



**DELHI PUBLIC SCHOOL NEWTOWN**  
**SESSION 2021-202**  
**FINAL TERM EXAMINATION**

**CLASS IX**  
**SUBJECT: PHYSICS**

**FULL MARKS: 80**  
**TIME: 2 HOURS**

*Candidates are allowed additional 10 minutes for only reading the paper. They must NOT start writing during this time.*

*The Question paper comprises two parts. Part I is based on Multiple Choice Questions and Part II contains Subjective/ Long Answer type questions.*

*The intended marks for questions or parts of questions are given in brackets [ ]*

*This paper consists of five printed pages*

**SECTION A(MCQ)**

1. The length of a simple pendulum is made one-fourth, then its time period becomes  
(a) one-fourth (b) doubled  
(c) halved (d) four times
2. Which of the following is not a social initiative for efficient usage of energy resources?  
(a) Collaboration with NGOs (b) Spreading awareness through mass-media  
(c) Imposing tax on companies (d) Eco club activities
3. The R.D. of a body of weight 1.5 kgf is 3. It weighs 0.9 kgf inside a liquid. The density of the liquid is  
(a) 900 kg/m<sup>3</sup> (b) 1200 kg/m<sup>3</sup>  
(c) 2700 kg/m<sup>3</sup> (d) 1800 kg/m<sup>3</sup>
4. Mexican wave in a stadium is an example of  
(a) Longitudinal wave  
(b) Transverse wave  
(c) Electromagnetic wave  
(d) None of the options
5. A wire used as a standard resistance is generally made of  
(a) copper (b) aluminium  
(c) manganin (d) lead-tin alloy
6. Filovirus usually has a size 80nm. How many of them can be accommodated in 2 m length?  
(a)  $40 \times 10^5$  (b)  $40 \times 10^6$   
(c)  $25 \times 10^9$  (d)  $25 \times 10^6$

7. If a car accelerates at the rate of  $3 \text{ m/s}^2$ , the increase in its velocity after 4 s is
  - (a) 6 m/s
  - (b) can't be determined, initial velocity is not given
  - (c) 3 m/s
  - (d) 12m/s
8. Near the sea level and at higher altitude, the decrease in density is
  - (a) rapid and slow
  - (b) 30% of the estimated drop in both cases
  - (c) uniform and non-linear
  - (d) more or less uniform in both cases
9. The height of water column exerting same pressure as 70 cm column of mercury is approximately 9.52m. The cross section of water column is doubled. New height is
  - (a) same as before
  - (b) 6 cm increased
  - (c) 4.36 m
  - (d) 10.4 m
10. The position of the source of light for a search light is
  - (a) between focus and centre of curvature of reflector
  - (b) at the focus
  - (c) at the centre of curvature of reflector
  - (d) close to pole
11. The resistance of filament of a bulb previously  $30 \Omega$  when illuminated will be
  - (a) comparable to  $30 \Omega$
  - (b) same as previous value
  - (c) greater than  $30\Omega$
  - (d) first higher than  $30 \Omega$  then drops
12. Action – reaction forces
  - (a) Act on same body in opposite direction
  - (b) Act on different bodies in opposite direction
  - (c) Act on different bodies in same direction
  - (d) Act on same body in same direction
13. A screw moves by 1 mm for two rotations, its pitch is
  - (a) 0.5 mm
  - (b) 1 mm
  - (c) 2 mm
  - (d) 0.25 mm
14. The expansion of solids, liquids and gases on heating follow the trend
  - (a) Gases < liquids < solids
  - (b) Gases > Liquids < solids
  - (c) Solids < liquids < gases
  - (d) Liquids < gases < solids
15. If 4000 joule of work is required to transfer 10C of charge between two points of a resistor of  $50 \Omega$ . The current passing through it is
  - (a) 2A
  - (b) 6A
  - (c) 4A
  - (d) 8A
16. The numerical value of ratio of displacement to distance for a moving object is
  - (a) <1
  - (b) >1
  - (c) < or = 1
  - (d) > or =1
17. Which one is constant for a given medium?
  - (a) Wavelength
  - (b) Wave velocity
  - (c) Time period
  - (d) Frequency

18. The apparent weight of a body (weight in air is  $W$ ) just floating on water surface  
 (a) is zero (b)  $<W$  or  $= W$   
 (c)  $<W$  (d) can be 0 or  $>W$
19. The displacement versus  $t^2$  graph for a freely falling body will be  
 (a) a curve sloping upwards (b) straight line with positive slope  
 (c) line parallel to displacement axis (d) line with negative slope
20.  $1 \text{ N/m}^2$  pressure in SI unit if measured in CGS system is numerically equal to  
 (a)  $0.01 \text{ dyne/cm}^2$  (b)  $104 \text{ dyne/cm}^2$   
 (c)  $100 \text{ dyne/cm}^2$  (d)  $10 \text{ dyne/cm}^2$
21. The velocity ratio for all hydraulic machines is  
 (a) Zero (b) greater than 1  
 (c) less than 1 (d) difficult to ascertain in reality
22. When pure water is cooled from  $4^\circ\text{C}$  to  $0^\circ\text{C}$ , it  
 (a) First expands, then contract (b) expands  
 (c) contracts (d) contracts and then expand
23. The speed of sound increases by about \_\_\_\_\_ for each  $^\circ\text{C}$  rise in temperature  
 (a)  $33 \text{ cm/s}$  (b)  $330 \text{ cm/s}$   
 (c)  $61 \text{ cm/s}$  (d)  $14.5 \text{ cm/s}$
24. Which one of the following is not true about magnetic field?  
 (a) Lines are closed continuous curves (b) They behave as contracted rubber bands  
 (c) Lines don't intersect (d) Earth's field is uniform in limited space
25. The working principle of AC ammeters or voltmeters is based on  
 (a) Heating effect of current (b) Ohm's law  
 (c) rate of flow of charges (d) conventional direction of current
26. For an incident ray directed towards centre of curvature of a spherical mirror, reflected ray  
 (a) passes through pole (b) is parallel to principal axis  
 (c) retraces its path (d) passes through focus
27. A gradual decrease in barometric height indicates  
 (a) dry weather (b) possibility of a storm  
 (c) extremely dry weather (d) possibility of rain
28. In a stationary liquid pressure at all points on a horizontal plane  
 (a) is non uniform (b) same  
 (c) falls linearly (d) increases linearly with separation between points

29. A body is first weighed in vacuum and then in air. The correct statement is

- (a) Both weights are same
- (b) Weight in vacuum is zero
- (c) Weight in vacuum is more
- (d) Weight in air is more

30. For construction of magnetic compass, the choice of material is

- (a) Steel
- (b) alloy of copper and zinc
- (c) soft iron
- (d) nickel

### SECTION B

(Question 1 is compulsory. Attempt any four questions from the rest of the questions)

Question 1

[2+2+2+2+2]

- a) Mention one merit and one demerit of using solar panels.
- b) Locate the image position for a concave mirror when object is at centre of curvature.  
Is the size of the image magnified or diminished?
- c) State two merits of aneroid barometer over a Fortin's barometer.
- d) Define one gram force. How is it related to dyne?
- e) A cyclist riding along a level road suddenly stops pedaling. Why doesn't he come to rest immediately?

Question 2

[3+3+4=10]

- a) Which three properties of a medium is required for propagation of sound?
- b) Define Gravitational constant G. How does gravitational force obey the inverse square law? Mention the relationship between g and G.
- c) State any three laws of liquid pressure. Hence state Pascal's law.

Question 3

[4+3+3=10]

- a) A bullet of mass 50 g moving with a speed 100 m/s strikes a plank and comes to rest after penetrating 2 cm into the plank. Determine
  - (i) initial and final momentum of the bullet
  - (ii) retardation offered by the plank and
  - (iii) resistive force exerted by the plank.
- b) Express
  - (i) 1 micron in Å
  - (ii) 1 u in kg
  - (iii) 1 ns in s
- c) State how v- t graph is utilized to find the
  - (i) distance travelled in a given time
  - (ii) displacement in a given time and
  - (iii) acceleration.

Question 4

[3+4+3=10]

- a) Bring out three distinctive features between heat and temperature.

- b) How does image position shift in a convex mirror as object is moved away from the mirror? If size of image is one-third that of object for a convex mirror of focal length 18 cm, find object position.
- c) Highlight three merits of using a secondary cell over a primary cell.

**Question 5**

[3+4+3=10]

- a) Write any three factors that influence resistance of a conductor and the manner in which resistance gets affected.
- b) Draw the magnetic field lines of a bar magnet when its N pole faces geographic north. Mark the neutral points as X and Y. Mention their significance.
- c) Which two functions does a galvanometer perform? Why does a voltmeter have high resistance?

**Question 6**

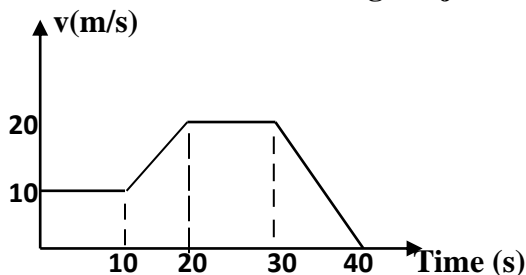
[4+3+3=10]

- a) What is an electromagnet? Write three advantages of it over a permanent magnet.
- b) What is meant by induced magnetism? How do you justify that induction precedes attraction?
- c) Define 1V potential difference across a conductor of a given length. State Ohm's law and hence define 1 ohm.

**Question 7**

[3+4+3=10]

- a) Draw a simple electric circuit with the following components.  
Cell, key, rheostat, ammeter, load and voltmeter.
- b) The velocity-time graph for a body is shown in the figure. Answer the following:
  - (i) calculate the acceleration during the time interval 10s to 20s.
  - (ii) find the distance covered in first 20s.
  - (iii) time interval when moving with zero acceleration.
  - (iv) find the retardation during the journey.



- c) Complete the following ray diagram to show the reflection by the mirrors placed perpendicular to each other.

