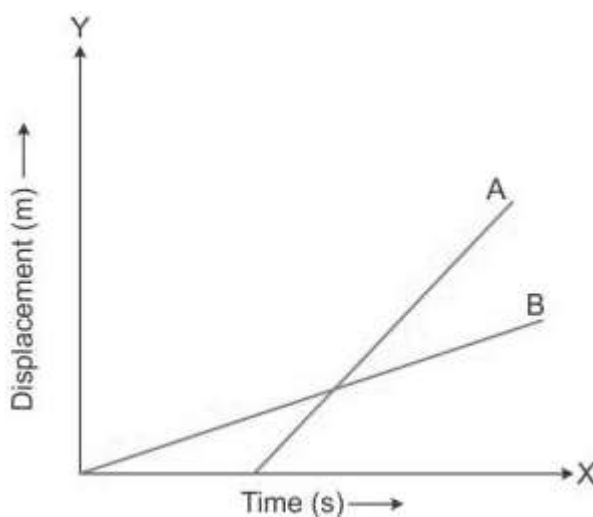
(iii)   State the type of motion represented by the graph shown below.

c   **[4]**

(i)   Define linear momentum. State its S.I. unit.

(ii)   Explain kilogram force and derive the relation : 1 kgf = 9.8 N.

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