

# Rajshahi Board 2016

Physics

Subject Code 

1	3	6
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Time — 2 hours 10 minutes

Creative Essay Type

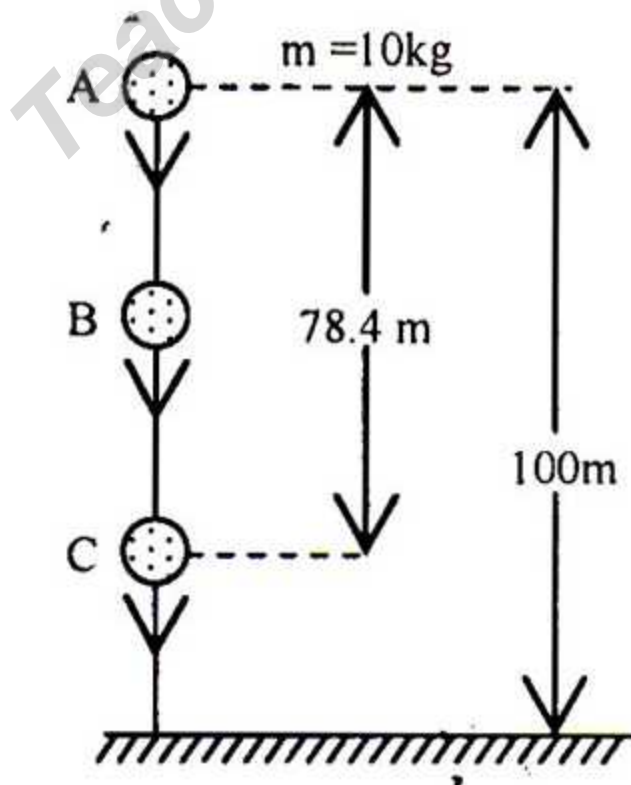
Full marks — 40

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

1. **★** Starting from rest, the velocity of a train, moving with uniform acceleration became  $30\text{ms}^{-1}$  after 1 minute. After that the train travelled 250m distance with uniform velocity, then the driver used brake and before going to rest the train passed 125m distance with uniform retardation.

- What is called displacement? 1
- Why is the motion of simple pendulum oscillatory? 2
- Find the acceleration of the train at 1st minute. 3
- Were the travelling time of the train with uniform velocity as well as uniform retardation same or different? Explain with mathematical logic. 4

2. ►



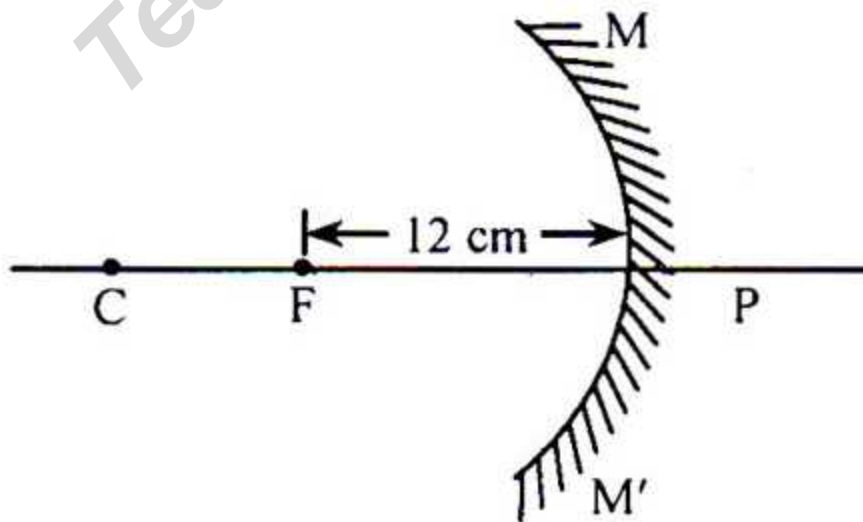
In Fig. The body is falling from 'A' towards ground.

- a. What is called efficiency? 1
- b. What factors does potential energy depend? Explain. 2
- c. How long time will the body take to reach at 'C' from 'A'? 3
- d. "The total energy of the body at point A and C are unchangeable" verify this statement mathematically. 4

3. **★** The frequency of Anika's vocal chord is 700 Hz. She calls a boatman who stays at the middle of river. Anika hears echo of her created sound due to the reflection from the other side of the river after 1.6 second. The velocity of sound of that time is  $350\text{ms}^{-1}$ .

- a. What is called phase? 1
- b. Why is the voice of women sharp whereas that of adult mean is deep? Explain. 2
- c. Calculate the wavelength of the sound created by Anika. 3
- d. Will the boatman hear the echo of the sound of Anika? Give your opinion with mathematical analysis. 4

4. ►

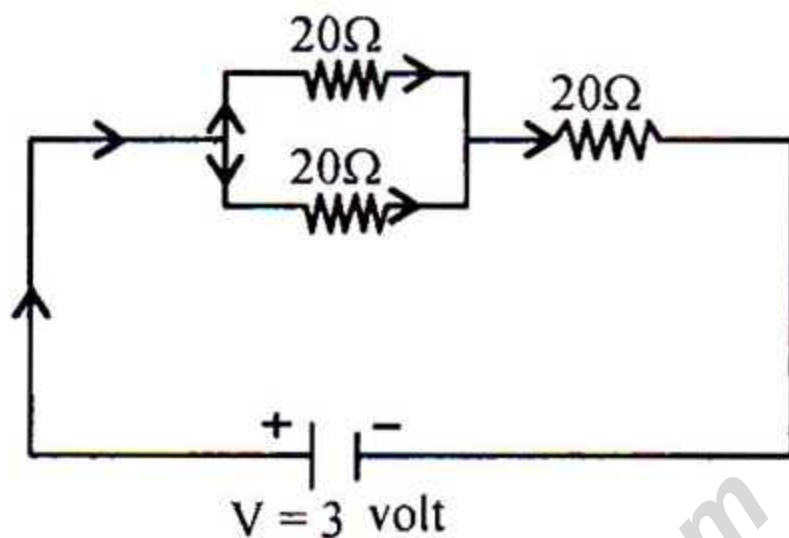


- a. What is called pole of a mirror? 1
- b. Why is concave mirror called converging mirror? Explain. 2
- c. Calculate the linear magnification if an object is placed at 24 cm apart from the mirror on its principal axis in figure. 3



- d. In figure, if two objects are placed at 10 cm and 15 cm in front of the mirror then explain the position and nature of their images with ray diagram. 4

5. ►



- a. What is called electromotive force? 1  
 b. What is meant by 10 coulomb charge? 2  
 c. Calculate the equivalent resistance of the circuit. 3  
 d. Explain with mathematical logic whether the electric current through all the resistances in the circuit are equal or not. 4

6. ★ The near points and far points of the defective eyes of two persons "A" and "B" are shown in the table below:—

Person	Near Point	Far Point
A	15 cm	100m
B	35 cm	Infinity

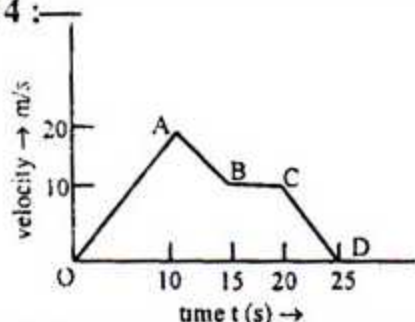
- a. What is optical centre? 1  
 b. Why is the use of optical fiber easier for the transmitting signal at far places? 2  
 c. Calculate the power of lens of the spectacles of the person "A". 3  
 d. Explain with ray diagram how the lens of the spectacles of the person "B" forms image. 4



[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.]

- What is called the ratio of stress and strain?  
 (a) Hooke's law (b) Surface tension  
 (c) Elasticity (d) Modulus of elasticity
- ★ What type of change in power is marked in transformer?  
 (a) Increase (b) Decrease  
 (c) Remain unchanged  
 (d) Decrease abnormally

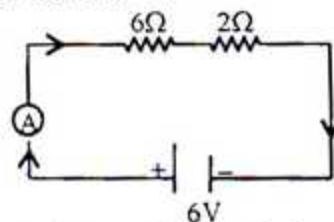
See the figure below and answer the questions no. 3 and 4 :



- Which line refers to zero acceleration?  
 (a) OA (b) AB (c) BC (d) CD
- Lines are referring to—  
 i. the acceleration of OA is  $2\text{ms}^{-2}$   
 ii. the acceleration of AB and CD are equal  
 iii. the distance of BC is 50m  
 Which one is correct?  
 (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
- What is called the small opening at the middle of the Iris?  
 (a) Eye-ball (b) Choroid  
 (c) Pupil (d) Cornea
- Which one of the following is renewable energy?  
 (a) Petrol (b) Gas (c) Coal (d) Water
- Jagadischandra Bose —  
 i. established 'Bose Science Mandir'  
 ii. composed 'Response in the Living and Non-Living'  
 iii. invented 'Crescograph'  
 Which one is correct?  
 (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
- A car of 1000 kg mass is moving with  $10\text{ms}^{-1}$  velocity. What is the kinetic energy in jule?  
 (a)  $5 \times 10^4$  (b)  $5 \times 10^3$   
 (c)  $5 \times 10^2$  (d)  $5 \times 10$
- ★ Which one of the following is correct?  
 (a)  $EF = q$  (b)  $F = qE$   
 (c)  $Fq = E$  (d)  $F_1Q = E$
- Dhaka radio station broadcasts programme in 630 KHz in medium wave. The velocity of radio wave is  $3 \times 10^8\text{ms}^{-1}$ . What is the wave length of it's?  
 (a) 476190 m (b) 476.19 m  
 (c) 476190 cm (d) 476.19 cm

- If the refractive index of water with respect to air is  $\frac{4}{3}$  then what will be the refractive index of air with respect to water?  
 (a) 1.55 (b) 1.33 (c) 0.75 (d) 0.666
- How many secondary axis are there in spherical mirror?  
 (a) 1 (b) 2  
 (c) 3 (d) infinity
- The amount of heat gained or lost by the body depends on—  
 i. mass of a body  
 ii. material of the body  
 iii. temperature of the body  
 Which one is correct?  
 (a) i and ii (b) i and iii  
 (c) ii and iii (d) i, ii and iii
- Which one is the correct for freely falling body?  
 (a) The potential energy is increased  
 (b) The kinetic energy is decreased  
 (c) Potential energy and kinetic energy are equal  
 (d) The kinetic energy is increased
- ★ Which ray is used to detect lung cancer?  
 (a) X-ray (b) Gamma ray  
 (c) Beta ray (d) Alpha ray

Observe the following circuit and answer the questions no. 16 and 17 —



- What is the reading of the ammeter in ampere?  
 (a) 4 (b) 3 (c) 1.33 (d) 0.75
- If all resistance are connected in parallel combination and then what will be the value of equivalent resistance?  
 (a) Larger than the largest resistance  
 (b) Smaller than the smallest resistance  
 (c) Equal to the largest resistance  
 (d) Equal to the smallest resistance
- Who is the inventor of the theory of relativity?  
 (a) Max Planck  
 (b) Albert Einstein  
 (c) Chandroshekhor Roman  
 (d) James Clerk Maxwell
- Which one is the dimension of momentum?  
 (a)  $ML\Gamma$  (b)  $ML^{-1}T$   
 (c)  $ML\Gamma^{-1}$  (d)  $ML^{-1}T^{-1}$



20. What type of sound is used to remove stone from teeth and kidney?

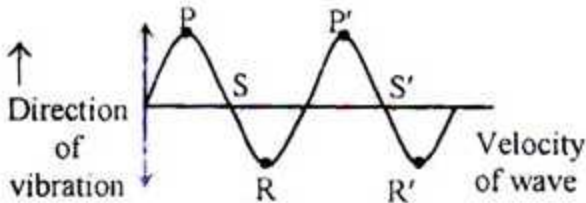
- (a) Mechanical sound
- (b) Audible sound
- (c) Ultrasonic sound
- (d) Infrasonic sound

21. What is used in electric motor to keep the coil rotating?

- (a) Commutator
- (b) Brush
- (c) Armature
- (d) Slip rings

22. When a rod is placed between the jaws of a slide calipers, the main scale reading is found 4 cm, vernier superimposition is 7 and the vernier constant is 0.1 mm. What is the length of the rod?

- (a) 4.7 cm
- (b) 4.07 cm
- (c) 4.7 mm
- (d) 4.07 mm



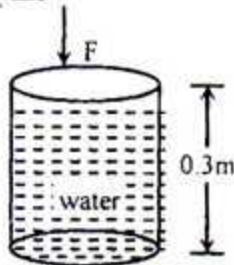
23. Which is the opposite phase in figure?

- (a) P and P'
- (b) S and S'
- (c) R and R'
- (d) P and R

24. Which one's resistivity is the most?

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

See the figure below and answer the questions no. 25 and 26 :-



25. How much pressure in Pascal will be felt at the bottom of the container?

- (a) 29.4
- (b) 30.61
- (c) 2940
- (d) 294000

26. If force F 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 direction of the container
- iii. will exert pressure at the bottom of the container only

Which one is correct?

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

27. What do you mean by alpha particle emitting from radioactive elements?

- (a) A helium nucleus

- (b) A hydrogen particle
- (c) A charge neutral particle
- (d) A negative charged particle

28. The heat which transforms a liquid into vapor state is called what?

- (a) Evaporation
- (b) Boiling
- (c) latent heat
- (d) latent heat of vaporization

29. Which is the correct formula of a rectangular body?

- (a)  $V = \frac{4}{3} \pi r^3$
- (b)  $V = \pi r^2 h$
- (c)  $V = \frac{1}{3} \pi r^2 h$
- (d)  $V = l \times b \times h$

30. What is called a silicon chip if million of circuit is added it?

- (a) Semiconductor diode
- (b) Electric capacitor
- (c) Integrated circuit
- (d) p - n - p junction

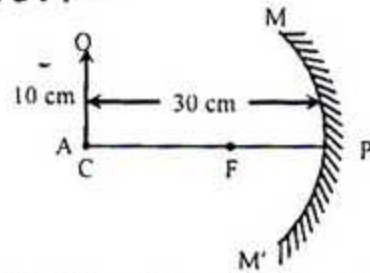
31. Which force can produce "zero resultant force"?

- (a) Unbalanced force
- (b) Non-contact force
- (c) Balanced force
- (d) Contact force

32. Which one is a part of mechanical energy?

- (a) Chemical energy
- (b) Kinetic energy
- (c) Electrical energy
- (d) Magnetic energy

Look at the figure and answer the questions no. 33 and 34 :-



33. What is the value of magnification of OA object?

- (a) 10
- (b) 5
- (c) 1
- (d) 0.1

34. What type of image will be placed OA object between F and C?

- (a) Virtual, upright and extended
- (b) Real, upside down and little in size
- (c) Real, upside down and little in size
- (d) Virtual, upright and little in size

35. What is called the process of charging an uncharged body bringing near a charged body?

- (a) Charged
- (b) Electric induction
- (c) Conduction
- (d) Friction

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