

# Jashore Board 2016

Physics


Subject Code 136

Time— 2 hours 10 minutes

Creative Essay Type

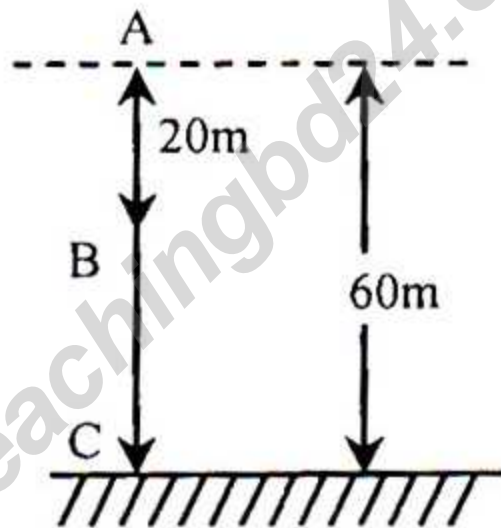
Full marks—40

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

1.  A truck of mass 600 kg starts from rest moving uniform acceleration  $0.2\text{ms}^{-2}$ , after 60s collides with stationary pick-up van of mass 400kg gets locked with it and moves together with velocity  $7.2\text{ms}^{-1}$ .


- What is sliding friction? 1
- Write two differences between balanced and unbalanced forces. 2
- On the basis of the above stem how far distance the truck will cover before collision with the pick-up van? 3
- Does the above phenomenon support the principle conservation of momentum? Give your opinion. 4

2. 



While loading 10 nos. cement bag to a cargo lift of a building of 60m height, at a height of 60m the steel cable of cargo lift snapped resulting free fall of cargo lift. Mass of cargo lift alone is 50 kg.

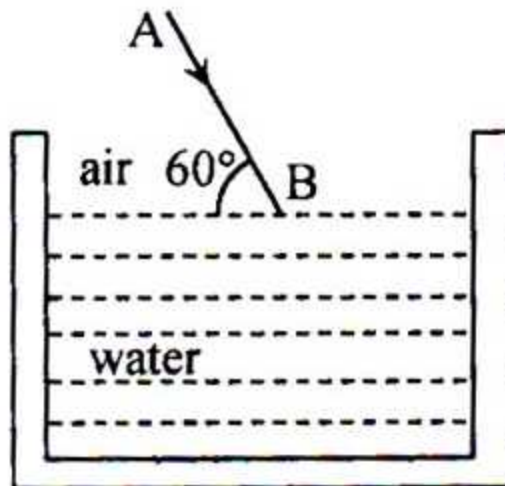
- Define kinetic energy. 1
- In all respect, equal work cannot be done by applying force— Explain. 2
- On the basis of the above stem, calculate total energy at point B when the total mass of cargo lift with cement is 550 kg. 3
- At point B if nos. cement bag are accidentally separated from cargo lift what percentage change of total energy at point B will occur? Explain with mathematical analysis 4

3.  A body of mass 2.5kg having length, breadth and height 25cm, 15cm and 5cm respectively.

- State Hooke's law? 1
- Why the atmospheric pressure changes with the changes of altitude? 2

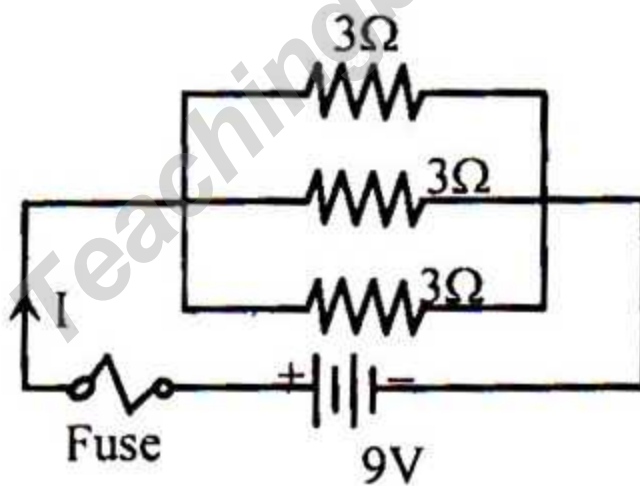
- c. Object of the above stem when placed on floor, calculate the highest and lowest magnitude of pressure that will exert on the floor. 3
- d. The object of the stem is placed in water of  $4^{\circ}\text{C}$ , whether it will float or immersed in the water? Explain with mathematical analysis. 4

4. ►



- a. What is critical angle? 1
- b. What are the conditions of total internal reflection? 2
- c. AB incident light ray changes its direction about  $11^{\circ}$ . Calculate refracted index of water with respect to air. 3
- d. Pot of the above stem was filled with up sea water and formed refraction index 1.4. Then how much refracted ray will deviate from incident ray? Explain with mathematical analysis. 4

5. ★



- a. What is charge? 1
- b. Express 1KW in Joule. 2
- c. Calculate equivalent resistance above circuit. 3
- d. Without changing in the value of resistance to get 24 current in the circuit, how the resistance will be arranged? Explain the diagram. 4

6. ► Raju went to doctor suffer with whole abdomen pain. After full investigation doctor confirmed Raju's has gallbladder stone by X-ray.

- a. Define isotope. 1
- b. Why 'dye' is used in during angiography? 2
- c. How X-ray is produced? Discuss. 3
- d. Is it possible to examine Raju's gallbladder stone by using another medical instrument? Discuss logically. 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. Intestinal obstruction can be identified by which instrument?

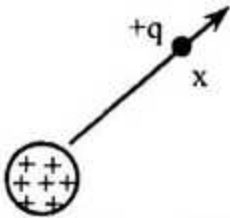
- (a) ECG (b) Endoscopy  
(c) Ultrasonography (d) X-ray

2. ★  $F = C \frac{q_1 q_2}{d^2}$

Which one of the following is the value of C?

- (a)  $9 \times 10^{-9} \text{Nm}^2 \text{C}^{-2}$   
(b)  $9 \times 10^9 \text{Nm}^2 \text{C}^{-2}$   
(c)  $2.25 \times 10^{12} \text{Nm}^2 \text{C}^{-2}$   
(d)  $3 \times 10^8 \text{Nm}^2 \text{C}^{-2}$

3.



At point x the experienced force is—

- i. electric field  
ii. electric intensity  
iii. electric force

Which one of the following is correct?

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

4. The specific resistance of which material is  $5.5 \times 10^{-8} \Omega \text{m}$ ?

- (a) Nichrome (b) Tungsten  
(c) Copper (d) Silver

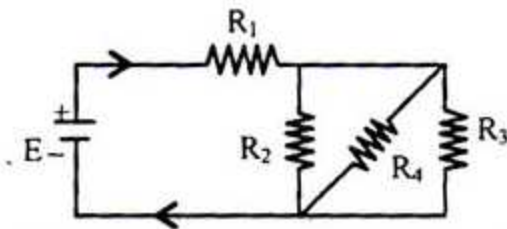
5. For decoration purpose in wedding ceremony, the circuit used is—

- i. series circuit  
ii. parallel circuit  
iii. parallel combination circuit

Which one is correct?

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

6.



If  $E = 6\text{V}$ ,  $R_1 = 100\Omega$ ,  $R_2 = 50\Omega$ ,  $R_4 = 75$ , then what will be the flow of current through  $R_3$ ?

- (a) 0.05A (b) 0.0125A  
(c) 0.03A (d) 0.02A

\* Note: → Here the value of  $R_3$  is not given. If  $R_3 = 60\Omega$ , then the answer will be (a).

7. Who gives theory of relativity?

- (a) Max Planck (b) Becquerel  
(c) Rutherford (d) Albert Einstein

8. Ritu can use which instrument to measure the area of cross section of a wire?

- (a) Meter scale (b) Slide callipers  
(c) Screw gauge (d) Balance

9. ★ The velocity of an object A decreases

uniformly from  $15\text{ms}^{-1}$  and after 3 seconds it becomes  $5\text{ms}^{-1}$ . What is the acceleration in this case?

- (a)  $3.3\text{ms}^{-2}$  (b)  $3.33\text{ms}^{-2}$   
(c)  $-6.678\text{ms}^{-2}$  (d)  $-3.33\text{ms}^{-2}$

A piece of ice dropped into boiled water, it is seen that the ice melts gradually and the temperature of boiled water is decreasing.

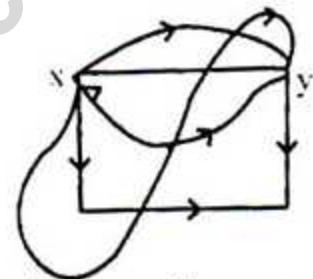
10. How long time will be taken to exchange of heat between the water and ice?

- (a) Until the whole ice has melted completely  
(b) Until the temperature of water reaches at zero  
(c) Until the temperature of water and ice melted water became not equal  
(d) Until the water condensed into ice or converted into vapour

11. Which one of the following is equation of g?

- (a)  $g = \frac{GM}{R}$  (b)  $g = \frac{GM}{R^2}$   
(c)  $g = \frac{R}{GM}$  (d)  $g = \frac{R^2}{GM}$

12.



In figure the linear distance of xy is—

- (a) value of acceleration  
(b) value of displacement  
(c) value of speed  
(d) value of distance

13. A bullet of mass 10gm was shot from a gun with a velocity of  $400\text{ms}^{-1}$ . If the

mass of the gun is  $1\frac{1}{2}\text{kg}$ , then what is the backward velocity?

- (a)  $2.67\text{ms}^{-1}$  (b)  $6.67\text{ms}^{-1}$   
(c)  $-6.688\text{ms}^{-1}$  (d)  $-2.67\text{ms}^{-1}$

14. Which one is the dimension of momentum?

- (a)  $\text{MLT}^{-2}$  (b)  $\text{MLT}^{-1}$   
(c)  $\text{MLT}^2$  (d)  $\text{LT}^{-1}$

15. ★ Nirob applied a pulling force when he pulled a toy car on a floor. Applied force is what type of force?

- (a) Contact force (b) Non-contact force  
(c) Balanced force (d) Unbalanced force

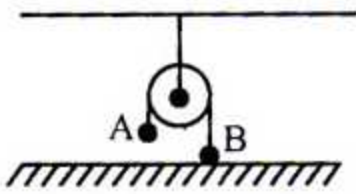
16. What will be the potential energy of a body of mass 7 kg if it is raised to a height of 2000 cm above the surface of the earth? [ $g = 9.8\text{ms}^{-2}$ ]

- (a) 1372 J (b) 32.67 J  
(c) 1176 J (d) 1376 J

17. If we throw stones at mango it may fall down for which energy?

- (a) Used energy (b) Potential energy  
(c) Kinetic energy (d) Solar energy

18.



Which energy is stored at point A?

- (a) Kinetic energy (b) Mechanical energy  
(c) Nuclear energy (d) Potential energy

19. If the density and mass of an object is  $1000 \text{ kgm}^{-3}$  and  $200 \text{ kg}$  respectively, then what its volume?

- (a)  $0.2 \text{ m}^3$  (b)  $0.5 \text{ m}^3$   
(c)  $2.75 \text{ m}^3$  (d)  $2.8 \text{ m}^3$

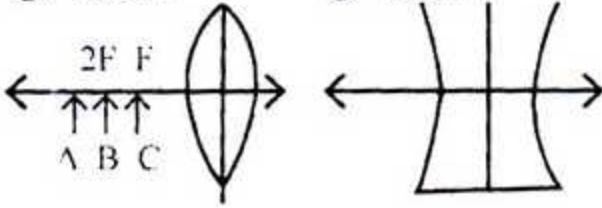


Figure-1

Figure-2

In figure there are two lenses. Answer the question Nos. 20 and 21 in the light of above figures.

20. What will be the nature of image if the object is placed at position A?

- i. Diminished ii. Real  
iii. Inverted

Which one is correct?

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

21. For the above figures—

- i. In figure-1, for the position of C virtual image will be formed  
ii. In figure-1, for the position of B virtual image will be formed  
iii. In figure-2, always virtual image will be formed

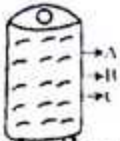
Which one is correct?

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

22. Which one of the following is the equation of Buoyancy?

- (a)  $vpg$  (b)  $hpg$   
(c)  $(hA)p$  (d)  $Ahpg$

23.



From which hole the water traversed more distance?

- (a) A (b) B  
(c) C (d) Same distance traversed for all holes

24. The temperature of body of an adult man is  $98.4^\circ\text{F}$ . What would be the reading in Celsius scale?

- (a)  $36.89^\circ\text{C}$  (b)  $73^\circ\text{C}$   
(c)  $24.33^\circ\text{C}$  (d)  $44.93^\circ\text{C}$

25. The sum of the kinetic and potential energy of the molecules of a substance is called which energy?

- (a) Stored energy  
(b) Absolute potential energy  
(c) Absolute kinetic energy  
(d) Internal energy

26. Surid takes some water in a bowl and keep it on a table. After two days he observed that there was no water in the bowl. What is called this process?

- i. Evaporation

- ii. Boiling iii. Condensation

Which one is correct?

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

27. The strengthness of magnet can be increased—

- i. by increasing the flow of current  
ii. by increasing the number of coil  
iii. by increasing the length and breadth of the coil

Which one of the following is correct?

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

28. What is the velocity of sound in the air at temperature  $20^\circ\text{C}$ ?

- (a)  $1450 \text{ ms}^{-1}$  (b)  $5130 \text{ ms}^{-1}$   
(c)  $344 \text{ ms}^{-1}$  (d)  $340 \text{ ms}^{-1}$

29. What will be the minimum distance between the source and the reflector to hear an echo?

- (a)  $17.5 \text{ m}$  (b)  $17 \text{ m}$   
(c)  $16.6 \text{ m}$  (d)  $16.3 \text{ m}$

30. Which particle of mass  $9.11 \times 10^{-31} \text{ kg}$ ?

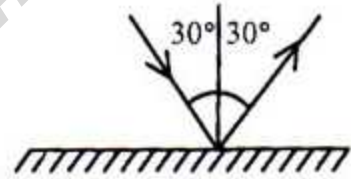
- (a) Alpha particle (b) Gamma particle  
(c) Beta particle (d) Radioactive ray

31. Which one of the following is the equation of magnification?

- (a)  $m = \frac{l'}{l}$  (b)  $m = \frac{l}{l'}$

- (c)  $l = ml'$  (d)  $f = \frac{r}{2}$

32.



The above figure obeys which law of light?

- (a) First law of reflection  
(b) Second law of reflection  
(c) First law of refraction  
(d) Second law of refraction

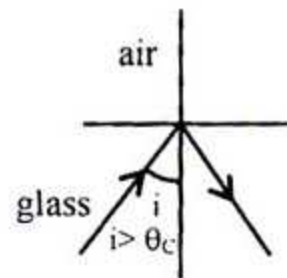
33. The refractive index of water with respect to air is 1.44. What is the refractive index of air with respect to water?

- (a) 0.75 (b) 0.69  
(c) 1.44 (d) 0.70

34. Which one is the relation between power  $p$  and focal length?

- (a)  $p = \frac{1}{f}$  (b)  $p \propto f$   
(c)  $f \propto \frac{1}{p}$  (d)  $p \propto \frac{1}{f^2}$

35.



Which one of the following is correct is light of above figure?

- (a) critical angle  
(b) Refracted angle  
(c) Reflected angle  
(d) Total internal refraction

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