SSLC MODEL EXAMINATION, MARCH - 2022

PHYSICS

(English)

Time : 1½ Hours | Total Score : 40

General Instructions to Candidates :

- There is a 'Cool-off time' of **15** minutes in addition to the writing time. Use this time to get familiar with questions and to plan your answers.
- Questions with different scores are given as distinct parts.
- Read the instructions carefully before answering the questions.
- Keep in mind, the score and time while answering the questions.
- The maximum score for questions from **1** to **24** will be **40**.

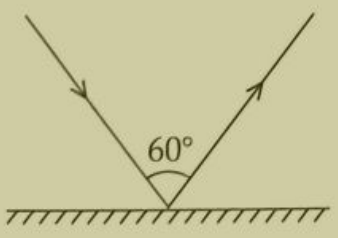
Score

PART - I

(A) Answer any four questions from 1 to 6. Each carries 1 score. **4x1=4**

1. Name the arrangement in a DC motor to sustain the rotation of the armature in one direction. 1

2. In the figure, a beam of light which incidents on a surface and its reflection is depicted. 1



If the angle between them is 60° what will be the angle of incidence ?

3. If intensity of electric current in a circuit is doubled the heat energy developed in this circuit increases _____ times. 1

$\left(2, \frac{1}{2}, 4, \frac{1}{4}\right)$

Score

4. Which among the following is the graphical representation of the output emf in a DC generator ? 1

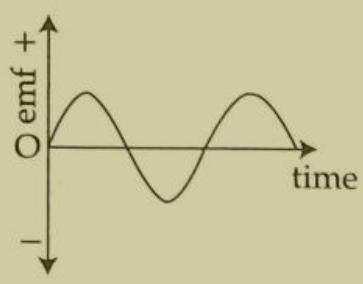


fig. 1

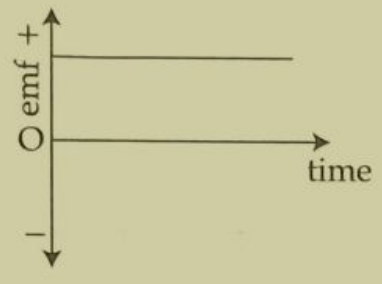


fig. 2

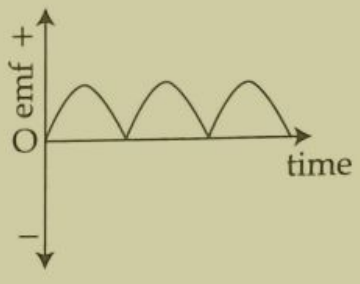


fig. 3

5. Which of the mirrors forms an image larger than the object ? 1

(Plane mirror, Concave mirror, Convex mirror)

6. In which condition do all the component colours of white light undergo the same scattering ? 1

(B) Answer all the questions from 7 to 9. Each carries 1 score. 3x1=3

7. Which of the following light source does not contain mercury in it ? 1

[Fluorescent lamp, LED, CFL]

8. Which rule gives the direction of current produced in a conductor when it moves perpendicular to a magnetic field ? 1

9. If two plane mirrors are placed at an angle of 60° between them what will be the number of images formed by them ? 1

PART - II

(A) Answer the following question carries 2 score. 1x2=2

10. Write any two characteristic properties of the material used as heating coil in heating devices. 2

(B) **Answer any one question from 11 to 12. Each carries 2 score.** Score 1x2=2

11. How many units of energy will be consumed by a 100 W bulb in 30 days, if it works 10 hours everyday ? 2

12. Explain how light energy is produced in discharge lamps ? 2

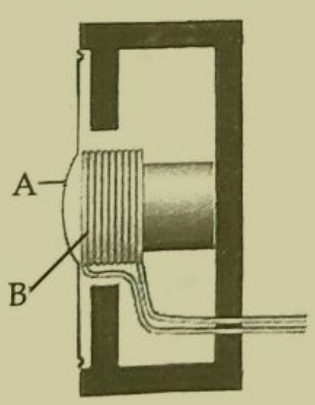
PART - III

(A) **Answer any three questions from 13 to 16. Each carries 3 score.** 3x3=9

13. A real image was formed at a distance of 20 cm from a concave mirror when an object was placed at a distance of 30 cm from the mirror.
    (a) Calculate the focal length of the mirror using New Cartesian sign convention. 2
    (b) What will be the magnification of the image ? 1

14. Solenoids are used to make electromagnets.
    (a) If the direction of the DC current through the solenoid at the end facing us is in clockwise, which magnetic pole is developed at this end ? 1
    (b) Suggest two methods to increase the magnetic field strengths of a solenoid. 2

15. Observe the figure of the microphone.



    (a) Write the names of Part A and B of the moving coil microphone. 1

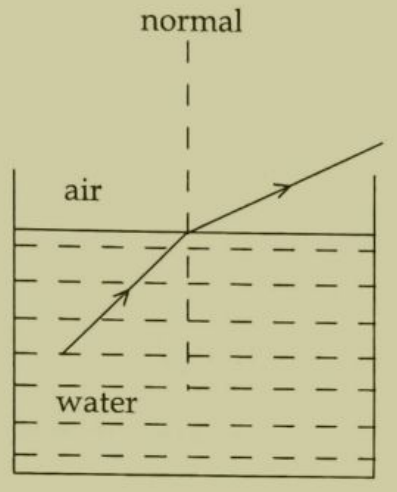
    A. = _____

    B. = _____

    (b) How does electrical signals in accordance with the sound are generated in the microphone ? 2

Score

16. Observe the given diagram.



(a) When a light ray enters into air from water the light ray _____. 1

[moves towards the normal/moves away from the normal]

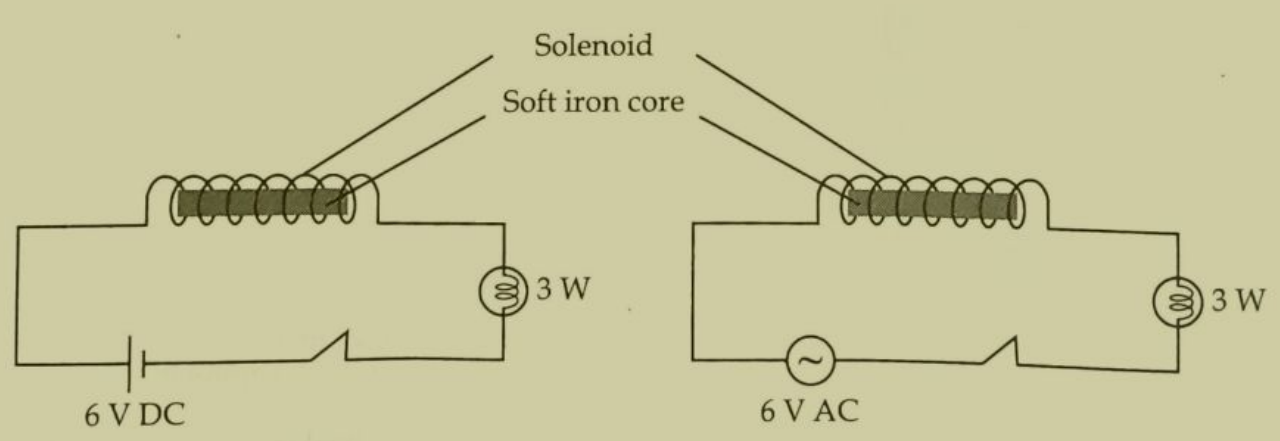
(b) Name the phenomenon which caused the deviation of light ray when it enters into air from water. 1

(c) What happens to the speed of light when it enters from water to air ? 1

[Increases, Decreases, No change]

(B) Answer the following question carries 3 score. 1x3=3

17. Observe the given figure.



(a) (b)

(a) Bulb in which circuit will glow with low intensity ? 1

(b) Explain the reason for the decrease in the intensity of light in this bulb. 2

Score

PART - IV

(A) **Answer any 2 questions from questions 18 to 20. Each carries 4 score.** 2x4=8

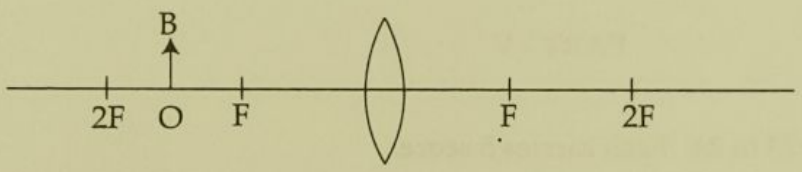
18. Coal is divided into four categories, peat and lignite are two among them.

(a) Which are the other two ? 1

(b) On what basis does coal is categorised like this ? 1

(c) Which are the products obtained when coal is distilled in the absence of air ? 2

19. Observe the position of the object OB placed in front of a convex lens.

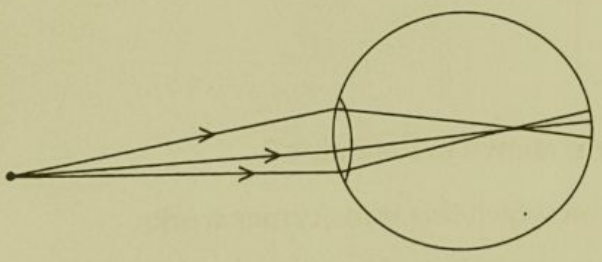


(a) Draw the ray diagram of image formation and find the position of the image. 2

(b) Write any two features of the image formed. 1

(c) Calculate the power of a convex lens with focal length 50 cm. 1

20. Observe the figure in which image formation in an eye is given.



(a) Name the defect of this eye. 1

(b) What are the reasons for this defect ? 2

(c) Suggest a remedy for this. 1

Score

(B) **Answer any one question from 21 to 22 carries 4 score.** 1x4=4

21. (a) Which material is used as filament in incandescent lamp ? 1

(b) What are the characteristic properties of the material used as filament ? 2

(c) Why these lamps are filled with Nitrogen ? 1

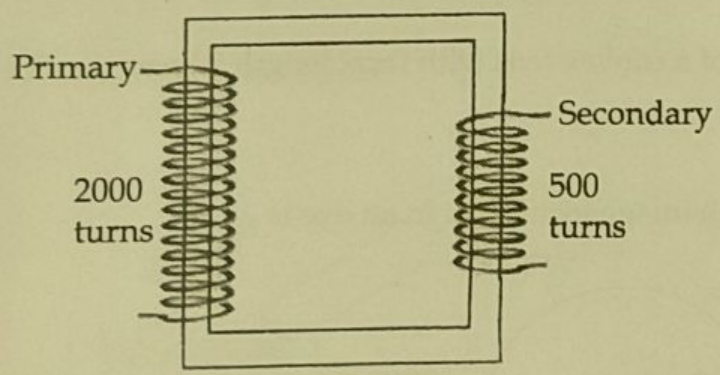
22. (a) When a beam of light entered into glass from air it was found the angle of incidence as 'i' and angle of refraction as 'r' state Snells' law which relates these angles ? 2

(b) Calculate the refractive index when the light enter into glass from air, if velocity of light in air is 3×10^8 m/s and velocity of light in glass is 2×10^8 m/s. 2

PART - V

(A) **Answer any one from 23 to 24. Each carries 5 score.** 1x5=5

23. The following figure represents a transformer with no power loss.



(a) Which type of transformer is shown in the figure ? 1

(b) Name the principle based on which this transformer works. 1

(c) If the output from secondary of this transformer is 50 V, 10 W electric power.

(i) What will be the input voltage ? 2

(ii) What is the current in the primary ? 1

Score

24. Usually we connect resistors in series and parallel.

(a) In which type of connection does the resultant resistance of the circuit decreases ? 1

(b) Two resistors of 100 Ω are connected in series with a 250 V supply. Calculate the heat energy produced when current flows through it for 2 seconds. 2

(c) State whether the quantity of heat produced increases or decreases, if these resistors connected in parallel in the same circuit with 250 V supply. Justify your answer. 2

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