

Sylhet Board 2017

Physics

Subject Code 136

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. ► An object from rest travels the distance 50m in 5 seconds with uniform acceleration.
- What is called acceleration? 1
 - Why is the acceleration of an object moving uniformly zero? 2
 - What will be the velocity of the object after 15 seconds? 3
 - How long will the object take to travel the next 30m distance? Show it through mathematical analysis. 4
2. ★

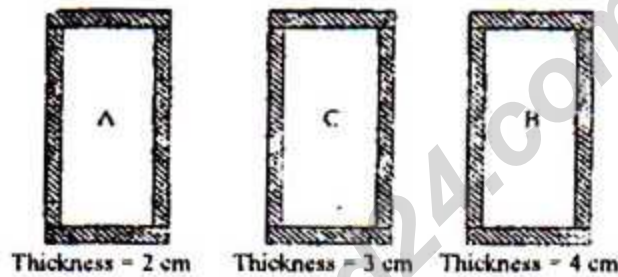
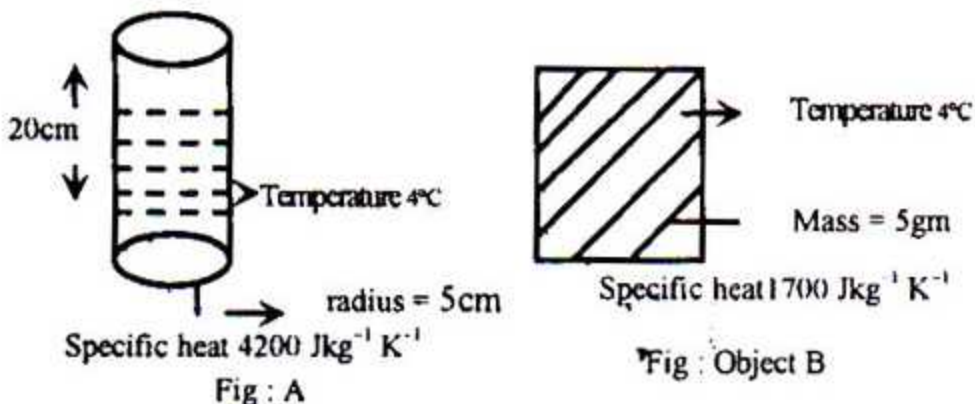


Fig: Three pieces of wood of different thickness: A, B, C
A bullet of mass 10 gm with a velocity 300ms^{-1} Penetrates one third of total thickness of three pieces of wood A, B, C and after this its velocity became half.

- What is called gravitational force? 1
- Why is frictional force produced? 2
- Find out the value of the opposing force. 3
- Can the bullet penetrate the rest of the thickness of woods afterward or not? Give your opinion through mathematical analysis. 4

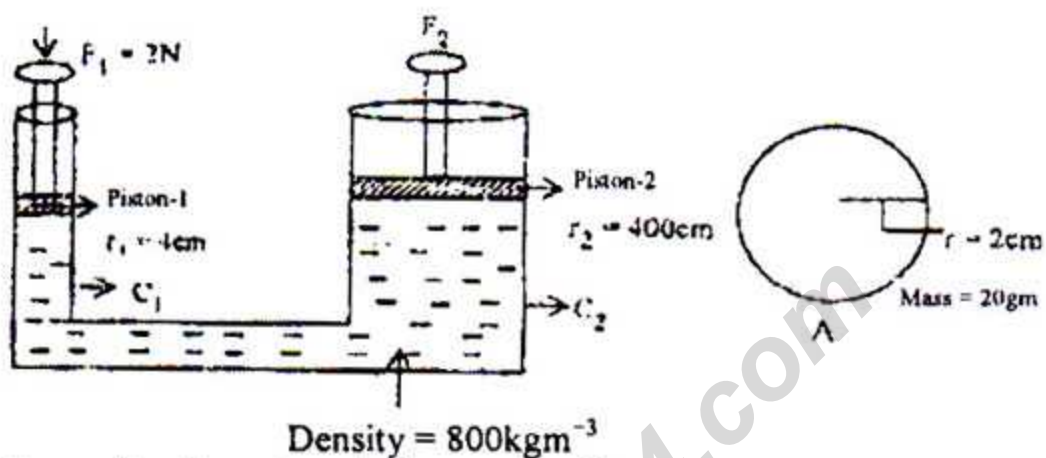
3. ►



- What is called 1 Kelvin? 1

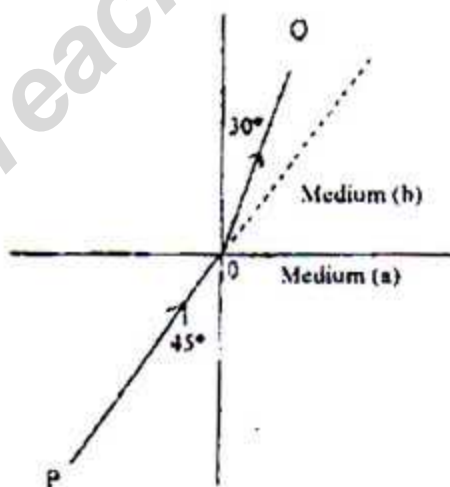
- b. Why is air of fan felt cold in sweating body? Explain. 2
- c. Find out the value of the temperature of the object B in Fahrenheit scale. 3
- d. What is the amount of heat needed to increase the temperature of only liquid of the container A and object B through 30°C separately? Which one needs more and how much? Analyse mathematically, (At 4°C , the mass of 1 c.c water is 1 gm) 4

4. ►



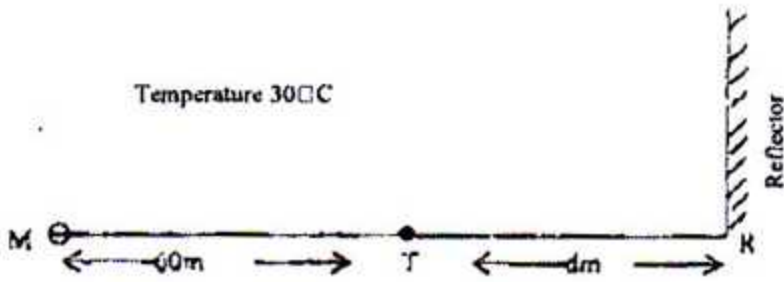
- a. What is called potential energy? 1
- b. What is Torricelli's vacuum? Explain. 2
- c. Find out the experienced force on the piston-2. 3
- d. If the object A is released in the liquid of the stem, will it float or immerse? Analyse mathematically. 4

5. ►



- a. What is refractive index? 1
- b. Why are two eyes having in human body advantageous? 2
- c. Find out the relative refractive index of medium (a). 3
- d. What will happen to the light ray if two media of the stem are interchange with each other and light ray PO is incident along the same direction? Give your opinion through mathematical analysis. 4

6. ★



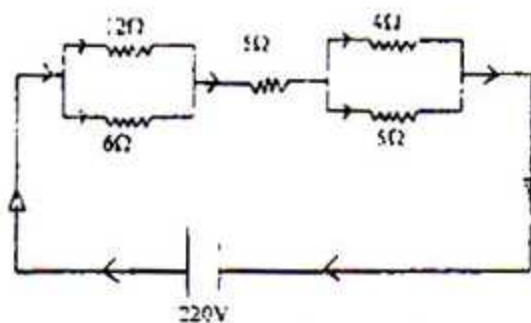
- What is echo? 1
- Why is the velocity of sound more during daytime than night? 2
- Find out the distance between the position M and reflector R. 3
- If sound is produced at position T, will echo be heard? If echo is heard, then after how long will echo be heard? Give your opinion through mathematical analysis. 4

7. ▶

Transformer		Number of Turns		Electric Current		Voltage
A	Primary	Secondary	Primary	Second	Primary	Secondary
A	30	300	6A	-	500V	-
B	60	30	-	-	500V	-

- What is called electric induction? 1
- What do you mean by combined circuit? Explain it. 2
- Find out the electric current in secondary coil of transformer A. 3
- Which one is convenient for dwelling house and for industrial uses by determining voltage difference in secondary coil of transformer A and B? Give your opinion. 4

8. ★



- What is called electromotive force? 1
- How are the area of cross section and resistance of conductor related? Explain. 2
- Determine the equivalent resistance of the above circuit. 3
- How are the resistances of the circuit of stem rearranged so that the flow of current will be 12.98A ? Draw the circuit by analysing mathematically. 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 substance has least specific resistance?

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

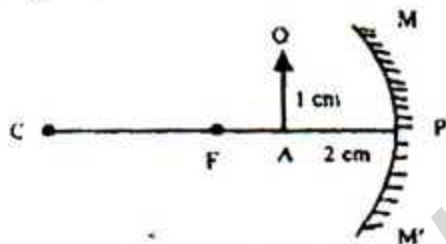
2. Vernier constant of a slide callipers is 0.005cm. What is the total number of division of vernier scale?

- (a) 5 (b) 10
(c) 15 (d) 20

3. ★ The potential difference between two ends of filament of a bulb is 12V and its resistance is 4Ω . What is the flow of current?

- (a) 3A (b) 4A
(c) 8A (d) 10A

Answer the questions no. 4 and 5 in the light of given figure:



4. What will be the nature of the image of the object OA?

- (a) Real and inverted
(b) Virtual and diminished
(c) Virtual and magnified
(d) Virtual and inverted

5. If the image of the object OA is formed at a distance twice of AP from mirror, what is the magnification of the image?

- (a) $\frac{1}{4}$ (b) $\frac{1}{2}$
(c) 1 (d) 2

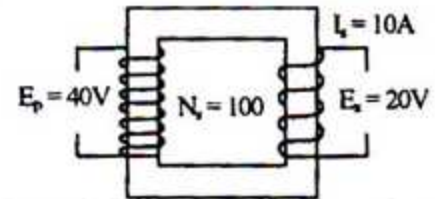
6. If the specific heat of copper is $400 \text{ JKg}^{-1} \text{ K}^{-1}$, what is the heat capacity of copper of mass 5 kg?

- (a) 400 JK^{-1} (b) 500 JK^{-1}
(c) 1000 JK^{-1} (d) 2000 JK^{-1}

7. The velocity of sound in air is 340 ms^{-1} and time to hear an each is 1.5s. What is the distance between source and reflector?

- (a) 250 m (b) 255 m
(c) 260 m (d) 265 m

8. ★



If the flow of current of secondary coil is made 3 times, what will be the change of the number of turns of primary coil?

- (a) Half (b) 2 times
(c) 3 times (d) 6 times

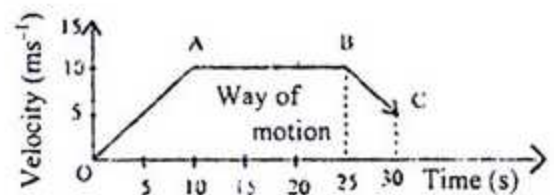
9. Who invented of vacuum tube first?

- (a) Addison
(b) Fleming
(c) Marconi
(d) De Forest

10. Which one is used in the treatment of blood-leucamia?

- (a) Co-60
(b) Iodine-131
(c) Technetium-99m
(d) Phosphorus-32

Answer the questions no. 11 and 12 according to given figure:



11. In which part of the graph is the car moving with uniform velocity?

- (a) OA (b) AB
(c) BC (d) AO and BC

12. If the mass of the car is 600 kg, then what will be the opposing force in the portion BC of the stem?

- (a) 0 N (b) 100 N
(c) 600 N (d) 1200 N

13. ★ Which one of the following is a special filtration machine?

- (a) Kidney (b) Heart
(c) Stomach (d) Liver

14. Who gave the concept of Solar-centered theory?

- (a) Romar
(b) Copernicus
(c) Trychobrahe
(d) Kepler

15. A boy of mass 50 kg runs with a velocity 7ms^{-1} . What is his kinetic energy?

- (a) 350 J (b) 490 J
(c) 1225 J (d) 3430 J

16. For a body moving with uniform acceleration starting from rest —

- i. velocity is proportional to time
ii. velocity is proportional to distance
iii. the distance travelled is proportional to the square of the time

Which one is correct?

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

17. Who gave the laws of falling bodies?

- (a) Dr. Gilbert (b) Galileo
(c) Newton (d) James Watt

18. The power of lens is +4D, it means —

- i. focal length be 25 cm
ii. the image of the object placed at a distance 2 cm away from the optical centre of the lens be virtual
iii. the lens is used as aid lens to remedy short sight

Which one is correct?

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

19. ★ Which one is the main fuel of thermal power station?

- (a) Coal (b) Mineral oil

- (c) Wind (d) Solar energy

20. Plasma —

- i. is the fourth state of matter
ii. particles carry electric charges
iii. particles have no definite shapes and volume

Which one is correct?

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

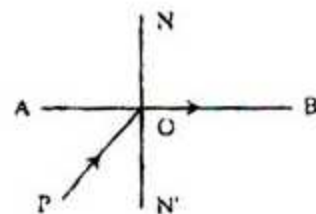
21. What is the co-efficient of volume expansion of copper?

- (a) $50.1 \times 10^{-6} \text{K}^{-1}$
(b) $33.4 \times 10^{-6} \text{K}^{-1}$
(c) $16.7 \times 10^{-6} \text{K}^{-1}$
(d) $13.7 \times 10^{-6} \text{K}^{-1}$

22. If the frequency of sound is increased in a definite medium, which one of the following will decrease?

- (a) Wave velocity (b) Amplitude
(c) Time period (d) Phase

23. Which one is the critical angle in the figure?



- (a) $\angle PON'$ (b) $\angle AOP$
(c) $\angle AON$ (d) $\angle BON$

24. What is the refractive index of optical fibre material?

- (a) 1.3 (b) 1.5
(c) 1.7 (d) 2.4

25. ★ Static electricity is used in —

- i. Spray gun
ii. Photocopier
iii. Ink Jet Printer

Which one is correct?

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

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