PHYSICS

FOCUS AREA & NON FOCUS AREA FOR SSLC EXAM 2022

UNIT NUMBER	UNIT NAME	FOCUS AREA	NON FOCUS AREA
1	Effect of electric current	• Energy change in electrical instruments, • Heating effect of electric current, Joule's Law, • Mathematical problems, • Electric power, • Related mathematical problems, • Electric heating instruments • Peculiarities of substances used as heating coil • Short circuit • Overloading, Working of Safety fuse • Peculiarities of substances used as fuse wire • Arrangement of resistances – Parallel and series combination, Related problems	◆ Lighting effect of electric current ◆ Incandescent lamps ◆ Discharge lamps ◆ LED Lamps ◆ LED Bulbs(Construction, repair, reuse and disposal)
2	Magnetic effect of electric current	• Magnetic field around a current carrying conductor • Right hand thump rule • Magnetic field around a Solenoid • Magnetic polarity • Factors effecting the Magnetic field • Motor principle	◆ Comparison between electromagnet and bar magnet ◆ Right hand screw rule ◆ Fleming's Left hand rule

		• DC motor • Moving coil loudspeaker- Structure and working.	
3	Electromagnetic induction	• Electromagnetic induction • Factors effecting induced emf • Current from AC generator, DC generator and cell- Characteristics and graphical representation • AC and DC generator- Structure and working • Mutual induction • Transformers- Structure • Moving coil microphone • Power transmission in high voltage • Electric shock-first aid.	◆ Fleming's right hand rule ◆ AC and DC current- definition ◆ Comparison of graphical representation of AC wave in one period ◆ Transformer problems ◆ Vs/Vp = Ns/Np ◆ Self Induction - Inductor ◆ Power distribution ◆ Household Electrification ◆ Watt-Hour Meter- calculation ◆ Safety measures in household electrification- MCB ,ELCB ◆ Three pin Plug- Earthing Electric shock- precautions ◆ Making household circuits
4.	Reflection of light	• Reflection • laws of reflection • Characters of image formed in concave mirror and convex mirror • Mirror equation,	◆ Image formation by a plane mirror ◆ Multiple reflection and image formation ◆ Ray diagrams of

		magnification and related problems **• New Cartesian sign convention**	**image formation**
5	**Refraction of light**	**• Refraction, Relation between optical density and speed of light** **• Refraction in different medium (figure)** **• Critical angle** **•Total internal reflection** **• Lens technical terms – complete** **• Image formation, ray diagrams, characters of image** **• Power of lens**	**◆ Laws of refraction** **◆ Snell's law** **◆ Speed of light and refractive index** **◆ Calculation using lens equation** **◆ New cartesian** **◆ Magnification** **◆ Atmospheric refraction**
6	**Vision and the world of colours**	**• Short sightedness** **• Long sightedness – Reasons and Remedies** **• Dispersion** **• Rainbow, Scattering of light, relation between wavelength of colours and scattering** **• Reason for red Colour of the rising and the setting sun**	**◆ Presbyopia** **◆ Recombination of colours** **◆ Persistence of vision** **◆ Tyndale effect** **◆ Light pollution**
7	**Energy sources**	**• Incomplete and complete combustion** **• Fossil fuels-coal, CNG, LNG, LPG.** **• LPG and safety,** **•Green energy, brown energy, Energy crisis-reasons and solutions**	**Sources of energy** **Biomass** **Fuel efficiency** **Calorific value** **Hydrogen-Fuel cell** **Different Power plants** **Solar panel** **Devices to convert heat from solar energy** **Nuclear energy**

QUESTIONS AND MARK DISTRIBUTION FOR THE SSLC MODEL QUESTION PAPER-2022

UNIT	Focus/ Non-focus area	A 1 Score	B 2 Score	C 3 Score	D 4 Score	E 5 Score	Total marks
UNIT-1	FA	1	1			1	11
	N FA			1			
UNIT-2	FA	1					7
	N FA		1		1		
UNIT-3	FA	1				1	11
	N FA	1			1		
UNIT-4	FA			1	1		8
	N FA	1					
UNIT-5	FA	1		1	1		8
	N FA						
UNIT-6	FA			2			10
	N FA				1		
UNIT-7	FA	2					5
	N FA	1	1				
FA MARKS -42			N-FA MARKS -18			Total	60

Weight age and mark distribution may change in each question paper

Instructions

- ***15 minute is given as cool-off time. this time is to be used to read and understand the questions well.***
- ***If a question contains choices, the required number of questions need to be answered.***
- ***The instructions and its marks for each questions are given along with the questions.***

1. ***What is the power of an electric heater that works at 3600Joules per minute ?***
   [600W , 6W , 60W, 606W]

2. ***Write the working principle of transformer ?***

3. ***Write any two fossil fuel ?***

4. ***What can be done for reducing energy crisis .Write any two***

5. *From the list bellow select the device that works on the principle of motor.*

   [AC Generator, Moving coil microphone , inductor, Loud - speaker]

6. *Find out the power of a concave lens of focal length 50cm ?*

7. *What is the unit in which the watt-hour meter measures the electrical energy*
   [Watt , Kilowatt , watt hour , Kilowatt hour]

8. *An object was placed one meter away in front of a plane mirror. Which is the correct statement about the image formation*

   a) *Image is real and enlarged one meter inside the mirror*
   b) *Image is Virtual and enlarged one meter inside the mirror*
   c) *Image is real and diminished one meter inside the mirror*
   d) *Image is virtual and of same size one meter inside the mirror*

9. *Write the difference between Biomass and Biogass*

10.
a) *What happens when an overloading or short-circuit occurs in a circuit ?*

   1score

b) *How a fuse can be used to protect this electrical circuit ?*

   1score

11. Write any two difference between an electro-magnet and a Bar magnet

2score

12.

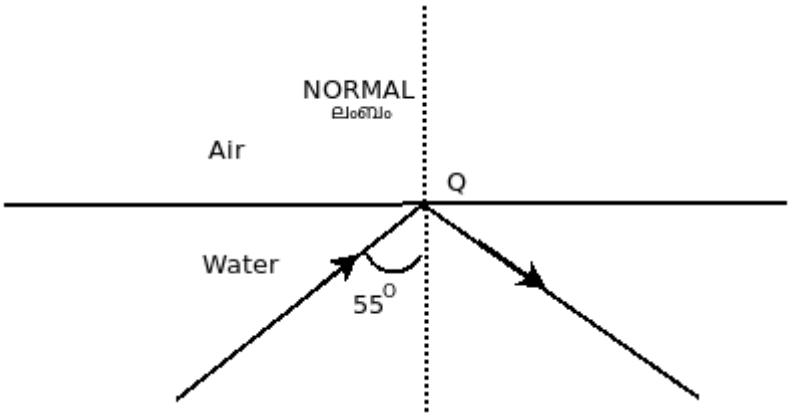
a) Define the calorific value of a fuel ?

1score

b) Based on the calorific value which fuel is the most efficient ?

1score

13. Analyse the figure



a) ***What will be the angle of reflection in the above case ?***

1score

b) ***Write the laws of reflection ?***

2score

14. Refractive index of three transparent mediums are given

Medium	Refractive index(n)
A	**1.5**
B	**1**
C	**2.42**

a) ***In which medium the light has higher speed***

1score

b) ***Write any two practical application of total internal reflection?***

2score

15. diagrammatic representation of the image formed in two eyes are shown bellow

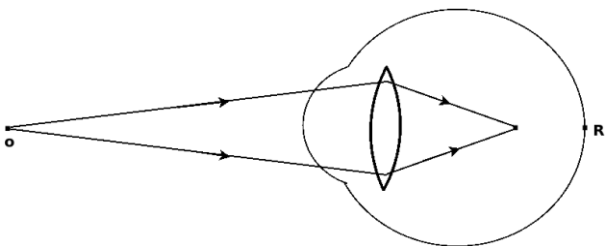


Figure-1

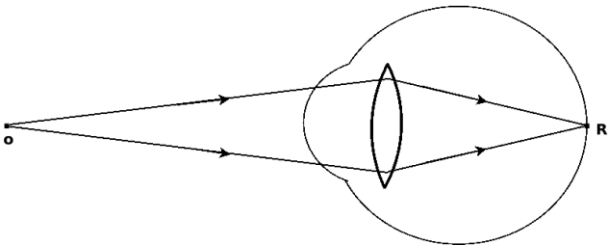


Figure-2

a) ***which figure represents the defected eye . Name the defect of that eye***

1score

b) ***Write any two reasons for this defect ?***

1score

c) ***What is the remedy for this defect ?***

1score

16.

a) Explain the reason why the rising and setting sun appears red ?

2score

b) What is the relation between scattering and the wavelength of light ?

1score

17.

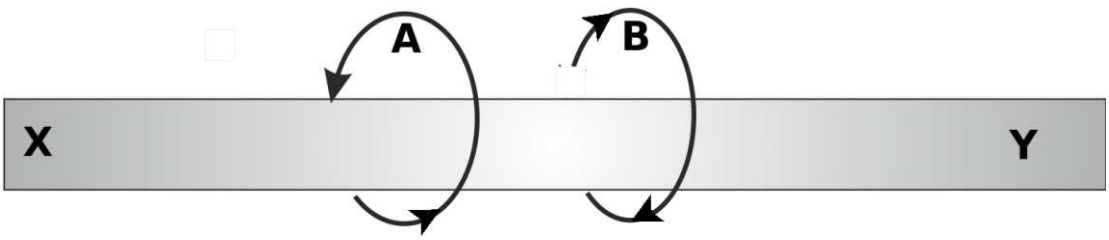
a) Write the name of any two type of lamps that we are using ?

1Score

b) Write the advantages of LED Lamp over other lamps ?

2score

18. Analyse the given figure



a) Current flows from X to Y which marking about the direction of magnetic field around the given conductor is true ?

1score

b) Name the rule which helps us to find out the direction of magnetic field around a current carrying straight conductor?

1score

c) State the above rule ? *2score*

19

a) Two statements are given bellow. which mirrors are consistent with the statements.

- *A mirror always gives an erect and diminished image.*
- *A mirror that creates an erect and enlarged image when an object is placed between F and P.*

2score

b) Write the mirror equation and explain each letter used in it ?

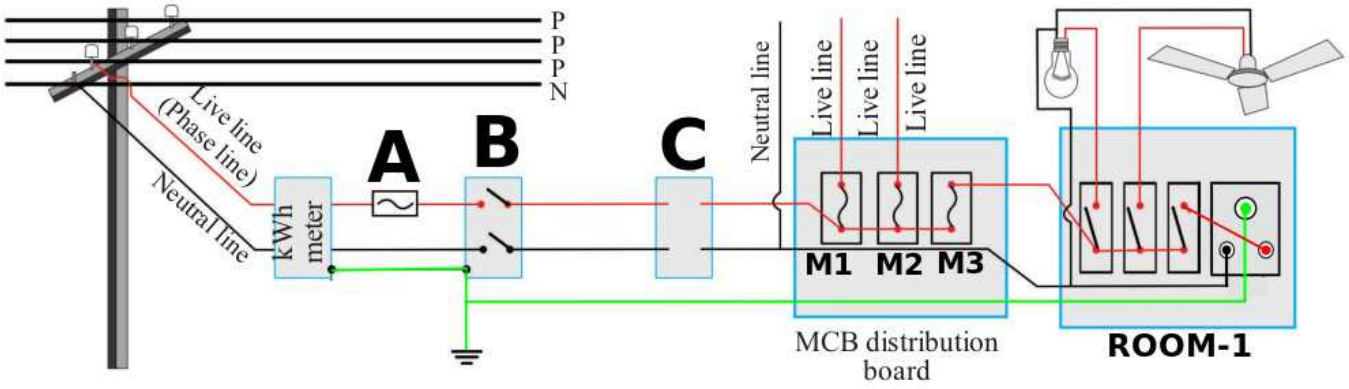
2score

20. Statements regarding the place of the object, location of the image formed and the nature of images of a convex lens are given in three columns of a table. Find out the matching statements for the first column from the second and third .

4 score

Place of the object (A)	Location of the image (B)	Nature of the image (C)
1. At F	Image at 2F	Small, erect, virtual
2. Between F and lens	Image at F	Enlarged ,erect ,virtual
3. Object beyond 2F	Image beyond 2F	Small, inverted, real
4 Object at infinity	between F and 2F	Enlarged, inverted, real
	No image formed	Small, inverted, real
	Image at the same side of object	No characteristics

21. Analyse the household wiring circuits



a) Identify any two device labelled as A, B, C ?

1score

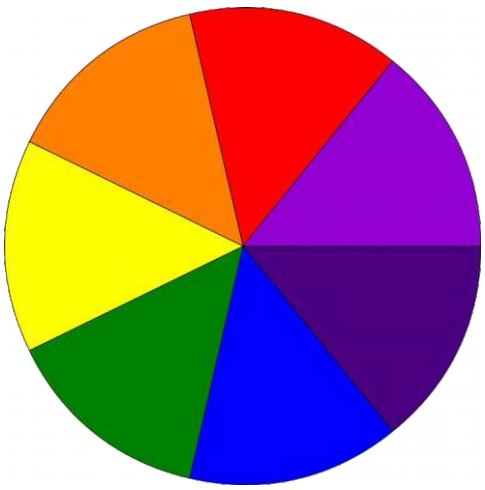
b) Which MCB is used for the Room-1 among the M1,M2,M3 ?

1score

c) What is a Watt-Hour meter

2score

22. Picture of Newton's colour disc is given



a) ***Which are the colours used on newtons colour disc ?***

1score

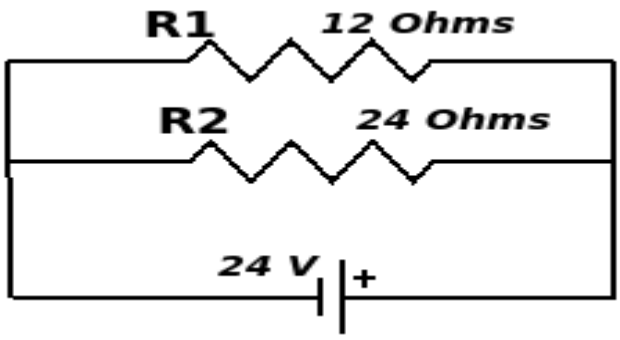
b) ***In which colour the disc appears while it rotating fast?***

1score

c) ***Explain the phenomenon persistence of vision ?***

2score

23. ***Observe the figure***



a) ***Identify the type of connection for the resistors in the given figure ?*** ***1score***

b) ***Calculate the heat generated in the resistance R2 in 5 minutes by using joules law*** ***2score***

c) ***Calculate the heat generated in the same resistance R2 in 5 minutes if the two resistanceR1 and R2 are connected in series*** ***2score***

24.

a) ***Write the name of any two devices that works on electro-magnetic induction?*** ***1score***

b) ***Define the phenomenon electro-magnetic induction ?*** ***2Score***

c) ***write the factors that effects the induced emf ?*** ***2Score***

SSLC ANNUAL SAMPLE
QUESTION PAPER- MARCH 2022
PHYSICS- KEY

Question Number	Answers	Score
1	P = W/t = 3600/60 = 60W	1Score
2	Mutual Induction	1Score
3	Petrol ,Diesel, -- Any two	1Score
4	Judicious utilisation of energy. Maximum utilisation of solar energy. - -- Any relevant two	1Score
5	Loud -speaker	1Score
6	P= 1/f = 1/0.5 = 2D	1Score
7	Kilowatt hour	1Score
8	Image is virtual and of same size one meter inside the	1Score

	mirror	
9	**fuels are obtained from plants and animals tare known as bio-waste or biomass.** **The gas obtained from biomass is biogas,**	**1Score**
PART -2		
10 **a**	**The current that flows into the circuit exceeds the permissible limit**	**1Score**
b	**The heat generated becomes excessive. Since more heat is generated in unit time than the heat transmitted, the fuse wire melts.**	**1Score**
11	**Bar magnet-The magnetism is permanent** **Polarity can't be changed** **Solenoid-The magnetism is temporary** **The strength can be changed** **Any two difference**	**2 Score**
12 (a)	**The amount of heat liberated by the complete combustion of 1 kg of fuel is its calorific value.**	**1Score**
12(b)	**Hydrogen**	**1Score**
PART -3		

13(a)	**55^0**	**1Score**
13(b)	**When light is reflected from a smooth surface, the angle of incidence and angle of reflection are equal. The incident ray, reflected ray and normal to the surface are in the same plane.**	**2 Score**
14(a)	**Medium B**	**1Score**
14(b)	**Endoscope. Optical fibre cables. Any two**	**2 Score**
15(a)	**Figure-1 ,Myopia or Near-sightedness**	**1Score**
15(b)	**For some people, the eyeball may be long. For some others, even though the eyeball is normal in size, power of the lens may be more.**	**1Score**
15(c)	**This can be overcome by using concave lens of suitable power.**	**1Score**
16(a)	**During sunrise and sunset, light reaching us from the horizon has to travel long distances through the atmosphere. During this long journey, colours of shorter wavelength would be almost fully lost due to scattering. Then, the red light which undergoes only less amount of scattering decides the colour of the horizon.**	**2 Score**
16(b)	**scattering and the wavelength of light is inversely proportional**	**1Score**

17(a)	**Incandescent Lamp, LED Lamp**	**1Score**
17(b)	**there is no loss of energy in the form of heat.** **Since there is no mercury in it, it is not harmful to environment** **----------Any relevant two**	**2 Score**
18(a)	**Marking B is true**	**1Score**
18(b)	**Right Hand Thumb Rule of James Clark Maxwell.** **OR** **Right Hand Screw Rule.**	**1Score**
18(c)	**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.**	**2 Score**
19(a)	**A mirror always gives an erect and diminished image. -- Convex mirror** **A mirror that creates an erect and enlarged image when an object is placed between F and P. ------- Concave mirror**	**2 Score**
19(b)	**1/f = 1/u +1/v OR f = uv / u+v** **f -Focal length , u – distances of oblect** **v – distances of image**	**2 Score**

20	1. At F - No image formed- No characteristics	1Score
	2. Between F and lens - Image at the same side of object - Enlarged ,erect ,virtual	1Score
	3. Object beyond 2F -between F and 2F - Small, inverted, real	1Score
	4 Object at infinity- Image at F -Small, inverted, real	1Score
21(a)	A – Main fuse B – Main switch C – ELCB Any two	1Score
21(b)	The MCB- M3	1Score
21(c)	Watt - hour meter is a device that is used to measure electrical energy. Electrical energy is measured using the unit kilowatt hour.	2 Score
22(a)	VIBGYOR (Expanded names)	1Score
22(b)	White	1Score
22(c)	When an object is viewed by a person, its image remains in the retina of the eye for a time interval of 0.0625s │ 1/16 s │after seeing it. This phenomenon is called persistence of vision	2 Score

23(a)	**Parallel connection**	**1Score**
23(b)	**R1 = 12 ohms , R2 = 24 ohms , V = 24v** **t = 300s** **H =I^2Rt OR H=V^2 /R*t** **I= V/R** **H = 7200 J**	**2 Score**
23(c)	**In series total resistance = R1+R2 = 36** **I = V/R = 24/36 = 2/3 A** **In series connection current is same in each resistor.** **H =I^2Rt = 3200J** **The equation H=V^2 /R*t can't be used here directly other wise calculating the voltage across the resistor R2 individually.**	**2 Score**
24(a)	**Generator** **Moving coil microphone**	**1Score**
24(b)	**Whenever there is a change in the magnetic flux linked with a coil, an emf is induced in the coil. This phenomenon is electro-magnetic induction.**	**2 Score**
24(c)	**Number of turns of the coiled conductor** **Strength of the magnetic field** **Motion per unit time** **Any two**	**2 Score**