

Jashore Board 2017

Physics

Subject Code

1	3	6
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Time — 2 hours 35 minutes

Creative Essay Type

Full marks — 50

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

1. ►

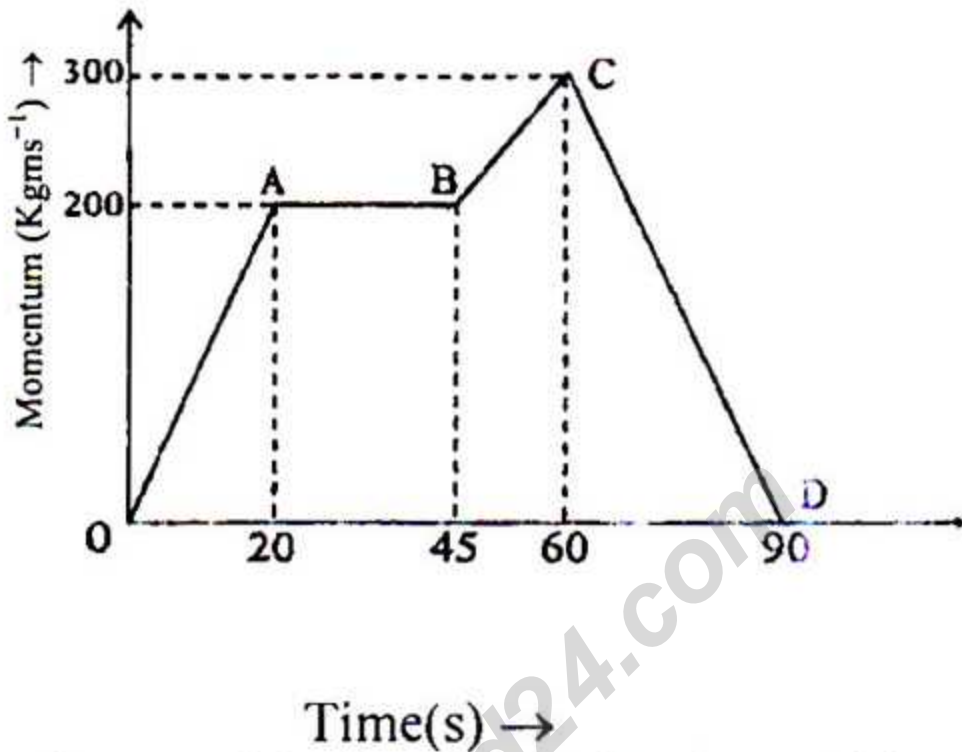
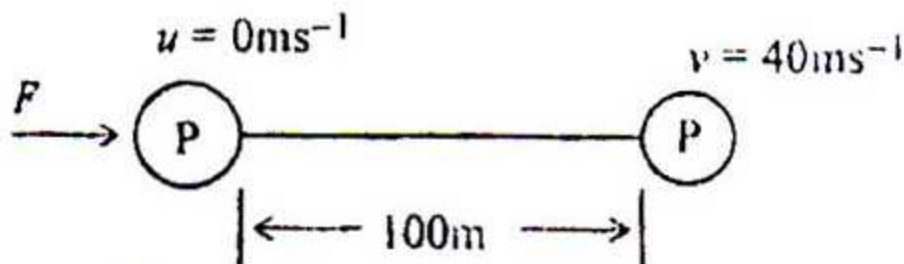


Fig: Momentum-time graph is given of a body of mass 10 kg.

- Write down the law of conservation of momentum. 1
- It seems the tree moving backward from a running bus — explain. 2
- Determine the distance traveled by the body in first 25 second. 3
- Compare with mathematical logic the active force on the body in OA, AB and CD part. 4

2. ★

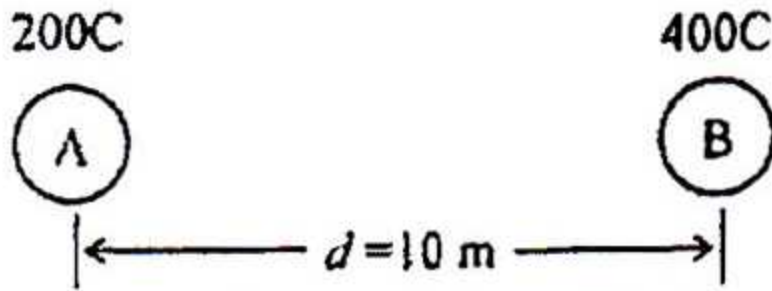


Mass of the body 'P' is 5 kg and frictional force is 10 N.

- Write the third law of freely falling bodies. 1
- The electric fan does not stop moving just after the switch turns off— Explain. 2
- Determine F. 3

- d. If the force is removed after passing 100m what total time from the beginning will the body take to stop? 4
3. ► A container is full of water and another container is full of kerosene oil. The height of the first container is 75 cm. The densities of water and kerosene oil are 1000 kgm^{-3} and 800 kgm^{-3} respectively. There is another body whose volume is 400 cm^3 .
- Write down the Hooke's law. 1
 - The lower part of an embankment is wider than the upper part– explain. 2
 - Determine the amount of pressure at the bottom of the first container. 3
 - If the given body is released in the first and then the second container, compare the buoyancy with mathematical logic. 4
4. ► There is 200ml water of temperature 75°C in a container of copper of mass 500g of temperature 23°C . As a result the final temperature becomes 65°C . The apparent expansion of water is 1.49ml. (There is no donation and reception of heat in any other way). The co-efficient of volume expansion of the material of copper is $50.1 \times 10^{-6} \text{ K}^{-1}$ and density of water is 1000 kg m^{-3} .
- What is called density? 1
 - If a body is immersed in water, it seems to have lost a part of its weight – Explain. 2
 - Determine the real expansion of water. 3
 - How much excess water is required to increase the final temperature further 5°C ? Explain with mathematical logic. 4
5. ► A body is placed on the principal axis at a distance 20cm of a lens of power + 2.5d.
- What is called radioactivity? 1
 - A normal eye can see an object of any distance – Explain. 2
 - Determine the distance of the image of the object. 3
 - Which defect can be rectified with the help of the given lens– explain with ray diagram. 4

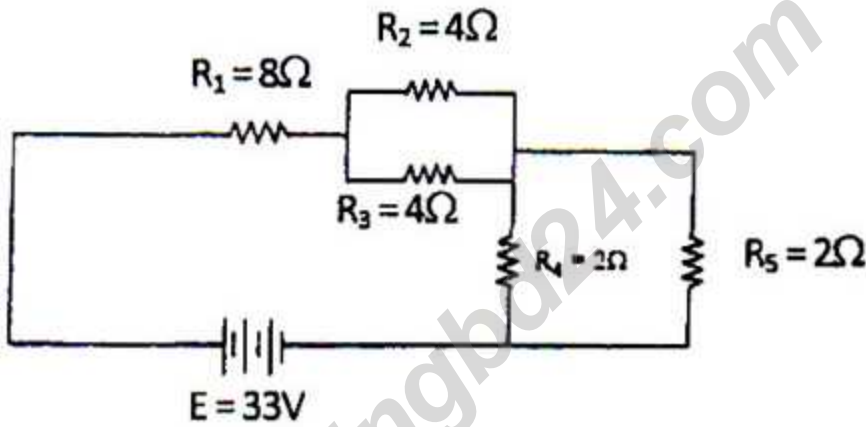
6. ★



200J and 300J work are done to bring $+5\text{C}$ charge from infinity to the electric field of A and B.

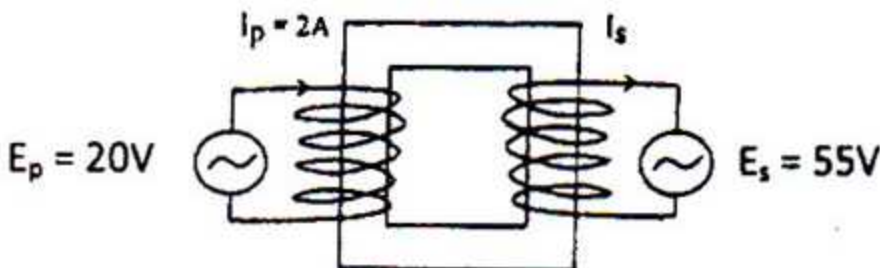
- Write down the Coulomb's law. 1
- Potential of a point charge will get decreased with the increase of distance in an electric field – Explain. 2
- Determine the force between A and B. 3
- If A and B are connected with a conducting wire determine the direction of flow of electron with mathematical logic. 4

7. ►



- What is called electric capacitor? 1
- Explain the change of resistance of a copper wire if it is elongated by pulling uniformly. 2
- Determine the equivalent resistance of the circuit. 3
- Which one of R_1 , R_2 and R_4 is of more power? Explain with mathematical logic. 4

8. ★



- What is called half-life? 1
- MRI is a painless and safe disease diagnosis method– Explain. 2
- Determine I_s . 3
- Explain the mechanism the transformer if DC is used instead of AC in E_p . 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. Which one is the dimension of luminous intensity?

- (a) I (b) J
(c) H (d) N

2. ★ Which of the following are vector quantities?

- (a) Work and displacement
(b) Energy and power
(c) Time and velocity
(d) Force and electric intensity

3. What m^3 is the volume of a sphere of radius $2m$?

- (a) $\frac{8}{3}\pi$ (b) 6π
(c) 8π (d) $\frac{32}{3}\pi$

Answer the questions no. 4 and 5 according to the following stem:

A bullet of mass $20g$ is shot from a gun of mass $5kg$ with a velocity $500ms^{-1}$ for $0.1s$.

4. What is the backward velocity of the gun in ms^{-1} ?

- (a) -0.5 (b) -2
(c) 0.5 (d) 2

5. In the incident —

- i. the impulse of force of the gun is $10Ns$
ii. The initial momentum of the gun = the final momentum of the bullet
iii. the action force of the gun on the bullet is $100N$

Which one is correct

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

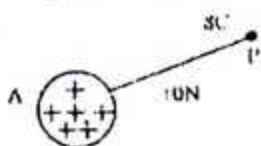
6. Thermometric property of matter is used in —

- i. wire of electric fuse
ii. filament of bulb
iii. alcoholic thermometer

Which one is correct

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

7.



What will be the magnitude of intensity at a point P if A charged body is connected with the earth?

- (a) $0NC^{-1}$ (b) $0.8NC^{-1}$
(c) $1.25NC^{-1}$ (d) $80NC^{-1}$

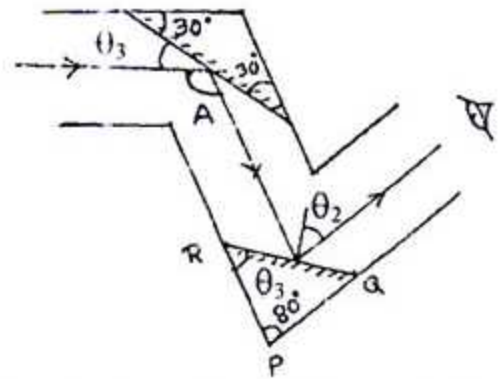
8. ★ The solid substances whose volumes contract on melting their melting point reduce with —

- (a) the increase of force
(b) the decrease of power
(c) the decrease of energy
(d) the increase of pressure

9. According to the real positive system all distances are to be measured starting from —

- (a) focal point
(b) optical centre
(c) curved surface
(d) centre of curvature

Answer the questions no. 10 and 11 according to the following stem:



10. What is the value of the angle A?

- (a) 30° (b) 60°
(c) 90° (d) 120°

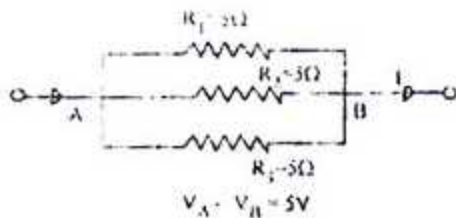
11. When the spectator will not be able to see the image through the periscope?

- (a) $\theta_1 = 40^\circ$ (b) $\theta_2 = 40^\circ$
(c) $\theta_3 = 30^\circ$ (d) $PQ = PR$

12. ★ Which of the following is colour sensitive?

- (a) Iris (b) Cornea
(c) Con Cell (d) Pupil

13.



In the above circuit —

- The value of I is 5A
- The power of circuit is 15W
- Equivalent resistance is $\frac{5}{3} \Omega$

Which one is correct

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

14. What are called the charges which accumulated in a conductor in electric induction process?

- (a) Inducing charge
(b) Induced charge
(c) Electric induction
(d) Free charge

15. Which one of the following is used to test stomach?

- (a) CT Scan (b) ECG
(c) Endoscopy (d) MRI

16. The temperature of a day is increased from 25°C to 30°C . What will be the increased temperature in Fahrenheit scale?

- (a) 5°F (b) 9°F
(c) 32°F (d) 41°F

17. Flow goes longitudinal wave propagate with the direction of frequency?

- (a) Perpendicularly (b) Parallel
(c) Transversely (d) Producing crest

18. Time period of a sound wave is $5.8 \times 10^{-4}\text{s}$ and velocity of sound is 320ms^{-1} . What is the wavelength of the sound wave?

- (a) 0.19m (b) 1.86m
(c) 18.56m (d) 55.17m

19. **★** On which does the resistance of a conductor depend?

- (a) Potential
(b) Electric current
(c) Electric intensity

(d) Cross sectional area

20. Inertia of which of the equal volume of the following is more?

- (a) Copper (b) Silver
(c) Mercury (d) Iron

Answer the questions no. 21 and 22 reading the following stem:

A carpenter is being made to enter a nail into a wood by a hammer.

21. What type of energy transformation takes place when the carpenter lifts the hammer up?

- (a) Heat energy \rightarrow Potential energy
(b) Chemical energy \rightarrow Potential energy
(c) Mechanical energy \rightarrow Potential energy
(d) Potential energy \rightarrow Mechanical energy

22. What type of energy transformation takes place when the hammer falls down?

- (a) Potential energy \rightarrow Kinetic energy \rightarrow Sound energy
(b) Chemical energy \rightarrow Sound energy \rightarrow Kinetic energy
(c) mechanical energy \rightarrow Kinetic energy \rightarrow Sound energy
(d) Potential energy \rightarrow Sound energy \rightarrow Heat energy

23. **★** Where image will be formed if the object is placed between principal focus and pole in a concave mirror?

- (a) In front of the mirror
(b) Behind the mirror
(c) At principal focus
(d) At pole

24. Which equation of the following is correct?

- (a) $G = \frac{gM}{R^2}$ (b) $2S = ut + vt$
(c) $h = \frac{u^2 - v^2}{2g}$ (d) $S = \frac{v + u}{2t}$

25. What valency mole is used as impurity to form p = type semi-conductor?

- (a) 3 (b) 4
(c) 5 (d) 7

Ans.	1	(b)	2	(d)	3	(d)	4	(d)	5	(d)	6	(d)	7	(a)	8	(d)	9	(b)	10	(d)	11	(a)	12	(c)	13	(c)
	14	(b)	15	(c)	16	(b)	17	(b)	18	(a)	19	(d)	20	(c)	21	(b)	22	(a)	23	(b)	24	(b)	25	(a)		