SSLC EXAM 2021- PHYSICS ANSWER KEY

1. Red
2. Graphite bush
3. Persistence of Vision
4. -20 cm
5. Liquefied natural gas
6. LPG
7. Total Internal Reflection
8. Beyond 2f
9. a. Electrical energy to Light Energy
   b. Electrical energy to Mechanical Energy

10. a. heating coil
    b. Nichrome

11. ➜ Over loading- A circuit is said to be overloaded if the total power of all the appliances

    connected to it is more than what the circuit can withstand.

    ➜ Short Circuit -If the positive and the negative terminals of a battery or the two wires from

    the mains come into contact without the presence of a resistance in between, they are said to

    be short- circuited.

12. To increase the strength of the magnetic field produced on a solenoid

    ➜ Increase the intensity of the electric current.

    ➜ Increase the no of turns in the solenoid.

    ➜ Use soft iron as the core of the solenoid.

    ➜ Increase the area of cross section of the soft iron core.

    (Write any two)

13. a. A- Voice Coil   B- Field Magnet

    b. The diaphragm connected to the voice coil vibrates in accordance with the sound waves
    falling on it. As a result, electrical signals corresponding to the sound waves are generated in the
    voice coil

14. ➜ Raise the temperature of the body by massaging.

    ➜ Give artificial respiration.

    ➜ Massage the muscles and bring them to the original condition.

    ➜ Start first aid for the functioning of the heart. (Apply pressure on the chest regularly)

(Any Two)

15. a. Whenever there is a change in the magnetic flux linked with a coil, an emf is induced in the coil. This phenomenon is electromagnetic induction.

b. It can be defined as the generation of a potential difference in a coil due to the changes in the magnetic flux through it. In simpler words, electromotive Force or EMF is said to be induced when the flux linking with a conductor or coil changes.

16. a. Angle of incident, $i = 90-40 = 50^0$

b. Angle of incident = angle of reflection
 i = r

17. a. Distance of object, u = -30cm

Distance of image, v = -15cm

b. Focal length of the mirror f= UV/U+V

= -30x-15/-30+(-15) = 450/-45 = -10cm

18. Medium A

Reason: We can understand from the figure that the angle of incident is greater than angle of refraction, so medium A has low optical density. As optical density decreases speed of light through the medium increases.

19. (a) North pole

(b) Maxwells right hand thumb rule- Imagine you are holding a current carrying conductor with the right hand in such a way, that the thumb points in the direction of the current. The direction in which the other fingers encircle the conductor gives the direction of the magnetic field.

20. Green energy provides real benefits for the environment since the power comes from natural resources such as sunlight, wind and water. Constantly replenished, these energy sources are the direct opposite of the unsustainable, carbon emitting fossil fuels that have powered us for over a century.

Creating energy with a zero carbon footprint is a great stride to a more environmentally friendly future. If we can use it to meet our power, industrial and transportation needs, we will be able to greatly reduce our impact on the environment.

21. a. 600C

b. R= v/i = 230/2 = 115 Ω

c. Power P= I^2R = 2^2x115= 4x115= 460W

22. a. Resistors are connected in series,
R1 = 4 Ω

R2 = 6 Ω

R3 = 12 Ω

Effective R of the device = R1 + R2 + R3 = 4+6+12 = 22 Ω

b. Lowest resistance can be obtained by connecting the resistances in parallel

R= R_1R_2/ R_1+R_2 = 6x12/6+12 = 72/18 = 4 Ω

23.   a. Step up transformer (11kV to 220kV)

b. Step down transformer (11kV to 230V)

c.

Step up transformer	Step down transformer
Number of turns in the primary coil is lesser than Secondary coil	Number of turns in the primary coil is greater than Secondary coil.
Output voltage is greater than input voltage.	Input voltage is greater than output voltage.
Thickness of primary coil is greater than secondary coil.	Thickness of secondary coil is greater than primary coil,
Input current is greater than output current.	Output current is greater than input current.

24.   a. A – AC generator, B – battery, C – DC generator

b. A: emf in the circuit is varying because the direction changes continuously,

   B: direction is steady, emf is constant

25.   a. Fossil fuels are formed by the transformation of plants and animals that went under the earth's crust millions of years ago. The transformation took place in the absence of air under high pressure and high temperature.

b. Coke, coal gas, gaseous carbon, coal tar, ammonia liquor, and coal oil

26.   a. Dispersion is the phenomenon of splitting up of a composite light into its constituent colours.

b. Sunlight passes through the water droplets in the atmosphere refracted twice, and has one internal reflection also. Colour seen at the upper edge of the rainbow is Red and Colour seen at the lower edge of the rainbow is Violet. The light ray emerging from the water droplets which make the same angle with the line of vision have the same colour. These droplets appear in the form of an arc of a particular colour.

27.   a. When a ray of light passes from a medium of greater optical density to that of lower optical density, the angle of incidents at which the angle of refraction becomes 900 is the critical angle

b. When a ray of light passes from a medium of higher optical density to a medium of lower optical density at an angle of incidence greater than the critical angle, the ray is reflected back to the same medium without undergoing refraction. This phenomenon is known as total internal reflection.

28.   a. If magnification is negative, it means image formed by the mirror is real and inverted.

b. Magnification is defined as the ratio of the height of image to height of object

Magnification, m=height of image/height of object = h_i/h_o= -v/u

c. Concave mirror

29.   a. DC Generator

b. Electromagnetic induction

c. AC

d. Split rings are used to convert the AC into DC

30.   a. Figure B

b. The bulbs in both the circuits will glow at the beginning, but if it kept on, the intensity of the bulb in circuit B will gradually decrease

c. Since the circuit B is AC, a back emf is induced in it due to self- induction, the resultant voltage across the bulb decreases and because of this, brightness of the bulb decreases.

31.   a. i. Same Side of the object

ii. Microscope/ Telescope

b. Characteristics of Image formed by convex lens

Position of object	Position of image	Nature of image/ size		
		Real/ virtual	Inverted/ erect	Magnified/ diminished/ same size
At infinity	At F	Real	Inverted	Diminished
At 2F	At 2F on other side.	Real	Inverted	Same size
Between 2F and F	Beyond 2F on other side.	Real	Inverted	Magnified.

32.   a. $R_{effective}$ = R1 + R2 = 100 + 15 = 115 Ω

b. Current, I = V/R = 230/115 =2A

(c) Heat, H = I²Rt , I = 2A

R= 100 Ω, t = 10 min

10× 60 = 600s

= 2²×100×600 = 240000J

33.   a. Safety fuse is a device which protects us and the appliances from danger. When the current that flows into the circuit exceeds the permissible limit, the heat generated
becomes excessive. Because of it's low melting point the fuse wire melts and break the circuit.
b. Fuse wire is an alloy of tin and lead and it has low melting point.
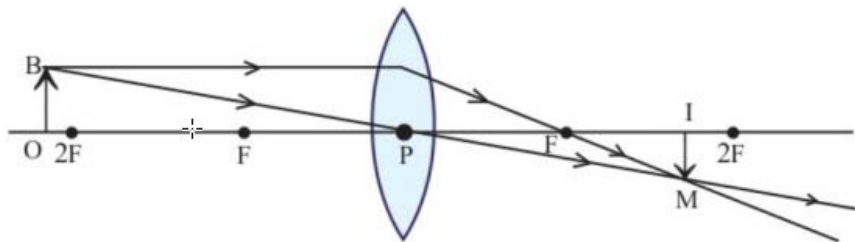
c. The ends of the fuse wire must be connected firmly at appropriate points.

The fuse wire should not project out of the carrier base.

Use fuse wire of appropriate amperage.

Fuse wire is connected in series

34.   a

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b. Inverted, real, diminished, between F and 2F