

Barishal Board 2016

Physics

Subject Code

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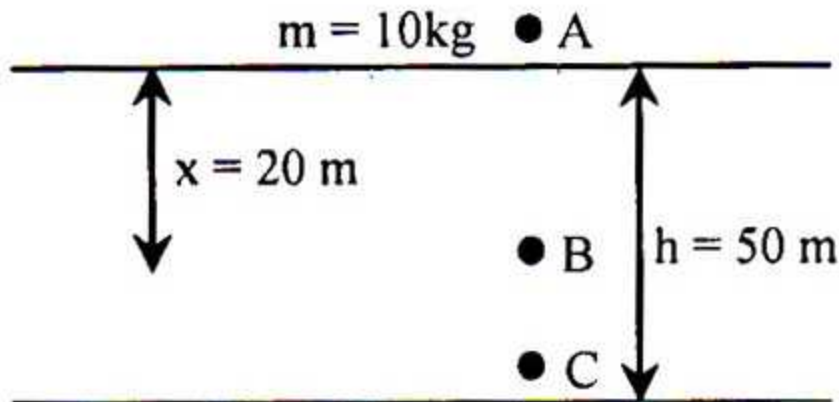
Time — 2 hours 10 minutes

Creative Essay Type

Full marks — 40

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

1. Observe the following figure:—

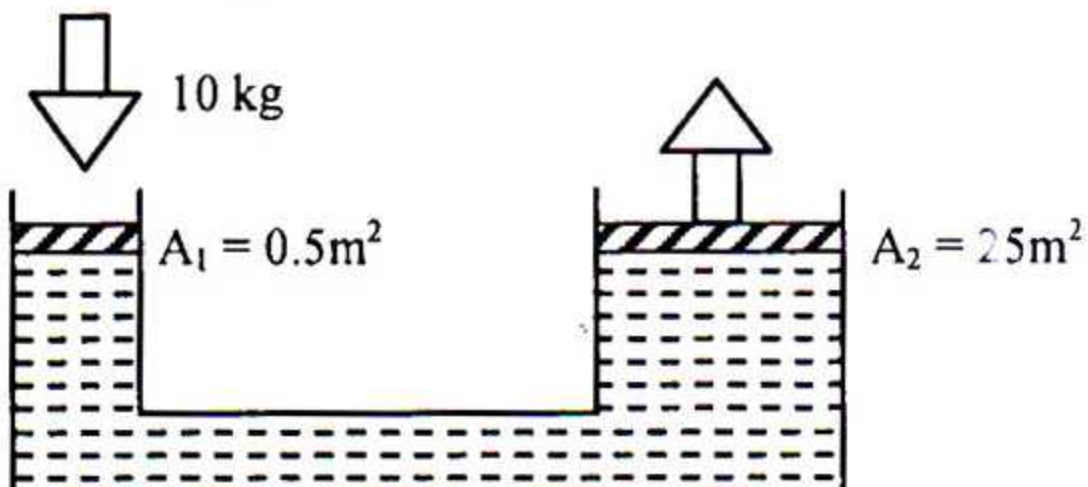


- What is weightlessness? 1
- Explain the relation between force and acceleration. 2
- Calculate the vertical height where the kinetic energy will be doubled of the potential energy of the object. 3
- With the help of the figure, show that total energy is conserved at the point A, B and C. 4

2. ★ A bullet of mass 10g shot from a gun with a velocity of 600ms^{-1} . In this time it exerts backward velocity of 2ms^{-1} .

- What is the least count? 1
- What do you mean by least count of screw gauge is 0.01mm? 2
- Determine the mass of the gun. 3
- How can you decrease the value of backward velocity of the gun? Explain probable ways with mathematical logic. 4

3. ▶ Observe the figure:—



- Write Archimedes Law. 1
 - Why a heavy weight is easy to lift in water? Explain. 2
 - If a mass of 10kg is exerted on small piston then what will be the upward force on large piston? 3
 - If a mass of 100 kg is exerted on large piston, is it possible to stop upward lifting? Explain mathematically. 4
4. ► The length of a copper wire is 100 m at 25°C. Due to increase of temperature its length became 100.02m. The co-efficient of linear expansion of the wire is $16.7 \times 10^{-6} \text{K}^{-1}$.
- What is the specific heat? 1
 - Why thermal expansion occurs due to increase of temperature? 2
 - What was the increase of temperature of that wire? 3
 - If the wire was made by Aluminum and if 875°C is needed to 100.02m length of the wire then could you determine the co-efficient of volume expansion of Aluminum? Explain mathematically. 4

5. ►

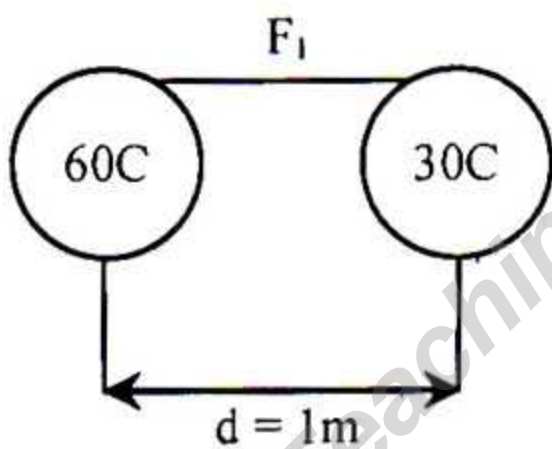


Figure-1

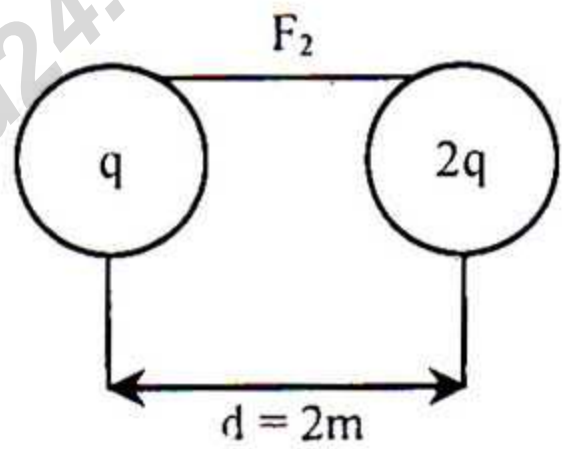


Figure-2

- What is silvering? 1
 - What do you mean by the value of linear magnification is 1.5? 2
 - Find the value of F_1 from figure-1. 3
 - If $F_2 = 4F_1$, then what will be the value of q ? 4
6. ★ The potential difference of electricity in Rakib's house is 220V. But they need 660V for their fridge. For this, he builds a transformer which contains 200 loop in its primary coil.
- What is electromagnetic induction? 1
 - How can we increase induced current? 2
 - Find the number of loop in secondary coil at Rakib's transformer? 3
 - Mathematically show that the current of the primary coil is 2-5 times of current of the secondary coil. 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 force?

- (a) MLT^{-1} (b) MLT^{-2}
 (c) $ML^{-2}T^{-2}$ (d) $M^{-1}LT^{-2}$

2. ★ Thermometric properties of matter is—

- i. volume
 ii. pressure
 iii. resistance

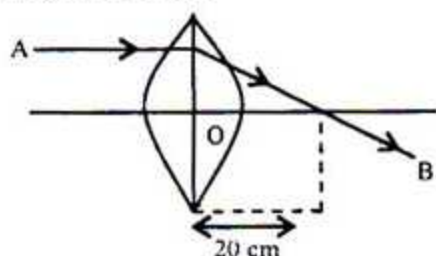
Which one is correct?

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

3. What is the full meaning of CT scan?

- (a) Computed Treatment scan
 (b) Computed Tomography scan
 (c) Computed Tomology scan
 (d) Commercial Tomography scan

According to the figure below, answer questions No. 4 and 5 :—



4. What is the power of lens?

- (a) + 0.2D (b) + 5D
 (c) - 5D (d) + 25D

5. If an object is situated from the lens the forming image is—

- i. real
 ii. virtual
 iii. magnified

Which one is correct?

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

6. Which one is not fundamental quantities?

- (a) Electricity
 (b) Luminous intensity
 (c) Luminous power
 (d) Temperature

7. In which cause the fuel energy is lost?

- (a) Friction
 (b) Force
 (c) Gravitational acceleration
 (d) Mass

8. ★ What is the weight of water of 1 cm^3 ?

- (a) 100 gm
 (b) 1 gm
 (c) 5 gm (d) 5 lbs

9. When pressure creates, the melting point of parafin becomes—

- (a) less
 (b) me
 (c) as the same
 (d) independent pressure

10. Which mirror used to see the damage of teeth?

- (a) Plane mirror (b) Spherical mirror
 (c) Convex mirror (d) Prism

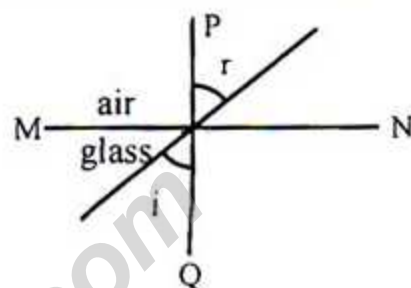
11. In which no free electron exists?

- (a) Conductor
 (b) Insulator
 (c) Semi-conductor
 (d) Good conductor

12. When a 50Ω conductor wire is cutting half, then what will be the resistance of each part?

- (a) 100Ω (b) 50Ω
 (c) 25Ω (d) 12.5Ω

According to the following figure, answer to the questions No. 13 and 14 :—



13. When $r = 60^\circ$, Which one is correct?

- (a) $i = 70^\circ$ (b) $i < r$
 (c) $i = \theta_c$ (d) $i = 60^\circ$

14. In which condition, the ray will come back in the media of glass?

- (a) $\theta_c < 90^\circ$ (b) $i > \theta_c$
 (c) $i = 90^\circ$ (d) $i > 90^\circ$

15. ★ Which one is correct?

- (a) $\gamma = 3\alpha$ and $\beta = 2\alpha$
 (b) $\gamma = 2\beta$ and $\beta = 2\alpha$
 (c) $\beta = \frac{\alpha}{2} = \frac{\gamma}{3}$
 (d) $\alpha = \frac{\gamma}{2} = \frac{\beta}{3}$

16. What will be the velocity of sound in 40°C temperature?

- (a) 332 ms^{-1} (b) 350 ms^{-1}
 (c) 356 ms^{-1} (d) 362 ms^{-1}

Going through the stem below answer to questions No. 17 and 18 :—

A man uses a lens as spectacles whose power is +2d.

17. What kind of lens it is?

- (a) Convex
 (b) Concave
 (c) Convex-spherical
 (d) Plane

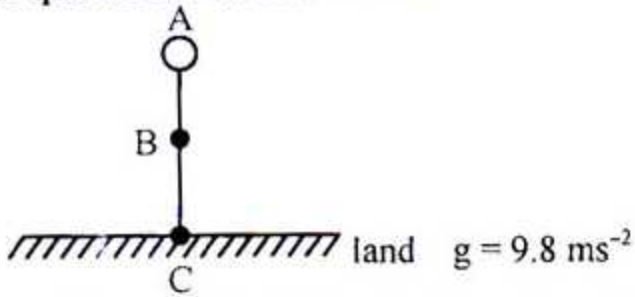
18. What is the focal length of the lens?

- (a) 1 m (b) 0.5 m
 (c) 0.25 m (d) 0.2 m

19. ★ What is the triple point of water?

- (a) 0.16°C (b) 273.00K
 (c) 273.16°C (d) 373.16K

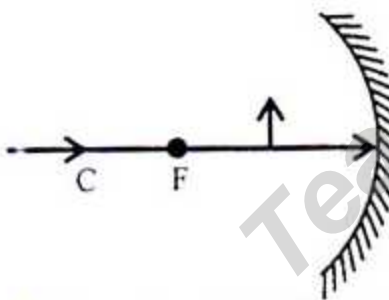
According to the picture below answer to the questions No. 20 and 21 :—



An object, weight 50kg, is allowed to drop down from the point A [AC = 100m and AB = $\frac{AC}{2}$]

20. What will be the maximum velocity of the object?
 (a) 100 ms^{-1} (b) 44.72 ms^{-1}
 (c) 44.27 ms^{-1} (d) 31.62 ms^{-1}
21. According to the above picture—
 i. the highest potential energy will be in point 'A'
 ii. potential energy and kinetic energy will be equal in point 'B'
 iii. potential energy of point A is 100 J
 Which one is correct?
 (a) i & ii (b) i & iii
 (c) ii & iii (d) i, ii & iii
22. Which one transformed sound energy into electric energy?
 (a) Microphone (b) Diode
 (c) Transistor (d) Speaker
23. Which one is the unit of pressure?
 (a) m^3 (b) kgm^{-3}
 (c) N (d) Pa

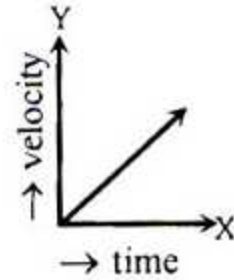
According to the picture below answer to questions No. 24 and 25 :—



24. In which cases the above mirror is used?
 (a) Hair cutting in Parlour
 (b) To see vehicles in back side
 (c) To treat teeth
 (d) To make telescope
25. In case of picture—
 i. real image
 ii. magnification > 1
 iii. the mirror is used to detect TV signal
 Which one is correct?
 (a) i & ii (b) i & iii
 (c) ii & iii (d) i, ii & iii
26. In which temperature, Centigrade and Fahrenheit scale will be the same reading?
 (a) 40°C (b) 40K
 (c) -40°C (d) -40K
27. ★ What is meant by the symbol ?
 (a) Resistance
 (b) Fixed resistor

- (c) Variable resistor
 (d) Fuse

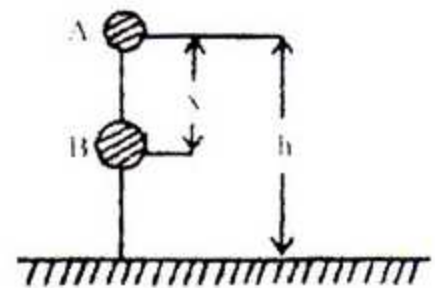
28. The velocity of sound is highest in which media?
 (a) Solid (b) Liquid
 (c) Gas (d) Plasma
29. In which substance, specific heat is the highest?
 (a) Lead (b) Iron
 (c) Copper (d) Ice
- 30.



According to the above picture, the object is going with—

- (a) Uniform acceleration
 (b) Non-uniform acceleration
 (c) Uniform velocity
 (d) Non-uniform velocity
31. A runner whose velocity is 7 ms^{-1} and mass 60 kg, then the kinetic energy is—
 (a) 100J (b) 1911J
 (c) 1875J (d) 1470J
32. In $n-p-n$ transistor, what is 'p' part?
 (a) Emitter (b) Collector
 (c) Base (d) Amplifier
33. ★ The power of lens is +2D, the focus length will be—
 (a) $\frac{1}{2} \text{ cm}$ (b) 2 cm
 (c) 4 m (d) $\frac{1}{2} \text{ m}$

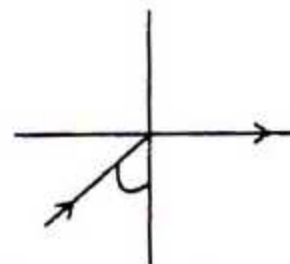
34.



In the point B, what will be the kinetic energy?

- (a) mgh (b) $mg(h-x)$
 (c) $2mgx$ (d) mgx

35.



In above figure refraction angle is—

- (a) 0° (b) 90°
 (c) 180° (d) 45°

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