

# Dhaka Board 2016

Physics

Subject Code 136

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. ★

Time (s)	0	8	16	24	32	40	48
Velocity ( $\text{ms}^{-1}$ )	0	4	8	8	8	4	0

The change of magnitude of velocity of different times for a moving car from rest is shown in the given chart.

- What is dimension? 1
- What do you mean by instantaneous speed? Explain. 2
- Calculate the distance travelled by the car within 1st 32s? 3
- According to given stem draw the graph and explain the nature of velocity for different parts. 4

2. ► A radio station broadcasts folk song in every morning 10 a.m. with frequency 350 kHz. Radio wave velocity is  $3 \times 10^8 \text{ ms}^{-1}$ . Wave length of another wave created in water is one percent of radio wave. Velocity of sound in water is  $1450 \text{ ms}^{-1}$ .

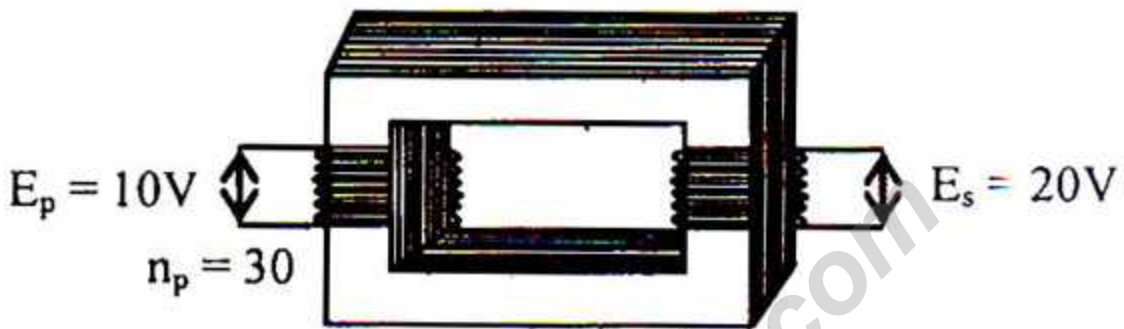
- What is frequency? 1
- Male voice is harsh but child and female voice is shrill. Explain. 2
- Calculate the wave length of radio wave. 3
- Frequency of radio wave, how many times of that of wave created in water? Analyze mathematically. 4

3. ► An engine of 1.5 H.P can fill up a tank of height 20m within 30 minutes. Capacity of the tank is 2,000 litre. Another

engine of 2 H.P can lift 3000 kg bricks at the same height within 25 minutes.

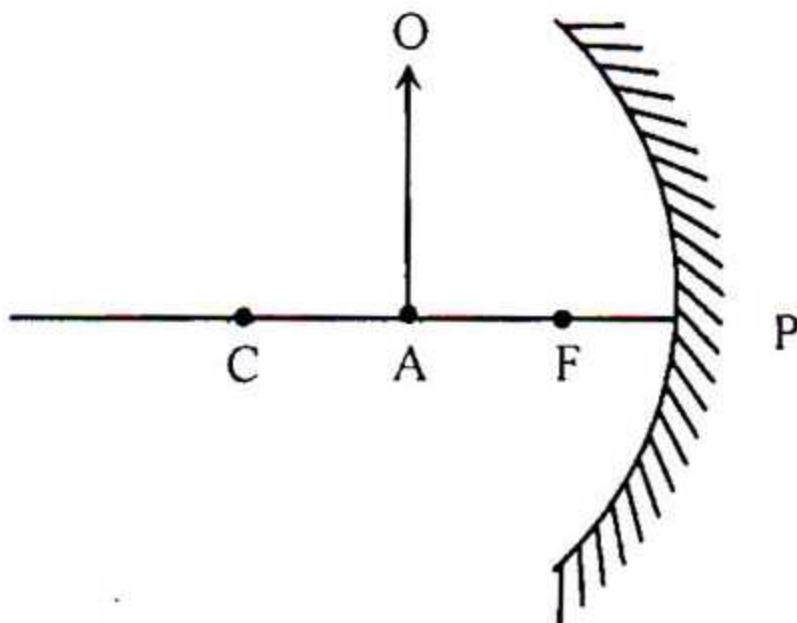
- a. What is stress? 1
- b. What do you mean by potential energy? Explain. 2
- c. Calculate the work done by 1st engine. 3
- d. Mathematically analyze the ratio of efficiency for both the engines. 4

4. ★ Answer the related questions according to given figure:



- a. What is solenoid? 1
- b. On the outer level of an engine is written '220V-1000W'. What does it mean? 2
- c. Calculate the ratio of current flow between primary and secondary coil of the given device. 3
- d. Analyze the importance of the given device to supply electric current. 4

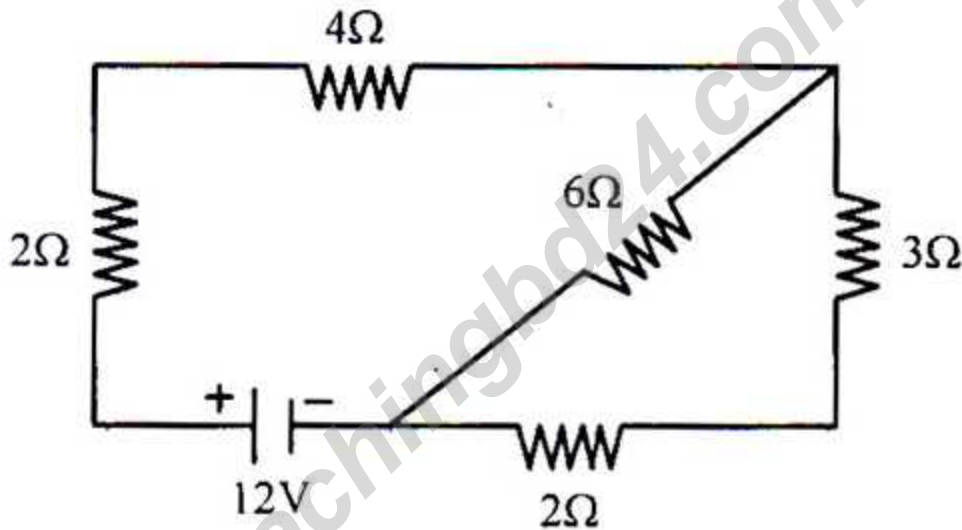
5. ► Answer the following questions according to given figure:





- a. What is lens? 1
- b. Explain why concave lens is known as diverging lens. 2
- c. What will be the position, nature and size of image for the given object? Explain with suitable ray diagram. 3
- d. Is it possible to get virtual image from the given mirror? Analyze with ray diagram. 4

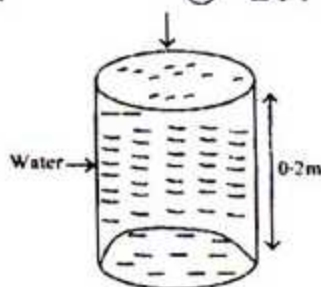
6. ► Answer the given questions according to figure:



- a. What is the full form of MRI? 1
- b. Explain why more current flows through the wider wire in compare to narrow wire. 2
- c. Calculate equivalent resistance of the given circuit. 3
- d. What amount of money is to pay as electric bill for one month if the given circuit run 6 hours per day? (Price per unit Tk. 5, 1 month = 30 Days). 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.]

- Who discovered calculus?  
 (a) Al Hazen (b) Newton  
 (c) Galileo (d) Kepler
- ★ How many basic colours in a colour TV?  
 (a) 3 (b) 4  
 (c) 5 (d) 7
- Which one is the unit of pressure?  
 (a) Newton (b) Joule  
 (c) Pascal (d) Watt
- Below which one follows total internal reflection?  
 (a) ECG (b) Endoscopy  
 (c) MRI (d) ETT



Now answer the question No. 5 and 6:—

- How much pressure in Pa will be felt at the bottom of the container?  
 (a) 49000 (b) 19600  
 (c) 9800 (d) 1960
- If 20N force is applied on the free surface of the container then this force—  
 i. will exert pressure everywhere in water uniformly  
 ii. will exert pressure in all directions of the container  
 iii. will exert pressure at the bottom of the container

Which one is correct?

- (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
- What is the value of Coloumb's constant in vacuum?  
 (a)  $9 \times 10^9 \text{ Nm}^{-2}\text{C}^{-2}$  (b)  $9 \times 10^9 \text{ Nm}^2\text{C}^{-2}$   
 (c)  $9 \times 10^9 \text{ Nm}^2\text{C}^{-1}$  (d)  $9 \times 10^9 \text{ Nm}^{-2}\text{C}^{-1}$
- ★ Which change occurs due to latent heat?  
 (a) Temperature (b) State  
 (c) Pressure (d) Heat
- Which one of the following is a fundamental quantity?  
 (a) Force (b) Displacement  
 (c) Velocity (d) Time
- Where convex mirrors are used?

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

- A body falls freely under the action of gravity, the changes of energy are—  
 i. the potential energy is decreased  
 ii. the kinetic energy is increased  
 iii. total energy is unchanged

Which one is correct?

- (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
- The length of an object and magnification of a convex mirror are respectively 0.5 and 0.2. What will be the length of the image in m?  
 (a) 0.1 (b) 0.4  
 (c) 0.7 (d) 2.5

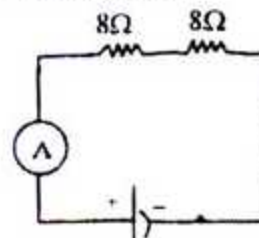
- Which one is vector?  
 (a) Energy (b) Momentum  
 (c) Time (d) Temperature

- Which is the unit of power of lens?  
 (a) Watt (b) Kilowatt Hour  
 (c) Diopire (d) Watt-Hour

- ★ A machine is able to lift 200kg of object vertically up to a height of 30m above the ground in 50s. What is the power of the machine?  
 (a) 0.12 KW (b) 1.2 KW  
 (c) 6.0 KW (d) 300 KW

Note: Correct answer is 2kw.

Observe the following figure and answer questions No. 16 and 17:



- The figure indicates—  
 i. current of resistances are same  
 ii. voltage of resistances are same  
 iii. equivalent resistance of the circuit is  $16\Omega$

Which one is correct?

- (a) i (b) ii  
 (c) iii (d) i, ii and iii
- What is the reading of the ammeter in A?  
 (a) 8 (b) 2  
 (c) 1 (d) 0.5

Note: If electromotive energy is 5V, the answer will be 0.3125



18. **★** In a solenoid, change the direction of electric current in opposite direction—  
 i. the poles are changed  
 ii. the direction of lines of forces will be opposite  
 iii. the iron rod lose its magnetism  
 Which one is correct?

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

19. What is the wavelength of X-ray in m?

- (a)  $10^{-8}$  (b)  $10^{-10}$   
 (c)  $10^{-12}$  (d)  $10^{-16}$

20. If the distance between the two charges are made double, then what will be the force between the two charges?

- (a) Double (b) Half  
 (c) One-third (d) One-fourth

21. A man uses a concave lens as a spectacles whose focal length is 20 cm. What is the power of lens in dioptré?

- (a) -5 (b) -0.5  
 (c) +0.5 (d) +5

22. Which machine works on the principle of electromagnetic induction?

- (a) Motor (b) Generator  
 (c) Transformer (d) Hair dryer

23. **★** If the reading of the linear scale is 4mm and NO. of division of the circular scale is 50, then what will be the diameter of the wire in mm? [Least count = 0.01]

- (a) 2.25 (b) 3.5 (c) 4.5 (d) 9.0

24. Which animal can hear infrasonic sound?

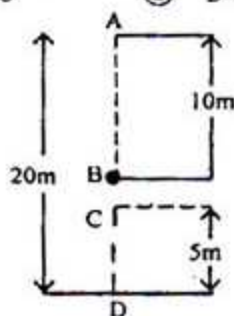
- (a) Bat (b) Elephant  
 (c) Bee (d) Man

25. Which one is constant force?

- (a) Weak nuclear force  
 (b) Gravitational force  
 (c) Magnetic force  
 (d) Friction force

26. At  $0^\circ\text{C}$  the length of a steel bar is 100 m, but at  $40^\circ\text{C}$  the length of the bar is 100.046 m. What is the value of co-efficient of linear expansion of steel in  $\text{K}^{-1}$ ?

- (a)  $11.5 \times 10^{-6}$  (b)  $11.0 \times 10^{-6}$   
 (c)  $23.0 \times 10^{-6}$  (d)  $34.5 \times 10^{-6}$



An object of 5kg is raised at the point of A from the ground. Answer questions No. 27 and 28 according to the figure:—

27. What is the potential energy of the object at the point of A?

- (a) 980 J (b) 98 J  
 (c) 9.8 J (d) 0.98 J

28. The figure reveals that—

- i.  $E_K - E_P = 0$  at point B  
 ii.  $E_P$  at point A =  $2 \times E_P$  at point C  
 iii. work done at part AC > work done at part CD

Which one is correct?

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

29. **★** What is the cause of shortsight?

- (a) Decrease of rod and concell  
 (b) Increase of radius of eye ball  
 (c) Increase of focal length of eye lens  
 (d) Decrease of power of convergence of eye lens

30. A motor cycle having velocity  $54 \text{ kmh}^{-1}$  is accelerated during time 5 seconds and final velocity rises up to  $35 \text{ ms}^{-1}$ . What was the acceleration in  $\text{ms}^{-2}$ ?

- (a) 5 (b) 4  
 (c) -4 (d) -5

31. Which wire is used in electric heater?

- (a) Copper (b) Nicrome  
 (c) Silver (d) Manganese

32. Digital signals is—

- i. audio and video voltage  
 ii. binary code  
 iii. particular value

Which one is correct?

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

33. 1 Pascal = ?

- (a)  $1 \text{ Nm}^{-2}$  (b)  $1 \text{ N}^{-1} \text{ m}^{-1}$   
 (c)  $1 \text{ Nm}^{-1}$  (d)  $1 \text{ Nm}$

34. Freely falling of all bodies—

- i. go down equal distance at equal time  
 ii. reach at the earth in various time  
 iii. distance travelled is directly proportional to 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

35. **★** Which one is the dimension of energy?

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

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