

Dhaka 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.]

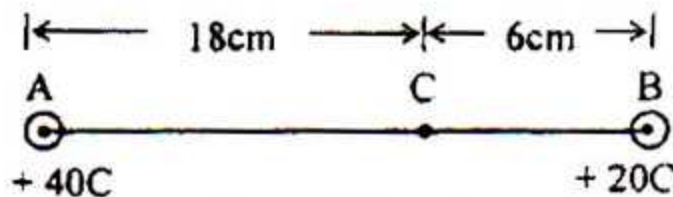
1. ► A deer of mass 80kg is running with uniform velocity 72kmh^{-1} . In the mean time a tiger of mass 200kg which was hiding behind a tree started chasing the deer from 75m behind with uniform acceleration 1.5ms^{-2} for 30s.

- a. What is inertia? 1
- b. What do you understand by 50N force? 2
- c. Find the kinetic energy of the tiger after 10s. 3
- d. Is it possible for the tiger to catch the deer? Give your opinion with mathematical analysis. 4

2. ★ The depth of a well is 3500cm, air temperature is 60°F . At this temperature the velocity of sound is 343ms^{-1} .

- a. What is wave velocity? 1
- b. Set the relationship between frequency and time period. 2
- c. What is the temperature of that place in celcius scale? 3
- d. If any sound is produced at the mouth of the well, will echo be heard? Explain mathematically. 4

3. ►



Charges A and B are placed in air medium.

- a. What is electric potential? 1
- b. 220V–60W is written in an electric bulb. Explain the meaning. 2
- c. Find out the amount of force acting between the charges A and B. 3

d. If a unit positive charge is placed at the point C, for which charge the intensity at C will be greater? Explain mathematically. 4

4. ► The weight of an object of area 20cm^2 and height 10cm in air and water is 9.8N and 7.84N respectively. Here $g = 9.8\text{ms}^{-2}$.

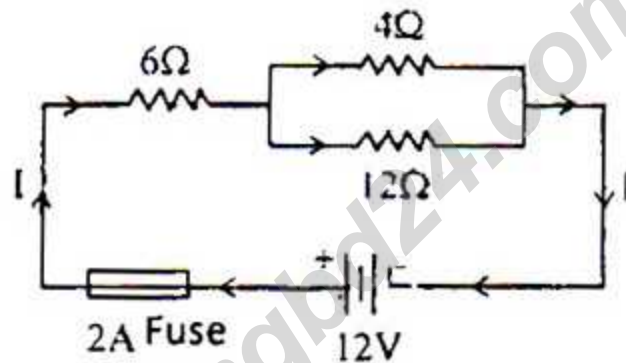
a. State Archimedes' law. 1

b. Write down the conditions of floatation and immersion of a body. 2

c. Calculate the density of the material of the object. 3

d. Does the stem follow Archimedes' law? Give mathematical explanation. 4

5. ►



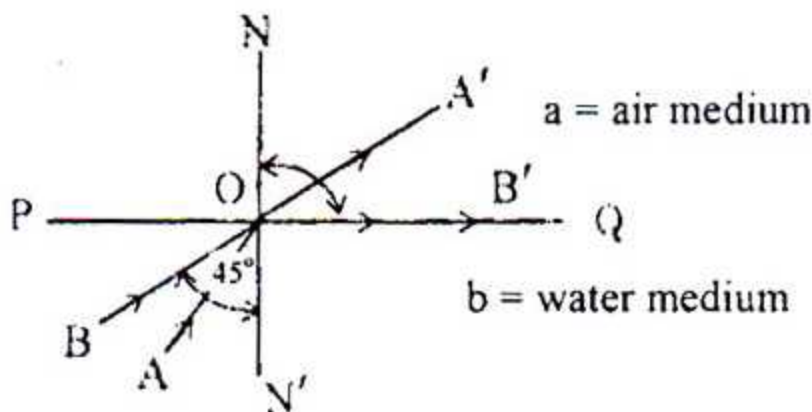
a. What is an electric circuit? 1

b. How can 'System Loss' be reduced? 2

c. Find out the equivalent resistance of the circuit. 3

d. If all the resistances in the stem are connected in parallel, will the fuse be burnt for the produced electricity? Analyze mathematically. 4

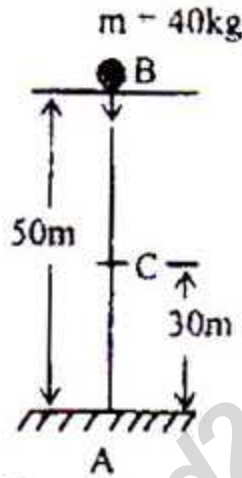
6. ★



Heare, $\angle BON' = 48^\circ$, $\angle B'ON = 90^\circ$ and $C_a = 3 \times 10^8\text{ms}^{-1}$.

- What is reflection of light? 1
- When total internal reflection will take place? Explain. 2
- Calculate the velocity of light in 'b' medium. 3
- If air medium in the stem is replaced with glass medium, is it possible to find total internal reflection? Analyze drawing required figure. 4

7. ►



- What is kinetic energy? 1
 - When we throw an arrow by stretching the string of a bow, how does the energy transformation take place? 2
 - Determine at which velocity the object will hit the ground? 3
 - If the object is dropped freely from the point B, the object follow the conservation of energy.– Explain mathematically. 4
8. ★ The ratio of the number of turns of the primary and secondary coil of a transformer is 1 : 50. The electric current and voltage of the primary coil is 5A and 220V respectively.
- What is solenoid? 1
 - Why motor is called the opposite instrument of generator? 2
 - Find $E_p : E_s$ according to the stem. 3
 - From the stem mathematically show that the electric power of the primary and secondary coil of the transformer remains constant. 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. From which Newton's Laws of motion force can be measured?

- (a) First law (b) Second law
(c) Third law (d) First and Third law

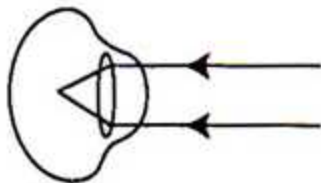
2. ★ Condition of total internal reflection is —

- i. Light rays pass from denser to rarer medium
ii. Incident angle > Critical angle
iii. Incident angle = Reflection angle

Which one is correct?

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

3.



What kind of defect of eye is indicated in the above figure?

- (a) Myopia (b) Nightblindness
(c) Retinal detachment
(d) Hypermetropia

4. If mass, specific heat and thermal capacity of a body are m , S and C respectively, then which of the following relation is correct?

- (a) $C = \frac{S}{m}$ (b) $S = \frac{m}{C}$
(c) $S = Cm$ (d) $S = \frac{C}{m}$

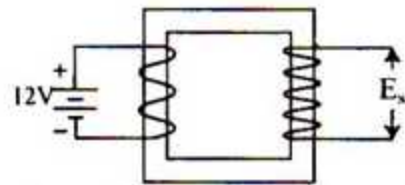
5. ★ Density of water is the highest at which of the following temperature?

- (a) 4 K (b) 273 K
(c) 277 K (d) 278 K

6. The length of a steel wire at 20°C is 100m. If the length of the wire at 50°C is 100.033m what is the co-efficient of linear expansion of steel?

- (a) $11 \times 10^{-6}\text{K}^{-1}$ (b) $22 \times 10^{-6}\text{K}^{-1}$
(c) $33 \times 10^{-6}\text{K}^{-1}$ (d) $44 \times 10^{-6}\text{K}^{-1}$

7.



In the above figure $n_p = 10$, $n_s = 50$.

What is the value of E_s ?

- (a) 0 volt (b) 12 volt
(c) 50 volt (d) 60 volt

8. Which of the following in an address of **rahim43@yahoo.com**?

- (a) Fax address (b) Internet address
(c) E-mail address (d) G-mail address

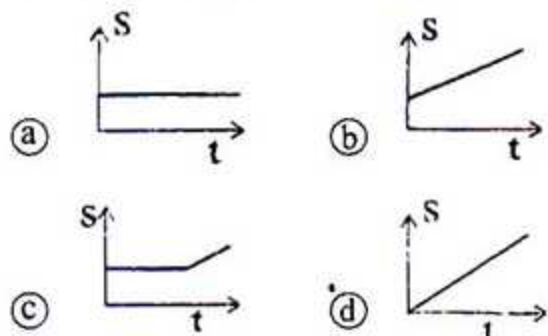
9. Which of the following two scientists invented that "nucleus is fissionable"?

- (a) Otto Henn and Stresemann
(b) Neill Bohr and Ernest Rutherford
(c) Pierre Curie and Madam Curie
(d) Max Planck and Albert Einstein

10. Which of the following is measured by spring balance?

- (a) Mass
(b) Acceleration due to gravity
(c) Force of gravity
(d) Force of friction

11. ★ Which of the following graphs indicates uniform velocity?



12. If constant force is applied on a body —

- i. When mass is less acceleration is greater
ii. When mass is less acceleration is also less
iii. When mass is greater then acceleration will be less

Which one is correct?

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

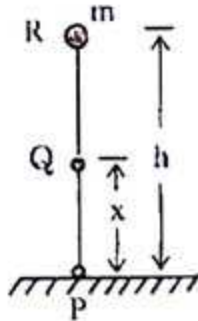
13. 54 kmh^{-1} equals to which of the following?

- (a) 12 ms^{-1} (b) 15 ms^{-1}
 (c) 20 ms^{-1} (d) 25 ms^{-1}

14. Mass of a body is 2 kg and initial velocity is 5 ms^{-1} . After 3 s velocity of body becomes 8 ms^{-1} , then what amount of force is applied on the body?

- (a) 1 N (b) 2 N
 (c) 3 N (d) 4 N

From the figure below, answer the question no. 15 and 16: —



15. What will be the Kinetic energy of the freely falling body at point Q if it falls from R?

- (a) 0 (b) mgx
 (c) mgh (d) $mg(h-x)$

16. In case of a free falling body from point R —

- i. The body will gain velocity
 ii. The Kinetic energy will be transformed into potential energy
 iii. Velocity will increase as distance increases

Which one is correct?

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

17. An electric motor lifts a body of mass 2 kg by 5 m and consumed 107 J of energy. What amount of energy is wasted by the motor?

- (a) 6 J (b) 9 J
 (c) 10 J (d) 49 J

18. NC^{-1} is the unit of which of the following?

- (a) Electric power
 (b) Intensity of sound
 (c) Pitch of sound

(d) Electric Intensity

19. What is the refractive index of the layer of optical fiber?

- (a) 1.50 (b) 1.55
 (c) 1.70 (d) 1.77

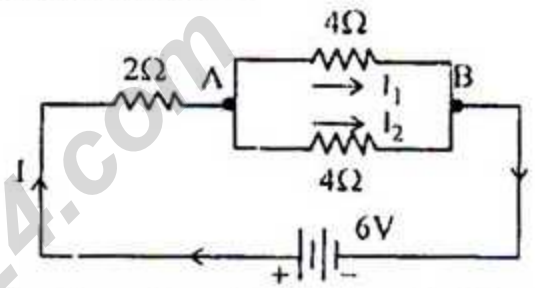
20. How many alphabets will not change when an image of the word "EXAMINATION" is seen in a plane mirror?

- (a) 5 (b) 7
 (c) 8 (d) 9

21. What is the dimension of energy?

- (a) MLT^{-2} (b) MLT^2
 (c) ML^{-2}T^2 (d) ML^2T^{-2}

Answer question no. 22 and 23 on the basis of the stem below: —



22. What is voltage between point A and B?

- (a) 2 V (b) 3 V
 (c) 4 V (d) 6 V

23. In case of current flowing in the circuit of above stem —

- i. $I = I_1 = I_2$ ii. $I_1 = I_2$
 iii. $I \geq I_2$

Which one is correct?

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

24. Melting point of which of the following matter increases as pressure increase?

- (a) Ice (b) Cast Iron
 (c) Wax (d) Antimony

25. Three dimensional images of different organs of human body can be generated by which of the following?

- (a) CT Scan (b) X-Ray
 (c) ECG (d) Angiography

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