

Rajshahi 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. ►

Velocity (ms^{-1})	0	10	20	30	40	50	60
Time(s)	0	4	8	12	16	20	24

- What is called dimension? 1
- Explain why weight of a body varies at different places of the earth. 2
- Find out the distance travelled at 6th second in the light of information of the stem. 3
- Draw the graph in the light of given information and find out the slope of the graph. 4

2. ★ The weight of a body of a volume 400cm^3 in air is 19.6N . If it is immersed in water, its weight becomes 15.68N . At experimental place acceleration due to gravity $g = 9.8\text{ms}^{-2}$.

- What is called buoyancy? 1
- At definite depth the pressure depends on the nature of liquid.— Explain it. 2
- Find out the density of the body of the stem. 3
- Does the above stem support Archimedes' Principle? Give opinion through mathematical analysis. 4

3. ►

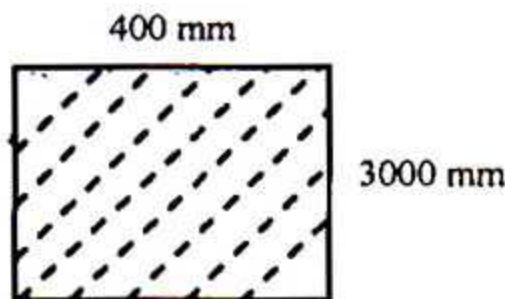
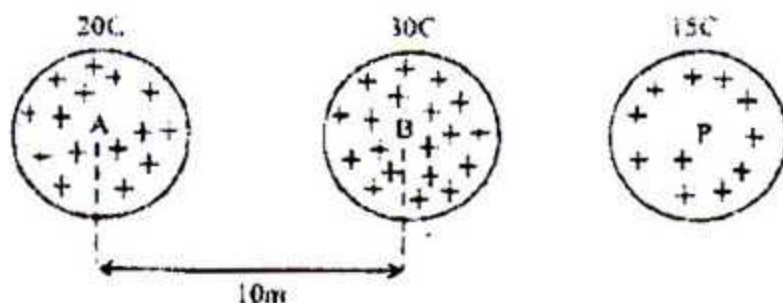


Figure : Metal piece

The surface area of the figure is increased by 0.1m^2 for the rise of temperature 30°C

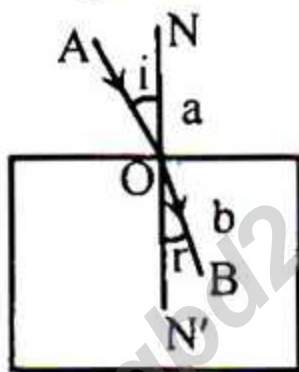
- What is regelation? 1
- Explain the plasma state of matter. 2
- Find out the co-efficient of linear expansion of the metal piece. 3
- What will be the increase in temperature to increase the surface area of that metal 6%? 4

4. ►



- What is called P–n junction? 1
- Explain how we can perceive the colour of coloured object. 2
- Find out the force between the charges A and B. 3
[Here constant $C = 9 \times 10^9 \text{Nm}^2\text{C}^{-2}$]
- At what position between the charges A and B is the charge P placed so that there is no effect of charges A and B on charge P? 4
Give your opinion through mathematical analysis.

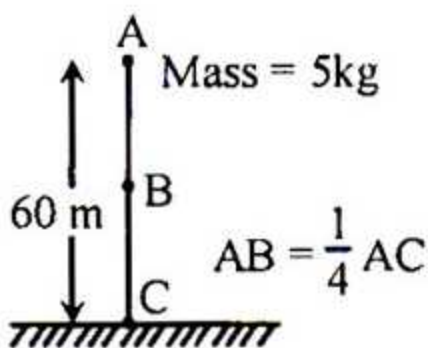
5. ★



The velocity of light decreased by one-third as light entered into the medium b from medium a. Velocity of light in medium a is $3 \times 10^8 \text{ms}^{-1}$.

- What is called refractive index? 1
- Explain the advantage of having two eyes. 2
- Find out the value of incident angle if the angle of refraction is 35° . 3
- If the angle of refraction is increased by 5° without changing the value of incident angle, what will be the change of the velocity of light in medium b? Give opinion with mathematical logic. 4

6. ★



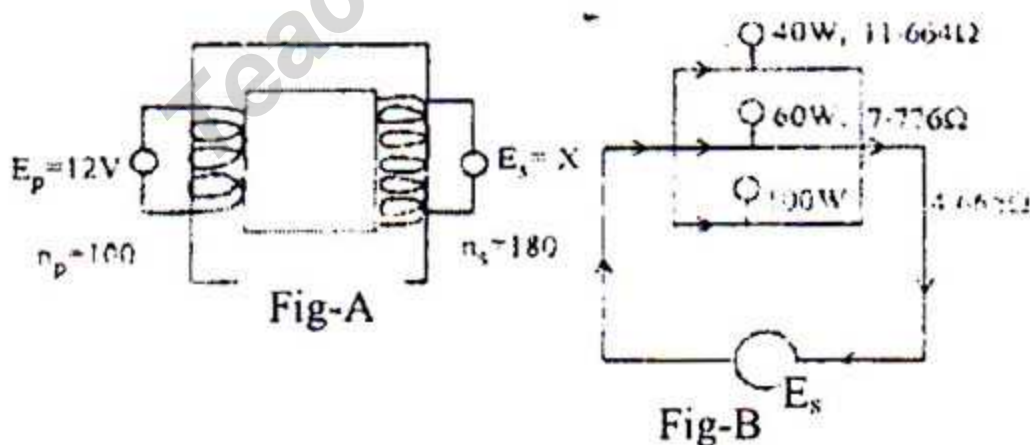
The body is dropped from the position A freely.

- What is called potential energy? 1
- Explain why biomass can be considered as a multiple source of energy. 2
- If the time to lift the body at position A from the ground be 2 minutes, what power is used? 3
- Does the law of conservation of energy follow at position B and C in above stem? Evaluate mathematically. 4

7. ► The frequencies of sounds produced from two different sources in medium P are 340Hz and 400 Hz and the difference of their wavelengths is 0.165 m. In another medium Q the velocity of sound is 400ms^{-1} .

- What is called contact force? 1
- Explain the relation between the velocity of sound with the nature of medium. 2
- Find out the velocity of sound in medium? 3
- If the difference of wavelength of same sound in both media is 0.1m, then will the wave travel the distance 124 m in medium Q by 80 complete vibrations? Give opinion through mathematical analysis. 4

8. ★



- Write elaboration of ECG. 1
- Why is electric current reduced for transmission of electricity over long distances? 2
- Find the value of X from figure : A. 3
- If all bulbs run at a time with the obtained value of X in figure : B, is it possible to get the maximum light? Give your opinion through mathematical analysis. 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 is the correct relationship?

- (a) $\alpha = 2\beta = \gamma$ (b) $2\alpha = \beta = \gamma$
 (c) $2\alpha = 3\beta = \gamma$ (d) $6\alpha = 3\beta = \gamma$

2. Which one of the following is a scalar quantity?

- (a) Force (b) Acceleration
 (c) Velocity (d) Work

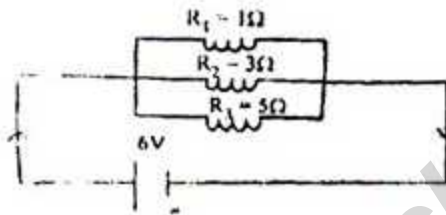
3. Small particles of ink of a inkjet printer are —

- i. positively charged
 ii. attracted by positive plate
 iii. moving through two plates

Which one is correct?

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

Observe the following circuit and answer the questions no. 4 and 5:



4. What is the value of electric current in A?

- (a) 0.67 (b) 3.9
 (c) 9.2 (d) 57.5

5. Which one of the following combination of the resistance the flow of current will be minimum? (9+ mean series combination and || mean parallel combination)

- (a) $R_1 + (R_2 \parallel R_3)$ (b) $R_2 + (R_1 \parallel R_3)$
 (c) $R_3 + (R_1 \parallel R_2)$ (d) $R_1 \parallel R_2 \parallel R_3$

6. What is the specific heat of water vapor in $\text{Jkg}^{-1}\text{K}^{-1}$?

- (a) 400 (b) 2000
 (c) 2100 (d) 4200

7. How much meter is equal to 10

fremtometer?

- (a) 10^{-12} (b) 10^{-13}
 (c) 10^{-14} (d) 10^{-15}

8. Which one is added with silicon in p-type semiconductor?

- (a) Boron (b) Phosphorus
 (c) Antimony (d) Arsenic

9. Inertia —

- i. is a natural phenomena
 ii. requires force to have a change
 iii. is determined by weight

Which one is correct?

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

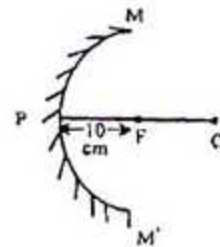
10. Which one is the dimension of power?

- (a) ML^2T^2 (b) MLT^{-1}
 (c) ML^2T^{-2} (d) ML^2T^{-3}

11. How can you find out the magnitude of charge?

- (a) Dividing force by electric intensity
 (b) Dividing electric intensity by force
 (c) Multiplying force by electric intensity
 (d) Multiplying electric intensity by the square root of force

12.



Which is the value of radius of curvature or mirror?

- (a) 20 m (b) 10 m
 (c) 20 cm (d) 10 cm

13. Which instrument is used to compare with a slice of bread to obtained image?

- (a) CT Scan (b) MRI
 (c) ECG (d) X-ray

14. If a runner of 60 kg passes 100m distance within 12.5 sec, how many kinetic energy in joule will be?

- (a) 240 (b) 480
(c) 1920 (d) 3840

15. **★** Intensity of magnetic field of a solenoid depends on —

- i. electric current
ii. the no. of turns of solenoid
iii. The direction of electric current

Which one is correct?

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

16. What type of image is produced in mirror in case of dental treatment?

- (a) Real and extended
(b) Virtual and extended
(c) Real and little in size
(d) Virtual and little in size

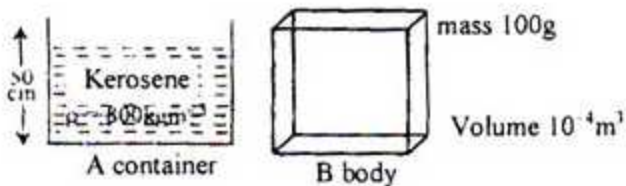
17. Which one is the colour sensitive?

- (a) Retina (b) Lens of eye
(c) Rods (d) Cones

18. What is the function of rectifier?

- (a) Increase the electric current
(b) Increase the voltage
(c) Decrease the electric current
(d) Turn one way the electric current

Answer the questions no. 19 and 20 on the basis of the following stem:



19. How much pressure in Pascal will be felt at the bottom of the container 'A'?

- (a) 3.92×10^6 (b) 3.92×10^4
(c) 3.92×10^3 (d) 3.92×10^{-4}

20. **★** What will happen if 'B' body is kept in 'A' container?

- (a) will sink down
(b) will partially immersed
(c) will float
(d) will float freely just below the surface

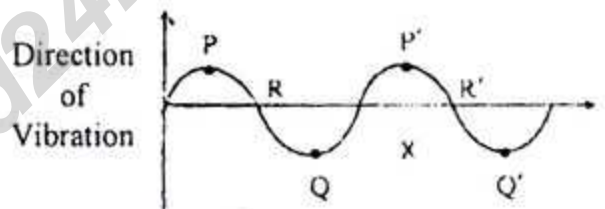
21. **★** Who is the inventor of the wind pump?

- (a) Romer
(b) Von Guericke
(c) Huygen
(d) Robert Hooke

22. What type of friction is the motion of bicycle?

- (a) Static friction
(b) Sliding friction
(c) Rolling friction
(d) Fluid friction

23.



Which one indicates wave length?

- (a) PR (b) PQ
(c) P'Q' (d) PP'

24. What is called the rectangular coil of wire on the soft sheet of iron in generator?

- (a) Slip ring (b) Armature
(c) Solenoid (d) commutator

25. **★** The velocity of a car decreases at a uniform rate from 20 ms^{-1} to 4 ms^{-1} in 4 sec.

What is the acceleration of the car in ms^{-2} ?

- (a) 16 (b) 4
(c) -4 (d) -16

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