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Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

ICT based CIE

on

B.Sc. II: Internal Examination of Thermal Physics, Statistical Mechanics-I, Waves and Optics-I

Conducted by

Mr. S. V. Malgaonkar

on

Date: 14-08-2021, Time: 11.00 am to 11.30 am

(2020 – 21)

B.Sc. (Part-II) Semester- III Examination Oct / Nov. 2020 Subject : Physics

Title: Thermal Physics and Statistical Mechanics-I and Waves and Optics-I

Paper No. : III

Date: 14-08-2021, Time: 11.00 am to 11.30 am

Attempt any 20

Total marks 40

* Indicates required question

1. Name *

2. PRN No. *

3. Seat No. *

4. Email ID *

5. 1. for monoatomic gas the number of degrees of freedom is ----- *

2 points

Mark only one oval.

a) 1

b) 2

c) 3

d) 4

6. 2. Boltzmann constant $k = \text{-----}^*$

2 points

Mark only one oval.

- a) R/N
- b) RN
- c) N/R
- d) $1/R$

7. 3. Thermal conductivity of gas is due to transfer of ----- *

2 points

Mark only one oval.

- a) momentum
- b) energy
- c) mass
- d) volume

8. 4. Out of the following, the physical quantity that relates with first law of thermodynamics is ----- * 2 points

Mark only one oval.

- a) temperature
- b) pressure
- c) energy
- d) volume

9. 5. In Carnot's cycle first step is ----- *

2 points

Mark only one oval.

- a) isothermal expansion
- b) adiabatic expansion
- c) isothermal compression
- d) adiabatic compression

10. 6. Zeroth law of thermodynamics deals with the ----- equilibrium of more than two macro systems.

* 2 points

Mark only one oval.

- a) thermal
- b) chemical
- c) mechanical
- d) electrical

11. 7. Heat engine converts heat into..... *

2 points

Mark only one oval.

- a) Light energy
- b) Mechanical energy
- c) Electric energy
- d) Magnetic energy

12. 8. The energy of an ideal gas molecule depend only on it's * 2 points

Mark only one oval.

- a) Volume
 b) Pressure
 c) Density
 d) Temperature

13. 9. Coefficient of diffusion (D) of gas is * 2 points

Mark only one oval.

- a) $D = \eta \rho$
 b) $D = \eta / \rho$
 c) $D = \rho / \eta$
 d) $D = 1 / \eta \rho$

14. 10. Coefficient of viscosity of gas is due to transfer of ----- * 2 points

Mark only one oval.

- a) momentum
 b) energy
 c) mass
 d) volume

15. 11. Adiabatic process occurs at constant ----- *

2 points

Mark only one oval.

- a) temperature
- b) pressure
- c) Heat
- d) volume

16. 12. Internal energy is a function of ----- *

2 points

Mark only one oval.

- a) state of the system
- b) path along which state changes
- c) pressure only
- d) temperature only

17. 13. Open system can exchange ----- with the surrounding *

2 points

Mark only one oval.

- a) both energy and matter
- b) only energy
- c) only matter
- d) only heat

18. 14. Principle of superposition is obeyed by----- * 2 points

Mark only one oval.

- a) homogeneous equation
 b) homogeneous and linear
 c) linear equation
 d) non- linear equation

19. 15. The resultant Lissajous figure of two SHM's in-phase, acting at right angles to each other and having frequencies in the ratio 2:1 is a----- * 2 points

Mark only one oval.

- a) Circle
 b) figure like number 8
 c) parabola
 d) ellipse

20. 16. In normal mode of oscillation the oscillating parts have ----- * 2 points

Mark only one oval.

- a) same frequency
 b) same amplitude
 c) same phase
 d) all the above

21. 17. Ultrasonics are ----- *

2 points

Mark only one oval.

- a) sound waves with frequency greater than 20,000 Hz
- b) sound waves with frequency less than 20,000 Hz
- c) waves travelling with velocity greater than that for sound waves
- d) waves travelling with velocity less than that for sound waves

22. 18. When sounding source in a closed space like a hall is cut-off, the intensity of sound -----

* 2 points

Mark only one oval.

- a) suddenly falls down to zero
- b) decreases linearly with time
- c) decreases exponentially with time
- d) remains constant with time

23. 19. Liquids are used as lubricant are of ----- viscosity *

2 points

Mark only one oval.

- a) low
- b) high
- c) zero
- d) infinity

24. 20. Which assumption are made while deriving the Poiseuille's formula for coefficient of viscosity? * 2 points

Mark only one oval.

- a) the flow of liquid is streamline
- b) there is no any radial flow
- c) the liquid in contact with the sides of the capillary tube is stationary
- d) all of the three above

25. 21. Rotor in the rotary pump is ----- * 2 points

Mark only one oval.

- a) rotated fast
- b) rotated inside the stator
- c) rotated eccentrically
- d) all the above

26. 22. The resultant of two SHM's acting at right angles to each other and same frequency, same amplitude but differing in phase by $\pi/2$ is ----- * 2 points
-

Mark only one oval.

- a) a straight line
- b) an ellipse
- c) an oblique ellipse
- d) a circle

27. 23. Spherical waves are ----- *

2 points

Mark only one oval.

- a) originated from point source
- b) divergent
- c) those in which energy goes on decreasing
- d) all the above

28. 24. Molecular pump can produce a vacuum as low as ----- *

2 points

Mark only one oval.

- a) 10^{-3} torr
- b) 10^{-5} torr
- c) 10^{-7} torr
- d) 10^{-9} torr

29. 25. For water, the coefficient of viscosity is ----- at 80 centigrade of its * 2 points
value at 10 centigrade.

Mark only one oval.

- a) double
- b) triple
- c) one fourth
- d) one third

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B.Sc. (Part-II) Semester- III Examination Oct / Nov. 2020 Subject : Physics

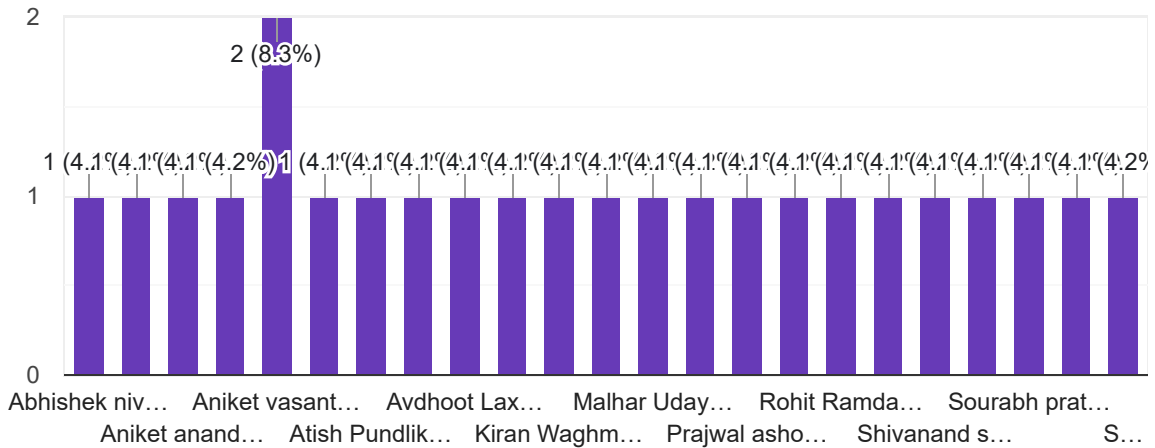
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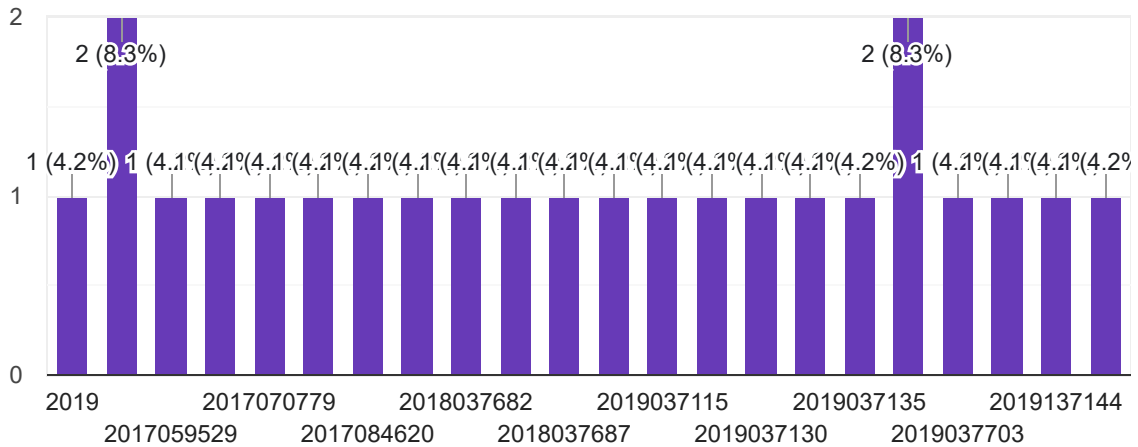
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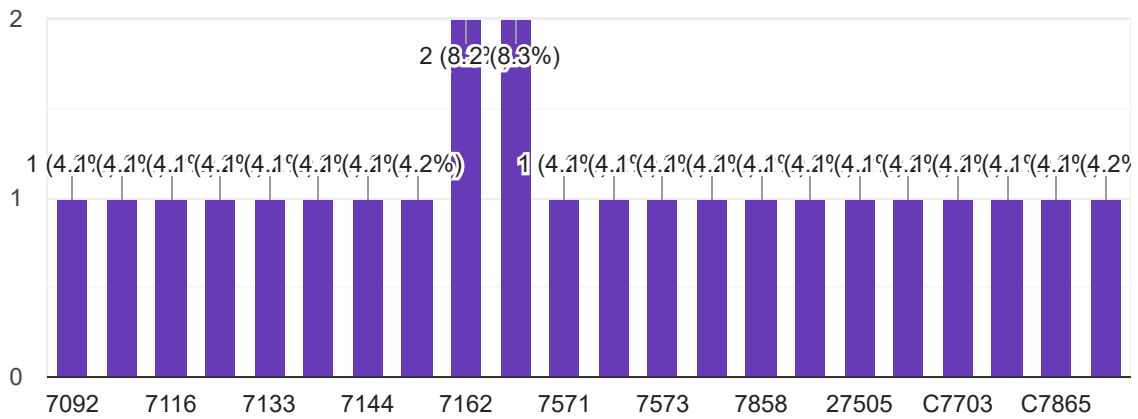
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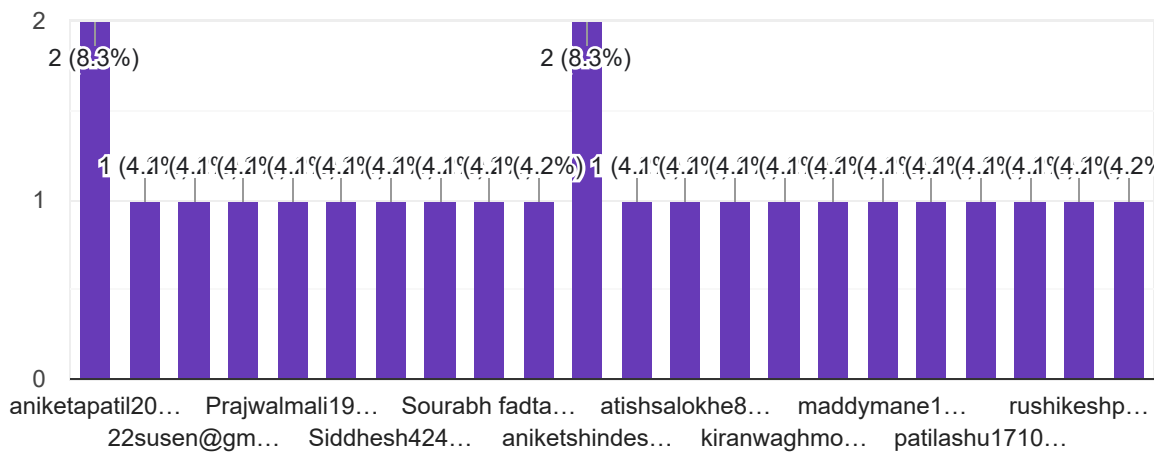
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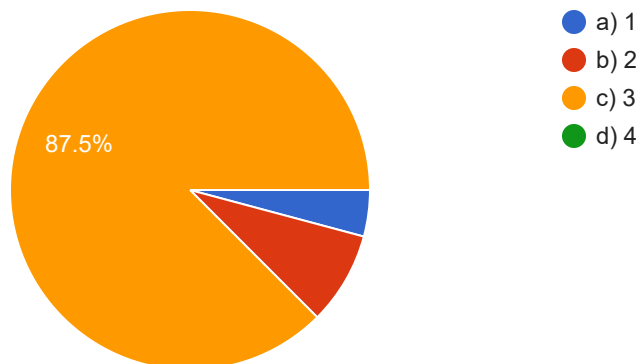
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1. for monoatomic gas the number of degrees of freedom is -----



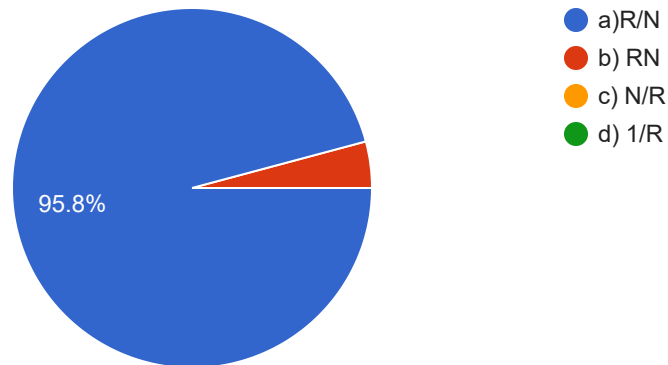
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2. Boltzmann constant $k =$ -----

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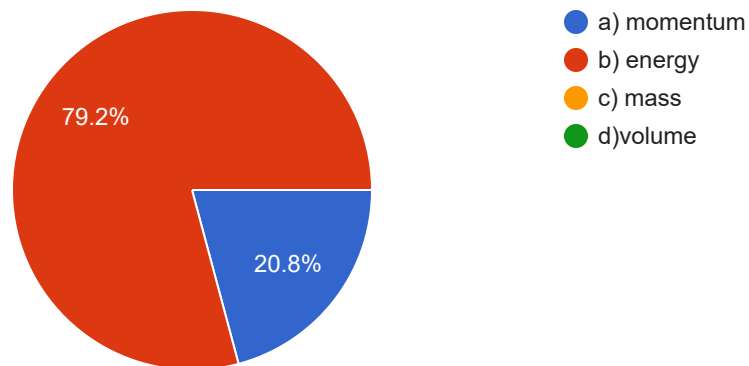
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3. Thermal conductivity of gas is due to transfer of -----

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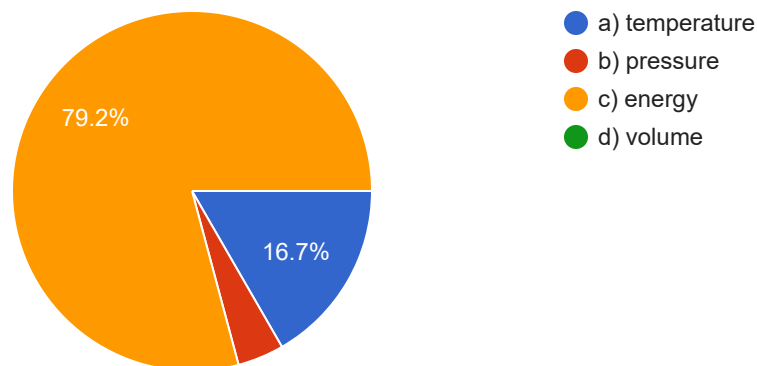
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4. Out of the following, the physical quantity that relates with first law of thermodynamics is -----

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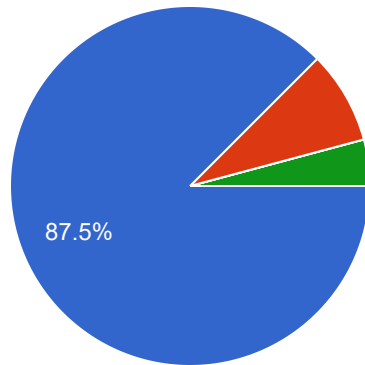
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5. In Carnot's cycle first step is -----

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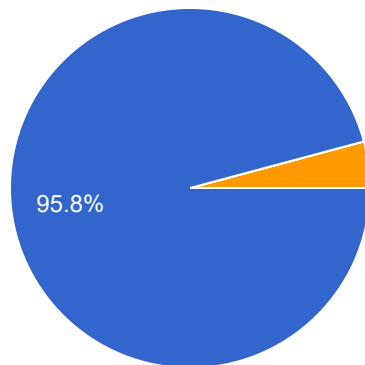


- a) isothermal expansion
- b) adiabatic expansion
- c) isothermal compression
- d) adiabatic compression

6. Zeroth law of thermodynamics deals with the ----- equilibrium of more than two macro systems.

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24 responses

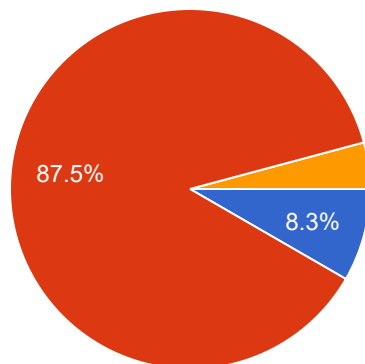


- a) thermal
- b) chemical
- c) mechanical
- d) electrical

7. Heat engine converts heat into.....

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24 responses



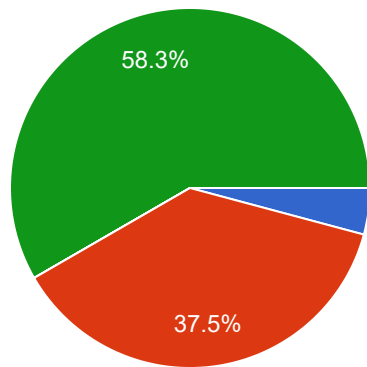
- a) Light energy
- b) Mechanical energy
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8. The energy of an ideal gas molecule depend only on it's

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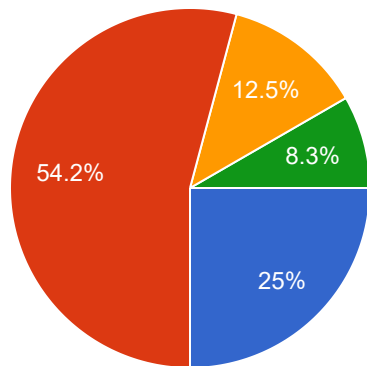


- a) Volume
- b) Pressure
- c) Density
- d) Temperature

9. Coefficient of diffusion (D) of gas is

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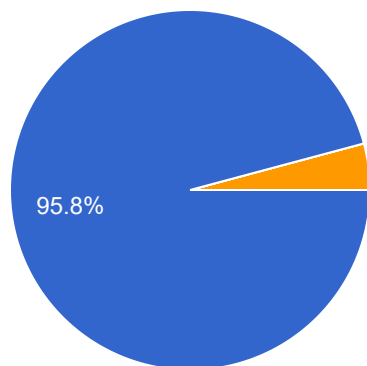


- a) $D=\eta\rho$
- b) $D=\eta/\rho$
- c) $D=\rho/\eta$
- d) $D=1/\eta\rho$

10. Coefficient of viscosity of gas is due to transfer of -----

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24 responses



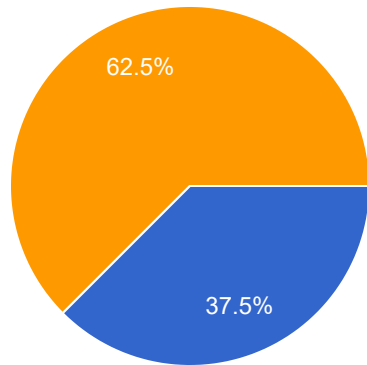
- a) momentum
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- c) mass
- d) volume



11. Adiabatic process occurs at constant -----

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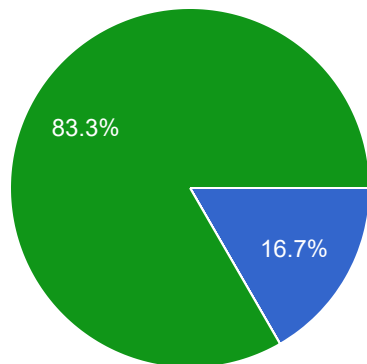


- a) temperature
- b) pressure
- c) Heat
- d) volume

12. Internal energy is a function of -----

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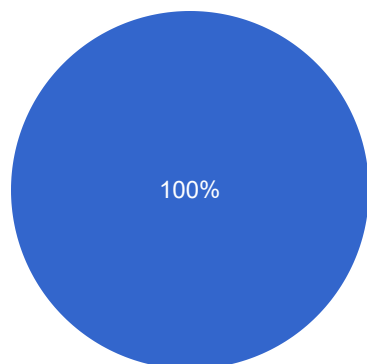


- a) state of the system
- b) path along which state changes
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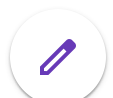
13. Open system can exchange ----- with the surrounding

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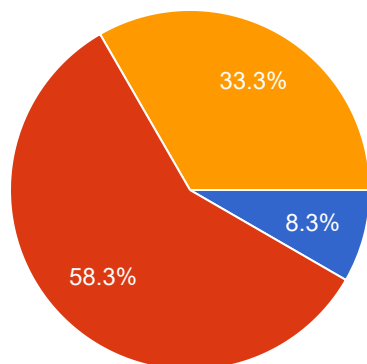
- a) both energy and matter
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14. Principle of superposition is obeyed by-----

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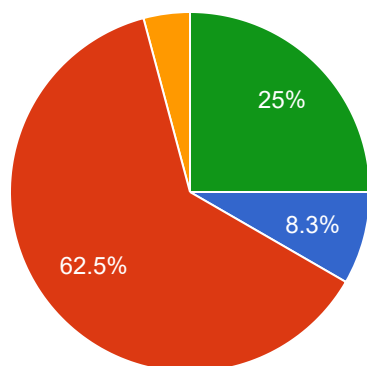


- a) homogeneous equation
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15. The resultant Lissajous figure of two SHM's in-phase, acting at right angles to each other and having frequencies in the ratio 2:1 is a-----

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24 responses

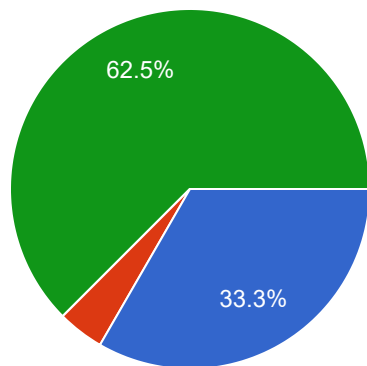


- a) Circle
- b) figure like number 8
- c) parabola
- d) ellipse

16. In normal mode of oscillation the oscillating parts have -----

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24 responses



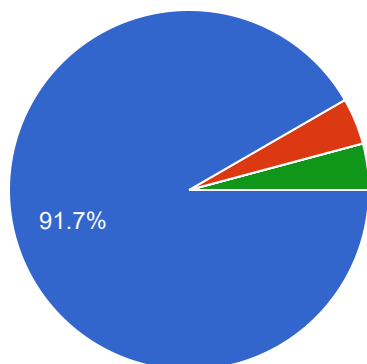
- a) same frequency
- b) same amplitude
- c) same phase
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17. Ultrasonics are -----



24 responses

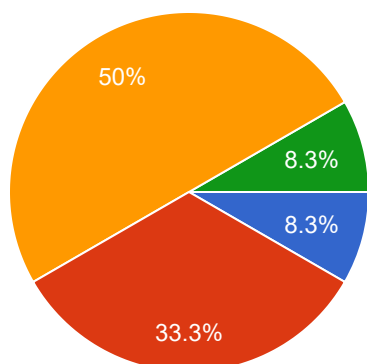


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24 responses

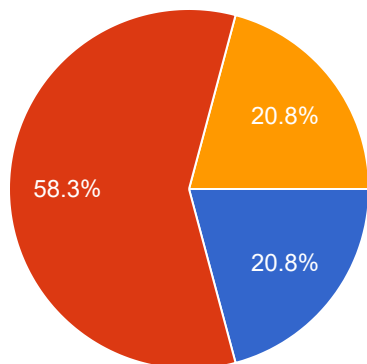


- a) suddenly falls down to zero
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19. Liquids are used as lubricant are of ----- viscosity



24 responses



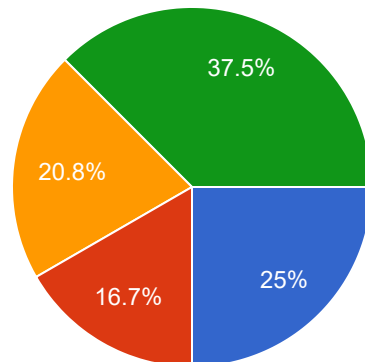
- a) low
- b) high
- c) zero
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20. Which assumption are made while deriving the Poiseuille's formula for coefficient of viscosity?



24 responses

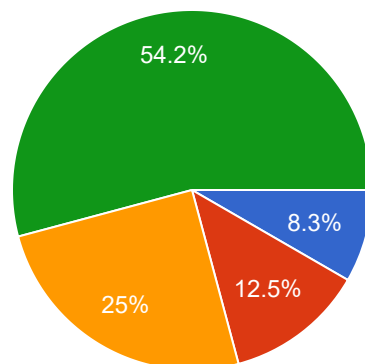


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21. Rotor in the rotary pump is ----



24 responses

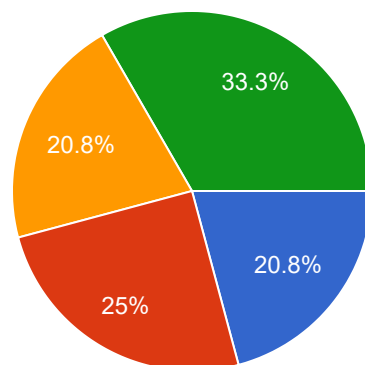


- a) rotated fast
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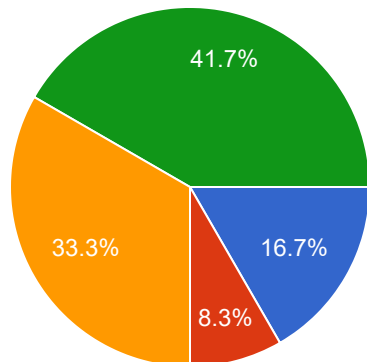
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23. Spherical waves are -----

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24 responses

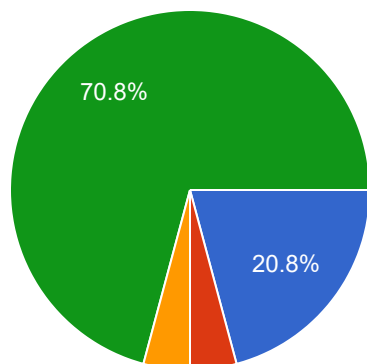


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24. Molecular pump can produce a vacuum as low as -----

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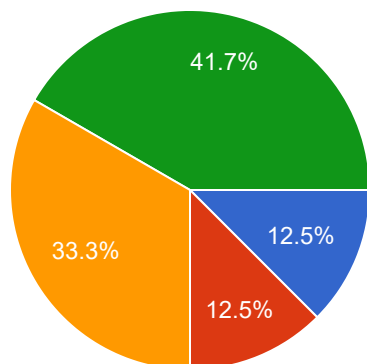


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25. For water, the coefficient of viscosity is ----- at 80 centigrade of its value at 10 centigrade.

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- a) double
- b) triple
- c) one fourth
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