

# Dinajpur Board 2016

Physics

Subject Code 

1	3	6
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Time — 2 hours 10 minutes

Creative Essay Type

Full marks — 40

[N.B. -The figures in the right margin indicate full marks. Answer any four Questions.]

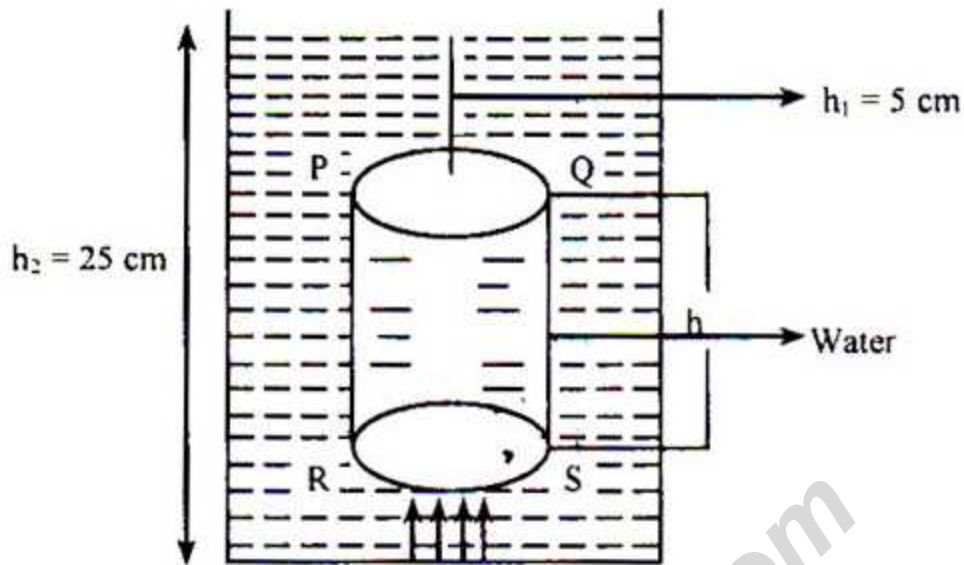
1. ★ Due to applying force upon a toy car of weight 3.92N, it starts to move with an acceleration  $0.5\text{ms}^{-2}$  on the floor where frictional force is 0.5N.

- a. What is acceleration due to gravity? 1
- b. The weight of any body is zero at the centre of the earth. Explain. 2
- c. Calculate the force acting upon the car. 3
- d. Will you get any change in acceleration due to frictional and frictionless floor? Evaluate mathematically. 4

2. ► Mass of Jony and Rony are respectively 40 kg and 50 kg. Jony and Rony can stair up 20 steps of 20 cm height each in 10s and 18s respectively. [Acceleration due to gravity is  $9.8\text{ms}^{-2}$ ]

- a. What is efficiency? 1
- b. 'Searching alternative fuel of fossil fuel is very important'— Explain. 2
- c. Calculate work done by Jony. 3
- d. Through Rony's work is more but Jony is ahead in power. Evaluate the statement. 4

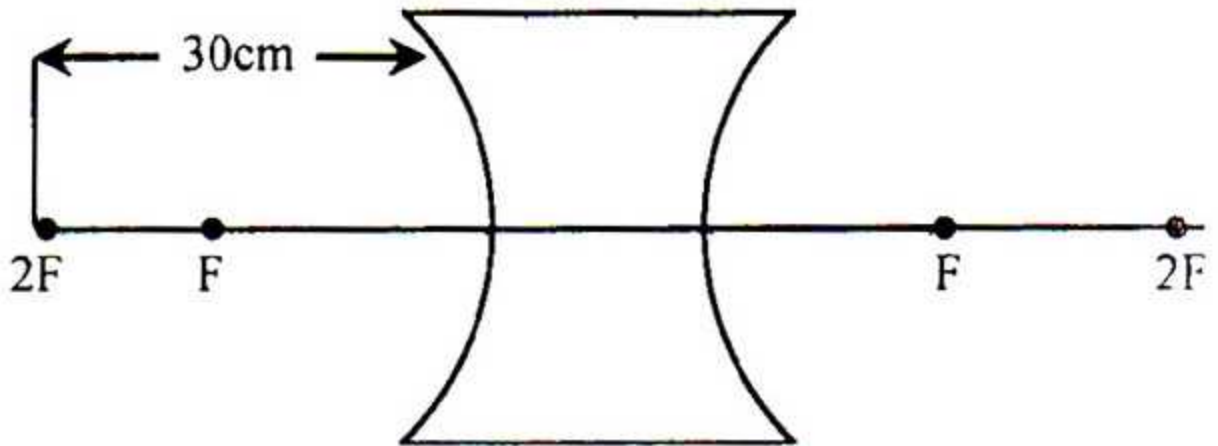
3. ► Observe the figure below:—



Area of PQ surface is  $25 \text{ cm}^2$

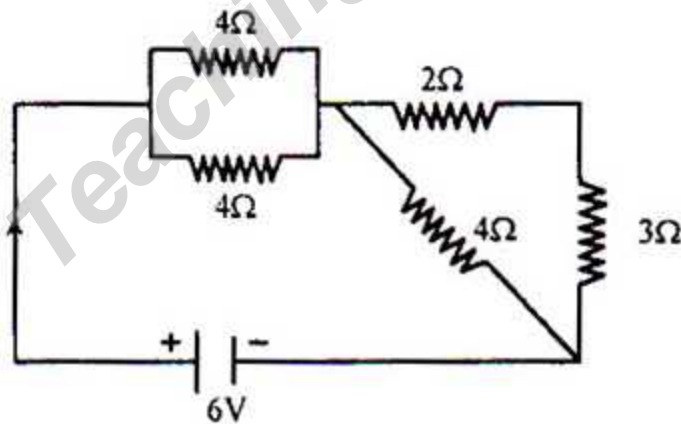
- a. What is strain? 1
  - b. What do you mean by Torricelli's vacuum? 2
  - c. Calculate the pressure on the PQ surface. 3
  - d. Is the information given in the stem supporting Archimedes law? Analyze mathematically. 4
4. ★ A man fired from a gun standing between two parallel hills. He got two echos after 1.5 s and 2s later from firing. That day the temperature was  $30^\circ\text{C}$ .
- a. What is echo? 1
  - b. Velocity of sound in water is more than that in air medium. Explain. 2
  - c. Calculate the distance between the mentioned hills. 3
  - d. Will the man be able to hear 3rd and 4th echo separately? Analyze mathematically. 4

5. ► Observe the given figure:—



- What is lens? 1
- Explain diffused reflection. 2
- Determine the power of lens. 3
- How can you remove the eye defect with the help of given lens? Explain with ray diagram. 4

6. ★ Follow the given circuit:—



- What is generator? 1
- Explain why internet is called mother of all network. 2
- Calculate equivalent resistance for the given circuit. 3
- Will you get any change in current flow if all the resistors are connected in parallel? Analyze mathematically. 4



[Fill the circle completely (●) with the correct or most appropriate answer, corresponding to the question number. Make sure to use a ball point pen. Each question carries 1 mark.]

1. Who discovered the radioactivity of Uranium?

- (a) Roentgen (b) Newton  
(c) Niels Bohr (d) Becquerel

2. Which of the following is correct in terms of falling bodies?

- (a)  $t \propto h^2$  (b)  $h \propto t^2$   
(c)  $h \propto t^2$  (d)  $h \propto \frac{1}{t}$

3. Who defined the terms—displacement, motion and acceleration?

- (a) Galileo (b) Newton  
(c) Huygen (d) Robert Hooke

4. ★ What is the measure of inertia?

- (a) Contact force (b) Non-contact force  
(c) Mass (d) Weight

5. Fundamental quantities—

- i. do not depend on other quantities  
ii. will not change with the time evolving  
iii. are derived quantity

Which one of the following is correct?

- (a) i and ii (b) i and iii  
(c) ii and iii (d) i, ii and iii

Answer to the questions No. 6 and 7 in the light of the following stem :—

Force is applied on an object in such a way that the angle between applied force and the displacement is  $\theta$  the work done is  $W$ .

6. What will be the measure of the angle  $\theta$  in degree if the  $W = 0$ ?

- (a) 30 (b) 60  
(c) 90 (d) 180

7. What will be the measure of  $\theta$  in degree if the measure of work ' $W$ ' is the highest?

- (a) 180 (b) 90  
(c) 45 (d) 0

8. Which part of the eye is constituted with the nerve-fibers rods and cones?

- (a) Cornea (b) Eye-lens  
(c) Retina (d) Pupil

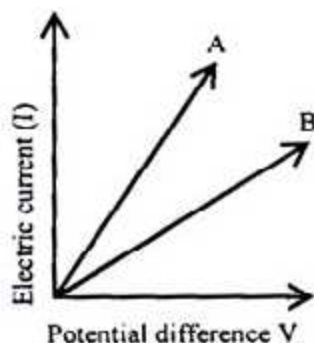
9. A body from a place moved 4m directly towards the east and from there it travelled 3m towards the north. What will be the difference between the distance and displacement of the body in metre?

- (a) 7 (b) 5  
(c) 2 (d) 1

10. What  $P_s$  pressure will be at the bottom of a pond if the depth of water in it is 1 m?

- (a) 9.8 (b) 98  
(c) 980 (d) 9800

11.



In case of the electric conductor marked above with 'A' and 'B'.

- i. 'A' is a better conductor than 'B'  
ii. 'B' is a better conductor than 'A'  
iii. Resistance of 'B' is greater than 'A'

Which one of the following is correct?

- (a) i and ii (b) i and iii  
(c) ii and iii (d) i, ii and iii

12. What is the name of the fourth state of matter?

- (a) Plasma (b) Solid  
(c) Liquid (d) Gas

13. What will it be in calorie equal to one joule?

- (a) 0.42 (b) 0.24  
(c) 2.4 (d) 4.2

14. ★ What the angle in degree will be between the normal at the point of incidence and the reflector?

- (a) 180 (b) 120  
(c) 90 (d) 45

15. Which wave of the following does not require any medium for its transmission?

- (a) Sound wave  
(b) Mechanical wave  
(c) Electromagnetic wave  
(d) Water wave

16. When does blood come out through the nose of a human if the internal blood pressure is risen?

- (a) Atmospheric pressure < human blood pressure  
(b) Atmospheric pressure > human blood pressure  
(c) Atmospheric pressure = human blood pressure  
(d) Both the atmospheric pressure and human blood pressure fluctuate

17. What will be the conductivity if any conductor is placed in a potential difference of 220 volts with resistance of  $0.25\Omega$ ?

- (a)  $880\Omega^{-1}$  (b) 880A  
(c)  $4\Omega^{-1}$  (d) 4A

18. The temperature of any object does not increase even though more heat is given after reaching its melting point since—

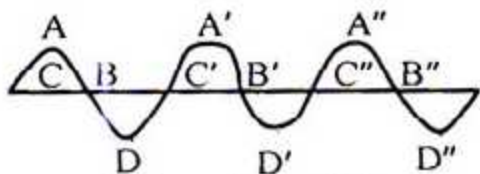
- i. the heat is mainly used for the transformation of state of the object  
ii. the heat is really wasted in the surrounding environment  
iii. the heat provides the required energy for breaking the bond in between the molecules of the object

Which one of the following is correct?

- (a) i and ii (b) i and iii  
(c) ii and iii (d) i, ii and iii



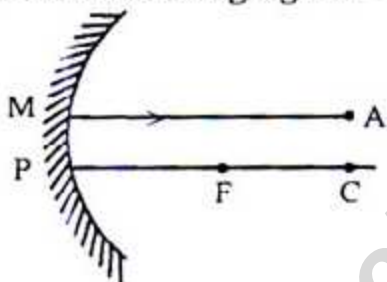
19. Which one of the following is the function of a rectifier?  
 (a) Increases the electric current  
 (b) Amplify voltage  
 (c) Decrease the electric current  
 (d) Makes the electric current unidirectional
20. ★ What is the unit of electric charge?  
 (a) Ampere (b) Coulomb  
 (c) Volt (d) Ohm
21. Which one of the following does show the highest melting point?  
 (a) Copper (b) Silver  
 (c) Nichrome (d) Tungsten
- 22.



In case of the points of the same phase which one of the following is correct?

- (a) A, B, D (b) A, A', A''  
 (c) A', B', C' (d) A'', B'', D''
23. What will be the force of attraction or repulsion between the two point changes if the distance between them becomes twice?  
 (a) Two times (b) Four times  
 (c) Half (d) One-fourth

Answer to the question No. 24 and 25, according to the following figure:—



24. Which point of direction will the light ray be reflected through?  
 (a) F (b) C  
 (c) A (d) The middle of P and F

25. The nature of the image will be—  
 i. real  
 ii. virtual  
 iii. inverse

Which one is correct?

- (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
26. ★ Which of the following does use the mutual induction in its mode of function?  
 (a) Transistor (b) Dynamo  
 (c) Amplifier (d) Transformer

27. What is the function of a camera in television transmission?

- (a) To convert the sound waves into picture  
 (b) To convert the picture into sound waves

- (c) To convert the electrical signals into picture  
 (d) To convert the picture into electrical signals

28. What is it called by which the interior wall of a stomach is examined using light travelling tubes?

- (a) Endoscopy (b) Ultrasonography  
 (c) CT Scan (d) Angiography

29. Which one of the following relationship is correct in case of a transformer?

- (a)  $E_p I_p = E_s I_s$  (b)  $E_p n_p = E_s n_s$   
 (c)  $\frac{E_p}{E_s} = \frac{I_p}{I_s}$  (d)  $\frac{I_p}{I_s} = \frac{n_p}{n_s}$

30. ★ What will be the electric intensity in  $\text{NC}^{-1}$  if a body of charge 15C is placed at a point in an electrical field having a force of 45N?

- (a)  $\frac{1}{3}$  (b) 3  
 (c) 30 (d) 60

31. If an object is kept 20 cm away from a convex lens, an image to its opposite direction of the lens will be produced in a distance of 20 cm. What will be its focal length in centimetre?

- (a) 20 (b) 15  
 (c) 10 (d) 5

32. It is dangerous to stay under any tree during storm and rain since—

- i. electricity always passes following the shortest path  
 ii. soil and water are electric conductors  
 iii. electricity passes on earth through an object of high position

Which one of the following is correct?

- (a) i and ii (b) ii and iii  
 (c) i and iii (d) i, ii and iii

33. The brake was drawn to stop a car running at the speed of 60 kmph. What will be the kinetic energy of the car in Joule if the mass of it is 5000 kg?

- (a)  $6.94 \times 10^5$  (b)  $5.94 \times 10^5$   
 (c)  $5.5 \times 10^6$  (d)  $6.37 \times 10^6$

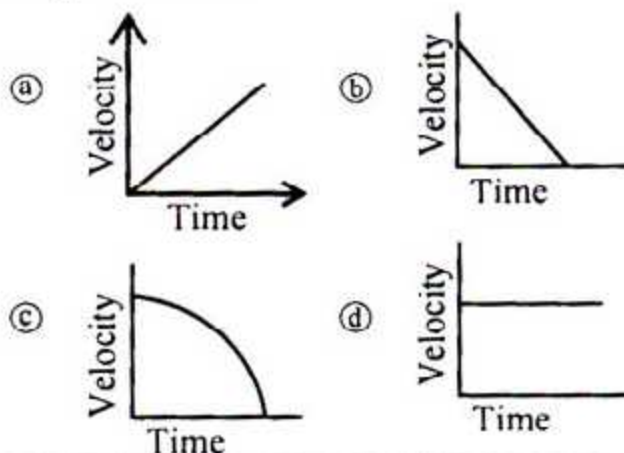
34. The ways of limiting the friction are—

- i. to smooth the friction surface  
 ii. to use lubricant  
 iii. to use a machine which requires low friction point

Which one of the following is correct?

- (a) i and ii (b) ii and iii  
 (c) i and iii (d) i, ii and iii

35. ★ Which figure below does represent the motion of an object thrown opposite to gravitation?



Ans.	1	(d)	2	(b)	3	(a)	4	(c)	5	(a)	6	(c)	7	(d)	8	(c)	9	(c)	10	(d)	11	(c)	12	(a)	13	(b)	14	(c)	15	(c)	16	(b)	17	(c)	18	(b)	19	(d)	20	(b)
	21	(d)	22	(b)	23	(d)	24	(b)	25	(b)	26	(d)	27	(d)	28	(a)	29	(a)	30	(b)	31	(c)	32	(c)	33	(b)	34	(d)	35	(b)										