

Cumilla Board 2017

Physics

Subject Code

1	3	6
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Time — 2 hours 35 minutes

Creative Essay Type

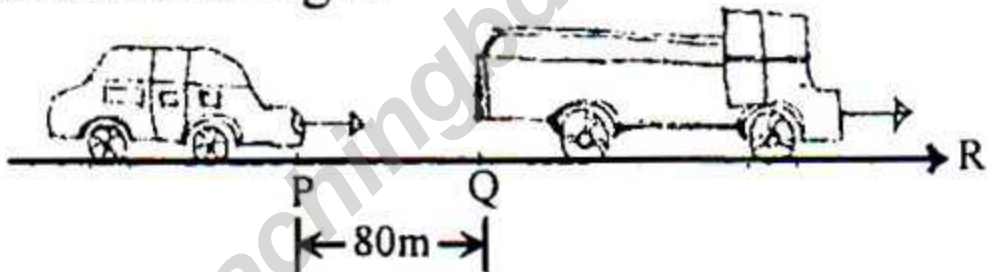
Full marks — 50

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

1. **★** The vernier constant of a slide caliper is 0.01 cm. Diameter of a sphere is measured using this slide caliper. Here the main scale reading is 12.2 cm, vernier coincidence is 5. There is no instrumental error in this slide caliper. The mass of the given sphere is 1 kg.

- a. What is called least count? 1
- b. Force is a derived quantity— Explain. 2
- c. Determine the radius of the given sphere. 3
- d. The sphere will whether sink or float in water – Explain with mathematical logic. 4

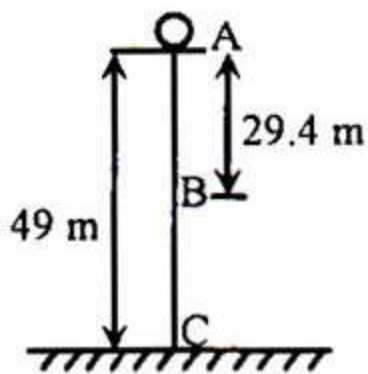
2. **▶**



A private car moves with a uniform velocity 21ms^{-1} from position P and a truck moves from rest with a uniform acceleration 2ms^{-2} from position Q in the same time and same direction.

- a. What is called pitch? 1
- b. Force is a derived quantity – Explain. 2
- c. Determine the distance travelled by the truck in 20th second. 3
- d. How many times will the private car and the truck meet together? Explain with mathematical logic. 4

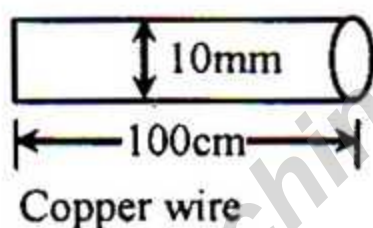
3. ►



A body of mass 100g is static at a point A. The body is released from that point.

- Write down the Newton's second law of motion. 1
- Why does a screw get stagnated with a wall when it is penetrated into the wall? Explain. 2
- Determine the maximum Kinetic Energy of the body. 3
- The total energy of the body at point A and B remains the same – Explain with mathematical logic. 4

4. ►



$$\begin{aligned}\gamma &= 50.1 \times 10^{-6} \text{ K}^{-1} \\ S &= 400 \text{ Jkg}^{-1} \text{ K}^{-1} \\ \rho &= 8960 \text{ kg m}^{-3}\end{aligned}$$

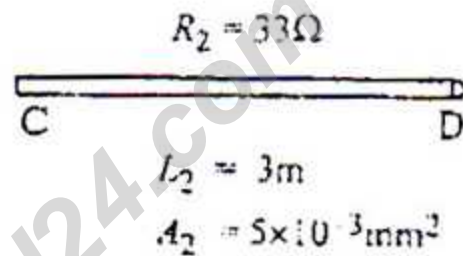
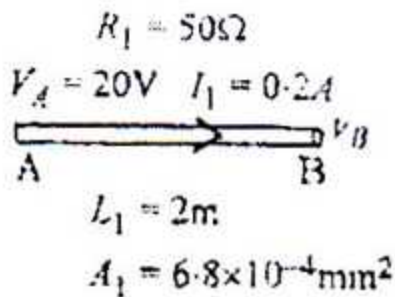
The temperature of the copper wire is increased by 150°C.

- What is called triple point of water? 1
- Pressure is a thermometric property of matter – Explain. 2
- Determine the required amount of heat applied on the copper wire. 3
- Will the copper wire be made to penetrate after applying heat through a ring of diameter 10.06 mm? Explain with mathematical logic. 4

5. ★ A person standing between two ten storied buildings shot a bullet from a gun. He heard the first echo after 2s and second echo after 2.15s. The temperature of air was 35°C at that time.

- What is called amplitude? 1
- The intensity of sound is 40 Wm^{-2} – What does it mean? 2

- c. Determine the distance between the buildings. 3
- d. At what time after hearing the second echo, he will hear the third echo? Explain with mathematical logic. 4
6. ► A body is placed on the principal axis at a distance 20 cm of a lens of power + 2.5d.
- a. What is called radioactivity? 1
- b. A normal eye can see an object of any distance – Explain. 2
- c. Determine the distance of the image of the object. 3
- d. Which defect can be rectified with the help of the given lens? Explain with ray diagram. 4
7. ►



- a. What is called electric field? 1
- b. If the distance between two point charge is halved what will be the change of coulomb force between them? – Explain. 2
- c. Determine V_B . 3
- d. The conductivity of the material of which wire is more? Explain with mathematical logic. 4

8. ★

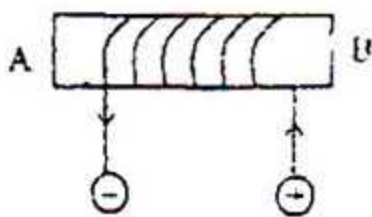


Fig-1

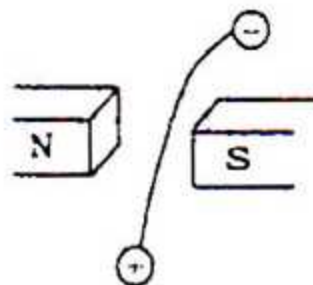


Fig-2

- a. What is angiography? 1
- b. How does a speaker work? Explain it. 2
- c. Which one is north-pole in fig 1? Explain. 3
- d. In which direction will the wire in fig 2 acquire resultant force? Explain it. 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.]

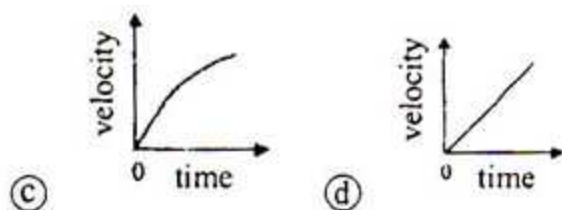
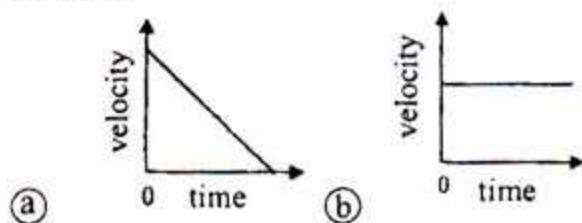
1. If light falls then a sensation of vision is created in the brain in which object?

- (a) Rods (b) Cones
(c) Eye lens (d) Retina

2. ★ Which supports the product of force and velocity from the following?

- (a) Impulse (b) Power
(c) Pressure (d) Energy

3. Which graph indicates the law of falling bodies?



4. How much volt is the potential of earth?

- (a) Zero (b) 440
(c) 33000 (d) Infinity

5. Partial blockage developed in the coronary arteries of heart is identified by which test?

- (a) Angiography (b) ETT
(c) ECG (d) CT Scan

6. The lines of force of cylindrical shaped coil wire is similar to —

- (a) U shape magnet
(b) ceramic magnet
(c) bar magnet
(d) horse leg shape magnet

7. Which relation is correct in calculation of electrical energy spent?

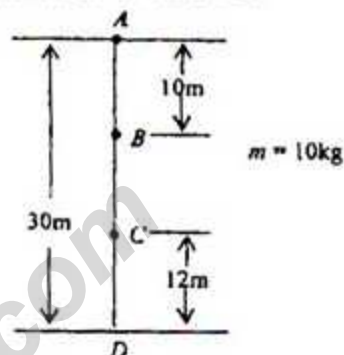
- (a) $W = I^2Rt$ (b) $W = IRt$
(c) $W = \frac{Vt}{R}$ (d) $W = \frac{Vt}{R^2}$

8. What is the refractive index of glass

when the critical angle of glass is 45° with respect to air?

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$
(c) 1 (d) $\frac{1}{2}$

On the basis of the following fig. answer questions number 9 and 10:



9. What is the potential energy at point A?

- (a) 2940J (b) 2900J
(c) 2840J (d) 2800J

10. ★ On the basis of the above fig. which is correct?

- (a) The potential energy at point C is more than at B.
(b) The kinetic energy at point C is more than at point B.
(c) The kinetic energy at point C is more than the potential energy at point B.
(d) The potential energy at point C is less than the kinetic energy at point B.

11. Which relation is correct in transformers?

- (a) $E_p I_p = E_s I_s$ (b) $E_s I_p = I_p I_s$
(c) $I_p n_p = I_s n_p$ (d) $E_p n_s = E_s n_p$

12. Which scientist invented the radioactivity of uranium?

- (a) Max Plank (b) Becquerel
(c) Albert Einstein (d) Neill Bohr's

13. At which altitude the value of 'g' is standard at sea level?

- (a) 30° (b) 45°
(c) 60° (d) 90°

14. Atmospheric pressure —
- it decreases as the height from the earth increases
 - the density of air is increased as it is decreased
 - as weight of air-column increases it increases

Which one of the following is correct?

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

15. On the body of an electric bulb 60W – 220V is written. What is the resistance of the bulb?

- (a) 16.36Ω (b) 160Ω
(c) 280Ω (d) 806.67Ω

16. ★ Which does play vital role for safe journey?

- (a) Mass (b) Weight
(c) Speed (d) Friction

17. Which one is software?

- (a) Processor (b) Monitor
(c) Printer (d) Windows 98

18. If medium a is denser with the respect of medium b then —

- ${}_a\eta_b < 1$
- ${}_a\eta_b > 1$
- ${}_b\eta_a > 1$

Which one of the following is correct?

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

19. What is the speed of sound at 10°C in normal pressure?

- (a) 332ms⁻¹ (b) 332.6ms⁻¹
(c) 338ms⁻¹ (d) 338.6ms⁻¹

20. In combined circuit —

- all points carry equal current in series connection
- at different point of the circuit flows different current in series connection
- in parallel connection the total current is equal to the sum of the currents at different points

Which one of the following is correct?

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

21. ★ What is the temperature at the triple point of water?

- (a) 0 K (b) $\frac{1}{273}$ K
(c) 273 K (d) 373 K

22. What is the relation between frequency and time period?

- (a) Proportional
(b) Inversely proportional
(c) Proportional of square
(d) Inversely proportional of square

23. To avoid the explosion of aeroplane —

- the wheels of aeroplane are made of conductor rubber
- as soon as the aeroplane ground at land the fuel loading will start
- a conductor is to be connected to the aeroplane and to the ground just before the fuel loading is started

Which one of the following is correct?

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

24. In electric field at 40C charge is placed it gained 160N. At that point if 50C charge is placed which force is gained?

- (a) 12.5N
(b) 128N
(c) 150N
(d) 200N

25. ★ Which one of the following is used in convex mirror?

- (a) Car
(b) Radar
(c) Torch light
(d) Solar oven

Ans.

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