Chattogram Board 2016

Physics

Subject Code | 1 | 3 | 6 |

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. ★ Sadek takes his motor cycle and with his friend Dipu with a view to visit their another friend. Their motor cycle starting from rest and in 10s it attains a velocity 72 kmh^{-1}. Then it travels 2 km with uniform velocity.

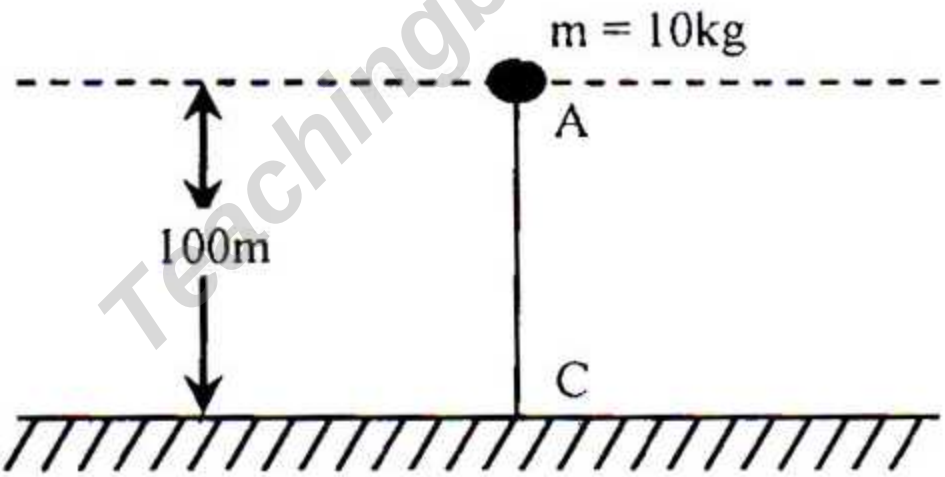
a. What is called displacement? 1

b. Write down two differences between velocity and speed. 2

c. Determine the acceleration of Sadek's motor cycle. 3

d. If Sadek travels whole distance with half acceleration instead of the mentioned acceleration, then he reached earlier at the destination—Analyse mathematically. 4

2. ▶



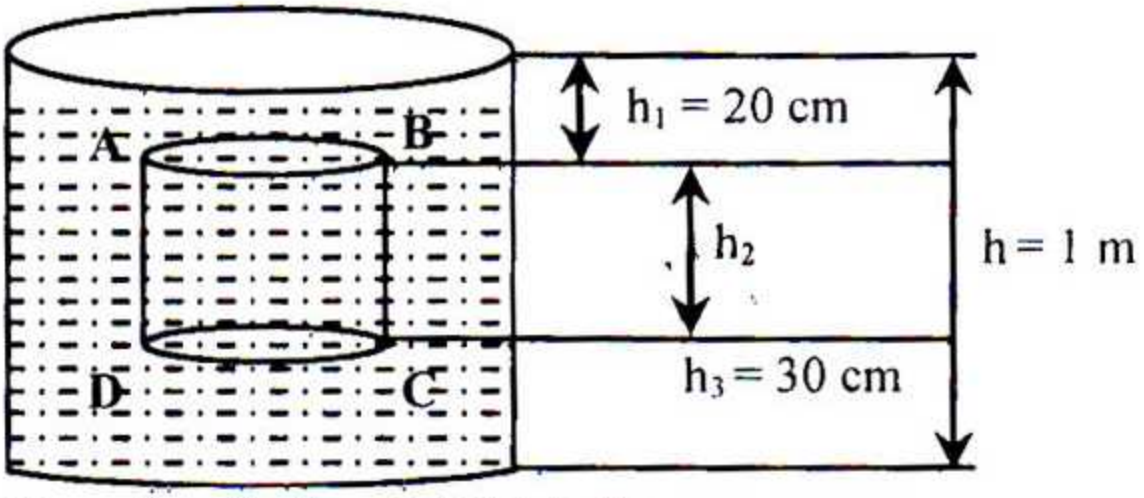
a. What is called work done? 1

b. What is meant by the work done against the force? 2

c. The object is allowed to fall freely from point A, then what is the velocity at point C? 3

d. What is the height from earth surface the potential energy is equal to the kinetic energy—Give your opinion with mathematical analysis. 4

3. ▶



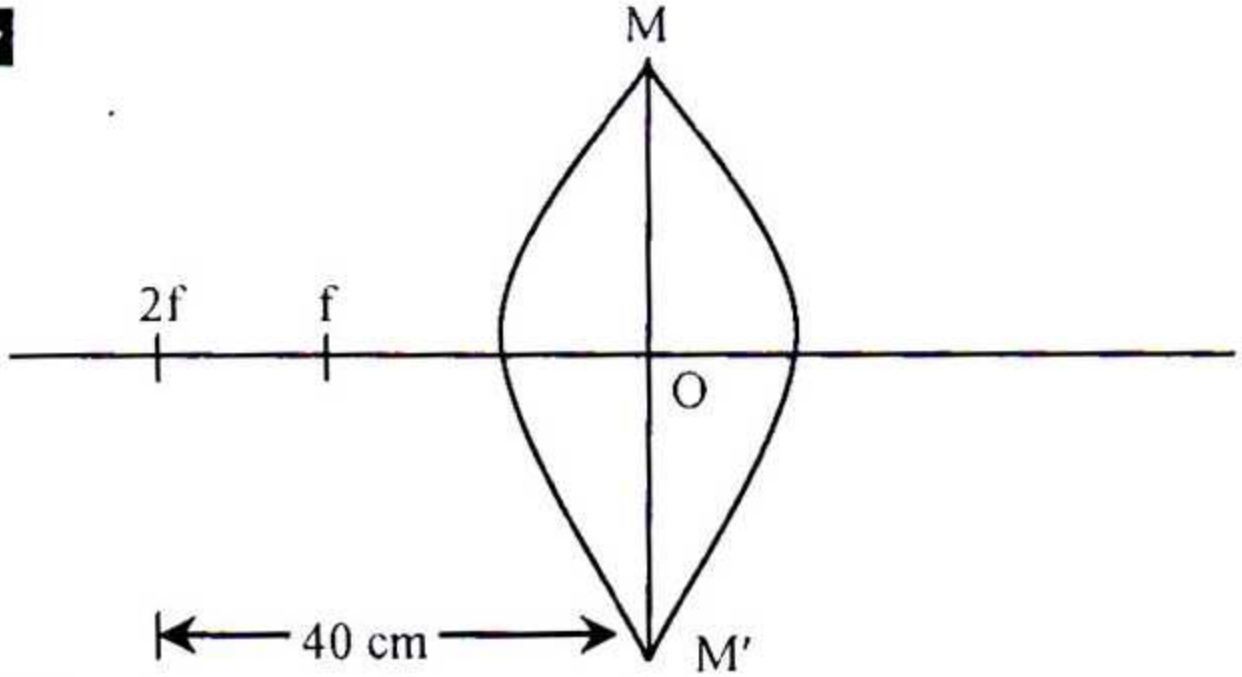
The radius of cylinder ABCD is 5cm.

a. What is called the apparent expansion of liquid? 1
b. Why we do not feel the atmospheric pressure? Explain it. 2
c. Determine the pressure of the liquid at point C in stem. 3
d. The weight of displaced liquid by the cylinder is equal to the upward resulting force acting on the cylinder. Prove this in light of the given information of above stem. 4

4. ▶ In a factory, 1, 2 and 3 Nos. level are attached on the three lead plate respectively. The surface area of every plate is $4m^2$. When No. 1 plate is heated to the temperature 175°C its surface area become $4.033m^2$. No. 2 and No. 3 plates are heated to the temperature up to 150°C and 170°C respectively [Room Temperature 25°C]

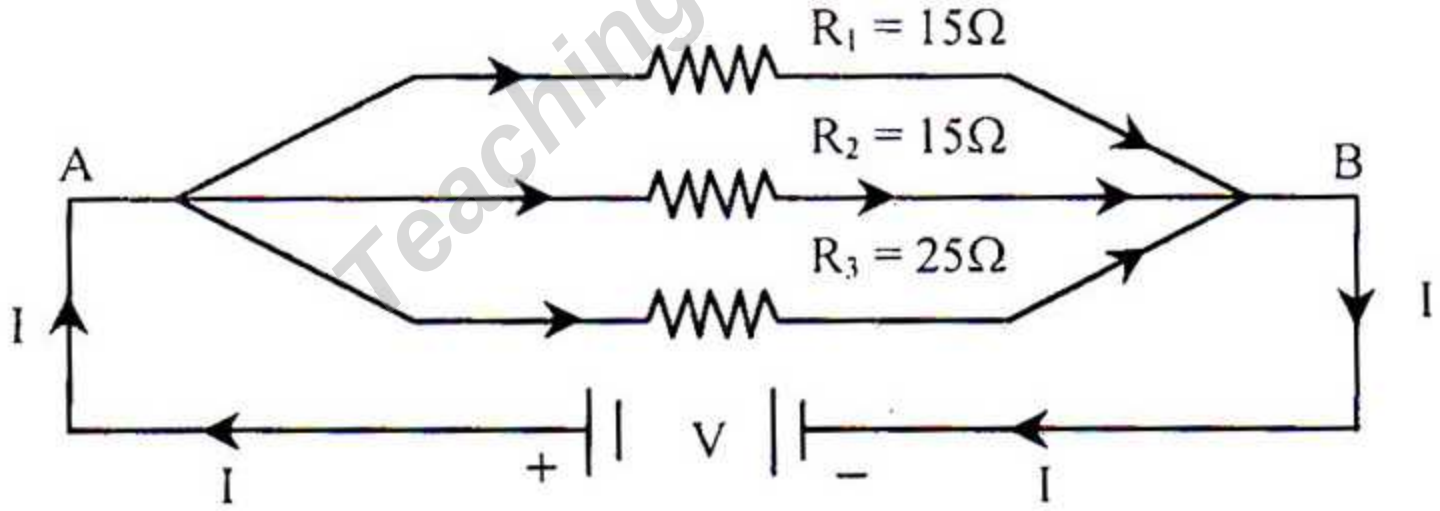
a. Define Evaporation. 1
b. If a big container and a small container have same height and to keep same amount of water in the two containers, then the evaporation of water will be occurred of which container faster and why? 2
c. Determine the value of the co-efficient of surface expansion of No. 1 plate. 3
d. The change of surface are of No. 2 and No. 3 plate is not equal due to application of heat — Analyse mathematically. 4

5. ★



a. What is centre of curvature? 1
b. Write down the use of optical fibre in case of medical science. 2
c. Determine the power of the lens. 3
d. The above lens is appropriate for what type of defect of vision to eliminate? Explain with ray diagram. 4

6. ▶



a. What is called specific resistance? 1
b. Explain Ohm's law. 2
c. If the R_1, R_2, R_3, resistances are connected series and parallel separately, then determine the equivalent resistance for both cases. 3
d. In parallel connection, the sum of the inverse of the resistances is equal to the inverse of the equivalent resistance— Give your opinion with logic. 4

Time — 35 minutes **Creative Multiple Choice Questions** Full marks — 35

[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. What is the unit of modulus of elasticity?
ⓐ Nm^2 ⓑ Nm
ⓒ Nm^{-1} ⓓ Nm^{-2}

2. Which one is the thermal property of a material?
ⓐ Density ⓑ Weight
ⓒ Pressure ⓓ Buoyancy

3. ★ Specific heat of silver is 230 $JK^{-1}K^{-1}$, if the mass of silver is 5 kg, then what is the amount of thermal capacity?
ⓐ 0.22 JK^{-1} ⓑ 46 JK^{-1}
ⓒ 235 JK^{-1} ⓓ 1150 JK^{-1}

4. A person stands 16.6m away from the reflector but cannot hear echo. Because—
i. temperature of air is less than 0°C
ii. velocity of sound was greater than 33ms^{-1}
iii. the sound came back within 0.1 sec
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

5. Characteristic of musical sound is—
ⓐ velocity of sound
ⓑ intensity of sound
ⓒ frequency of sound
ⓓ wavelength of sound

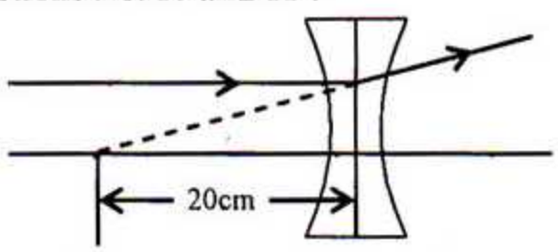
6. Which one is used to make simple periscope?
ⓐ Plane mirror ⓑ Concave mirror
ⓒ Convex lens ⓓ Concave lens

7. Which one is correct for plane mirror?
ⓐ Image is virtual and inverted
ⓑ Image is real and erect
ⓒ Image is virtual and diminished
ⓓ Image is virtual and magnification is one

8. ★ In an electric motor, how can the intensity of magnetic field be increased?
ⓐ By increasing the number of turn of the coil
ⓑ By decreasing the flow of current
ⓒ By decreasing the length and breadth of the coil
ⓓ By using the magnet of less power

9. Which one is painless and safe disease diagnosis method?
ⓐ MRI ⓑ Endoscopy
ⓒ CT Scan ⓓ X-ray

Based on the figure given below answer questions No. 10 and 11 :—



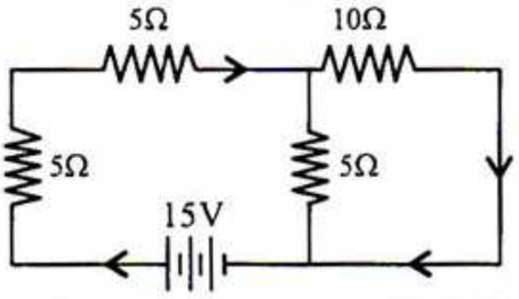
10. What is the power of the lens?
ⓐ –0.02D ⓑ +0.5D
ⓒ –5D ⓓ +5D

11. To see the object placed more than 50 cm away from a person who cannot see the distant object distinctly—
i. needs a lens which is in same type of the stem
ii. needs a lens of more power than that of given in the stem
iii. needs a lens of power – 2D
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

12. If the distance between two charged body and the amount of charge of each charged body is made doubled, then what will happen to the effective force?
ⓐ One-forth ⓑ Half
ⓒ Remains same ⓓ Doubled

13. Which instrument is used to determine the nature of a charged body?
ⓐ Ammeter ⓑ Galvanometer
ⓒ Voltmeter ⓓ Electroscope

Based on the figure given below answer questions No. 14 and 15 :—



14. What is the amount of equivalent resistance?
ⓐ 7.5Ω ⓑ 13.33Ω
ⓒ 17.5Ω ⓓ 25Ω

15. If from the circuit 10Ω resistance is removed then—
i. flow of current will be decreased
ii. equivalent resistance will be increased
iii. potential difference of the two ends of each resistance will be same
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

16. Which one is conducting material?
ⓐ Glass ⓑ Copper
ⓒ Wood ⓓ Rubber

17. ★ Resistance of copper will increase when—
i. temperature is increased
ii. length is increased
iii. cross sectional area is increased
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

18. Flow of current through primary and secondary coil is 10A and 2A respectively. If the voltage in primary coil is 200V, then what is the amount of voltage in secondary coil?
ⓐ 40V ⓑ 100V
ⓒ 400V ⓓ 1000V

19. Which one is the characteristic of gamma ray?
ⓐ Velocity is 10% greater than velocity of light
ⓑ Its a positively charged particle
ⓒ It has no mass
ⓓ It has greater ionization power

20. p-type semiconductor is made by adding—
ⓐ phosphorus with silicon
ⓑ boron with silicon
ⓒ antimony with germanium
ⓓ phosphorus with germanium

21. What is the function of a microphone when a singer sings holding it in hand?
ⓐ The sound is amplified
ⓑ The sound is transferred to electrical energy
ⓒ The intensity of sound is amplified
ⓓ Thick vocal chord is converted to thin vocal chord

22. Gamma ray emitted from Cobalt 60 is used in the diagnosis of which disease?
ⓐ Disease of thyroid gland
ⓑ To scan the brain
ⓒ To diagnose cancer
ⓓ To resolve anemia

23. For which purpose, doctor suggests to have angiogram?
ⓐ To detect the injured part of stomach
ⓑ To detect the cracks in bone
ⓒ For understanding kindey artery condition
ⓓ To detect gall bladder stone

24. In which place weight of a body is maximum?
ⓐ In equatorial region
ⓑ In polar region
ⓒ At sea level
ⓓ At the center of earth

25. Total number of division of Vernier scale in slide callipers is 20. The value of smallest division in main scale is 1mm. What is the Vernier constant?
ⓐ 0.01 mm ⓑ 0.05 mm
ⓒ 0.5 mm ⓓ 20 mm

26. ★ Two persons of mass 50 kg and 100 kg are moving with a velocity $4ms^{-1}$ and $2ms^{-1}$ respectively. Which one is correct for them?
ⓐ Kinetic energy of 1st person is two times than that of 2nd person
ⓑ Kinetic energy of 1st person is half of the kinetic energy of 2nd person
ⓒ Kinetic energy of 2nd person is 4 times than that of 1st person
ⓓ Both of them are having equal kinetic energy

27. Pressure of a liquid kept in a rectangular container is maximum at—
i. the top of the liquid
ii. the midpoint of the liquid
iii. bottom of the liquid
Which one is correct?
ⓐ i ⓑ ii
ⓒ iii ⓓ i, ii and iii

28. Which one is derived quantity?
ⓐ Flow of current ⓑ Heat
ⓒ Length ⓓ Intensity of light

29. What is the dimension of force?
ⓐ $ML^{-1}T^{-1}$ ⓑ MLT^{-2}
ⓒ $ML^{-1}T^{-2}$ ⓓ ML^2T^{-2}

30. ★ Which relation is correct? (in which normal symbols are used)
ⓐ $t \propto h^2$ ⓑ $G = g.R^2/M$
ⓒ $V = g + ut$ ⓓ $a = (v + u)/t$

31. Velocity of a car is $10ms^{-2}$ if it creates retardation $2ms^{-2}$, then what will be the velocity after 3s?
ⓐ $60\ ms^{-1}$ ⓑ $16\ ms^{-1}$
ⓒ $4\ ms^{-1}$ ⓓ $0.25\ ms^{-1}$

32. Newton's third law is applicable when—
i. we walk
ii. car moves in road
iii. leaning backward after the collision with the wall
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

33. ★ Which one measures the inertia of a body?
ⓐ Mass ⓑ Velocity
ⓒ Force ⓓ Momentum

Based on the passage given below answer questions No. **34** and **35** :—
Volume of a body of mass 500 gm is $64\ cm^3$. Density of water $1000\ kg/m^3$.

34. What is the weight of the body?
ⓐ 0.49N ⓑ 4.9N
ⓒ 49N ⓓ 4900N

35. If the body is released in water, then—
i. the body will sink
ii. buoyancy will be less than the weight of the body
iii. lost weight will be equal to the weight to the body
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

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