SSLC A, A+ STUDY MATERIAL

PHYSICS

Prepared By

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PHYSICS

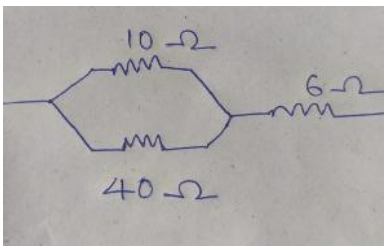
CHAPTER 1 EFFECTS OF ELECTRIC CURRENT

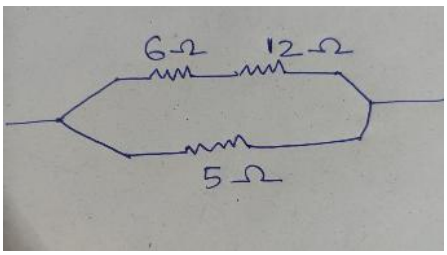
ONE MARK QUESTIONS

1. Fill in the blanks
   Tungsten : Filament lamp
   _____ : Electric iron
2. The part of an LED bulb where LEDs are fixed
   (Base unit , LED driver, Printed Circuit Board, Base plate)
3. Find the odd one out and Give reason
   (I^2Rt, V^2t/R, QV, VI)
4. Write the name of heating appliances which do not use heating coil.
5. Find the minimum number of 3Ω resistors required to form a circuit of effective resistance 19 Ω.

TWO MARK QUESTIONS

6. When two resistors are connected to a circuit the resultant resistances are 1Ω and 4 Ω. Calculate the value of each resistor.
7. Calculate the effective resistance in each case.





8. Safety fuse is a device that works on the heating effect of electric current.
   a) Why is the fuse used in a circuit called safety fuse? Explain?
   b) What are the precautions to be taken when a fuse wire is included in a household wiring.
9. Fill in the blanks

Device	Energy change
Microwave oven	.....

Inverter(while discharging)	.....

10. A 800 W electrical device is designed to work in 200V. What will be its power if the device is working in 100V?

THREE MARK QUESTIONS

11.Correct the mistakes, if any.
a)Amperage is the ratio of the power of an equipment to the voltage applied.
b)Connecting appliances in a circuit beyond its power capacity is short circuit.
c)It is to reduce the heat loss that electric lamps are filled with inert gases.
12.Two types of lamps are given below.
1.Discharge lamp
2.Filament lamp
a)If nitrogen gas is filled in each lamp, What change will happen to their working?
b)Why is it said that the use of filament lamp must be controlled?
c)Advantages of LED bulb over filament lamp.
13.An electrical appliance of resistance 115Ω is working in a 230V supply.
a)calculate the current through the circuit.
b)What is the power of this appliance.
c)Calculate the heat produced if the current flows for 20s.

14. Classify the following statements in a table and give suitable titles.
a) Effective resistance decreases
b) The current through each resistor is the same.
c) The potential difference across each resistor is the same.
d) each resistor can be controlled saparately.

FOUR MARK QUESTIONS

15.**Match the following suitably**

a) Incandescent lamp	Mercury	Excited atoms comes to the original state to attain stability

b)C F L	Nichrome	Low efficiency
c)Electric heater	Lights of different colours and radiations are produced	Harmful to environment
d)Discharge Lamp	Tungsten	Ohmic heating

16.
a) What is Electric power? How is it calculated?
b) An electric heater of power 920 W is working on a 230 V supply. If current flows for 5 minutes through it, Calculate the heat generated.

FIVE MARK QUESTIONS

17. An electric heater draws a current of 2A from a supply of 230 V.
a) How long will it take to produce a heat of 138000 J.
b) Find the quantity of charge carried by the heater during this time.
c) What is the resistance of the heater if it is designed to work in 230 V supply.
d) What will be it's power at 115v supply.
e) state Joule's Law
18. Two resistors of 2Ω,3Ω,6V battery and connecting wires are given
a) Depict a figure of series connection using these components
b) calculate the effective resistance of series connection
c) Calculate the current in the circuit.
d) Depict a figure of parallel connections.
e) Give two features of series and parallel connection of resistors.

VALUE POINTS

ONE MARKS

1. Nichrome
2. Printed circuit board
3. VI This denotes power. Others are equations for Heat/ Energy.
4. Induction cooker
5. 9 resistors. Six 3Ω resistors in series and three 3Ω resistors in parallel.

TWO MARKS

6. 2Ω each

7. a) $R = R_1R_2/R_1+R_2$

Effective resistance= 14Ω

b) R= 4.69 Ω

8. a) Safety fuse is a device which protects us and the appliances from danger when an excess current flows through the circuit.

b) The ends of the fuse wire must be connected firmly at appropriate points.

The fuse wire connected to a circuit in series.

9. a) Electrical energy to heat energy

b) Chemical energy to electrical energy

10. $R = V^2/P = 50\Omega$

P IN 100V = V^2/R = 200W

THREE MARKS

11. a) correct

b) Not short circuit it is overloading

c) Inert gas in filament lamp to reduce rate of evaporation

12. a) Nitrogen filled in discharge lamp will give red light

In filament lamp – reduce evaporation

b) Major part of electrical energy is converted to heat energy

c) Low power consumption, high efficiency

13. a) I= V/R =2A

b) $P = I^2R$ = 460 W

c) $H = I^2Rt$ = 9200 J

14. Parallel - a,c,d suitable titles - 1mark

Series - b points -2 marks

FOUR MARKS

15.

a) Incandescent lamp	Tungsten	Low efficiency
b)C F L	Mercury	Harmful to environment
c)Electric heater	Nichrome	Ohmic heating
d)Discharge Lamp	Lights of different colours and radiations are produced	Excited atoms comes to the original state to attain stability

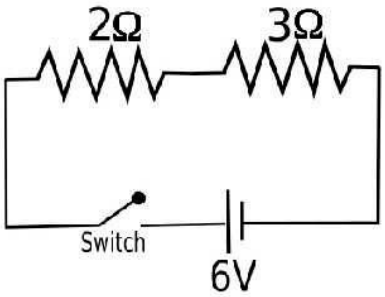
16. a)power- defn
equations
b) H=VIt = 276000J

FIVE MARKS

17. a) H=VIt
t=300s
b) Q=It = 600 C
C) R=V/I = 115Ω
d) $P=V^2/R$
e) law

18.

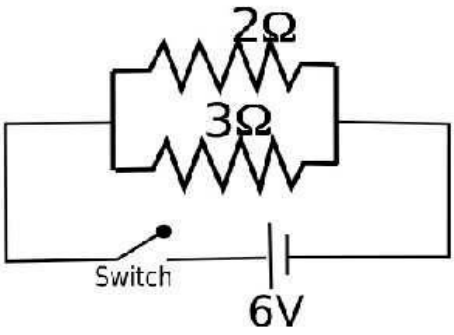
a)



b) 5Ω

c) 1.2 A

d)



e) features

Chapter-2

Magnetic effect of electric current

Section A (score 1)
Focus Area

1.Name a device that convert electrical energy into mechanical energy

2.Identify the magnetic pole at the end of a solenoid at which current is in the anticlockwise direction.

3.From the following, choose the instruments that works in motor principle
(AC generator, moving coil microphone, DC generator, moving coil loudspeaker)

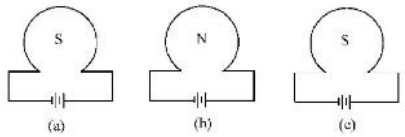
4. Correct the following statement by changing the underlined words:
The direction of deflection of a magnetic needle placed near a current carrying conductor depends on the intensity of electric current through the conductor.

5.Find out the odd one in the group and write the reason. (Voice coil, field magnet, slip rings, armature)

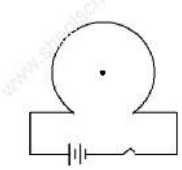
6.Choose the incorrect statement related to electromagnets.
a. The magnetism is permanent
b. Strength can be increased or decreased.
c. The polarity can be reversed by changing the direction of current through it.

Non Focus Area

7. Which of the following figures related to the polarity of a current carrying coil is correct?



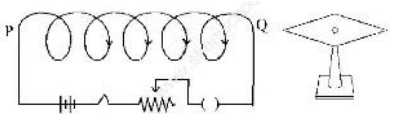
8. Figure shows a circular coil carrying current. Draw the magnetic field line through the centre of the coil.



Section B (score 2)

Focus area

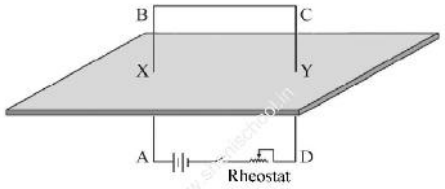
9. A magnetic needle is arranged at the end Q of a solenoid PQ.



a)When the switch is on ,which pole of the magnetic needle is attracted towards the end Q?
b) State the fact that helped you to reach the above conclusion?

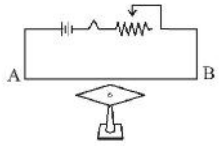
10. Explain the working of a split ring commutator in a DC motor.

11. A conductor is inserted through a cardboard and kept in a vertical position as in the figure. The portion passing through the cardboard are marked X and Y



a) What will be the direction of the magnetic field around X when we look from B? (Clockwise/anticlockwise)
b) State the law to find the direction.

12. A straight conductor AB is arranged parallel to a magnetic needle as shown in figure. When the switch is on, the magnetic needle deflects.



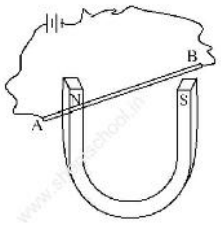
a) The direction in which the north pole of the magnet deflect is (clockwise/anticlockwise)
b) What might be the reason for the deflection of the magnetic needle?

Non Focus area

13. Match the column A appropriate with column B

A	B
To find the direction of force in a current carrying conductor	Fleming's right hand rule
To find the direction of magnetic field around a current carrying conductor	Maxwell's right hand thumb rule
	Fleming's left hand rule

14) Figure shows a straight conductor arranged perpendicular to a strong U magnet.

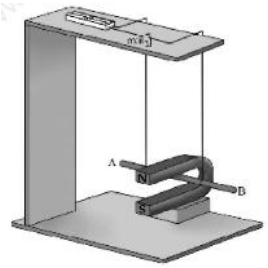


a) In which direction will the conductor move when the switch is on?
b) Name the law used to find the direction of motion of the conductor?

Section C (score 3)

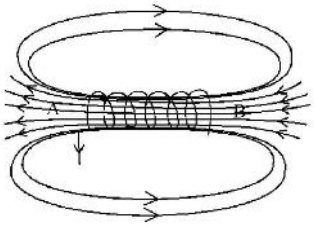
Focus area

15. A straight conductor AB is arranged so as to move freely in the magnetic field of a U magnet as shown in figure.



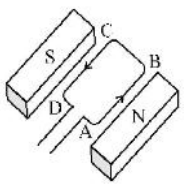
a) In which direction will the conductor AB move when the switch is on?
b) Name the law used to find the direction of motion of the conductor.
c) Suggest a method to keep the direction of motion of the conductor constant, even when the current is reversed.

16. The magnetic field lines around a solenoid are shown in figure.



a) Identify the direction of flow of current at the end A of the solenoid
b) find out the relationship between the direction of current and the polarity

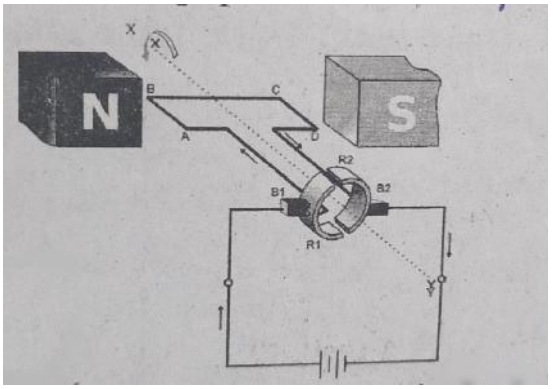
17. ABCD is a rectangular coil arranged so as to move freely in a magnetic field.



a) In which direction will the coil rotate when a current is passed through the coil in the

direction ABCD?
b)Why is the commutator necessary for the continuous rotation of the coil?

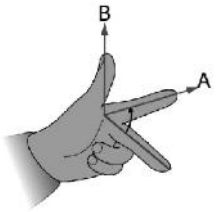
18. Observe the diagram and answer the following question.



a) Name the device.
b) What does R1 and R2 indicate in the figure? Write the functions of these.

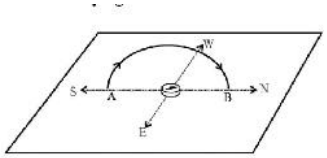
Non Focus area

19. Figure shows Fleming's left hand rule.



a)Write the one suitable for A and B.
b) State Fleming's left hand rule.

20. The figure shows an experimental arrangement to study the intensity of the magnetic field around a current carrying coil.

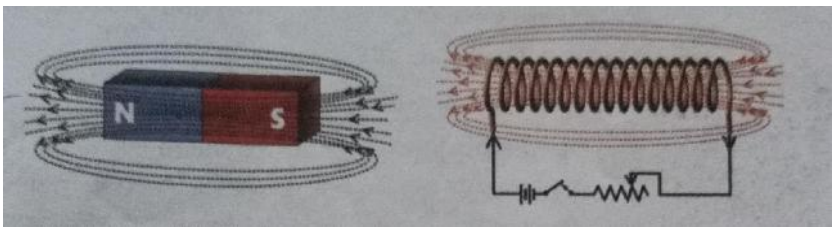


a) What is the direction of the magnetic field produced by the circular coil shown in figure?
b) Suggest two methods to increase the magnetic field strength of a circular coil.
c) Why is the coil kept in the North to South direction?

Section D (score 4)

Focus area

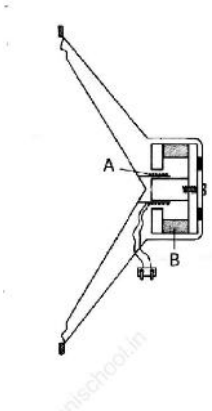
21. Depicted below are the lines of force formed around a solenoid carrying current and a bar magnet.



a) Write two differences between a solenoid and a bar magnet.
b) Which are the factors affecting the strength of the magnetic field of a solenoid carrying current?

Section E(score 5)

22. Figure shows a moving coil loudspeaker.



a) Name the parts marked A and B.
b) What is the energy conversion in this device?
c) What is the working principle of a moving coil loudspeaker?
d) Explain the working of this device.

Answer key

Section A (each carry one mark)

1. Electric motor
2. North pole
3. Moving coil loudspeaker
4. Direction of electric current
5. Voice coil, others are parts of microphone
6. The magnetism is permanent
7. C
8. 

Section B (each carry 2 marks)

9.
   a. South pole. (1mark)

b. In the end the current is in anticlockwise direction and hence it is the north pole .Hence this end attract the South pole of the magnetic needle (1 mark)

10. Whenever current flows through the armature coil a magnetic field is developed around it and it will experience a force due to field magnet ,the armature coil starts to rotate. After every half rotation splitring helps to change the direction of current through the coil and hence it will help for the continuous rotation of armature. (2 mark)

11. a. Clock wise. (1mark)

b. Right hand thumb rule. (1mark)

12. a. Anticlockwise. (1 mark)

b. Due to the mutual interaction between the magnetic fields around the current carrying solenoid and magnetic needle. (1 mark)

13.

A	B
To find the direction of force in a current carrying conductor	Maxwell's right hand thumb rule
To find the direction of magnetic field around a current carrying conductor	Fleming's left hand rule

(2 mark)

14 a. Downwords. (1 mark)

b. Fleming's left hand rule (1mark)

Section C. (Each carry 3 marks)

15. a. Backwards. (1mark)

b. Fleming's left hand rule. (1mark)

c. Reverse the direction of magnetic field (1 mark)

16 a. Anticlockwise (1 mark)

b. The end of the solenoid at which current flows in the clockwise direction will be the South pole and end at which current flows in the anticlockwise direction will be the north pole. (2 marks)

17a. Anticlockwise direction (1 mark)

b if the rotation of the armature is to be sustained, the direction of current through the armature should change continuously the split rings help to change the direction of current through the coil after every half rotation. (2marks)

18.a. electric motor. (1mark)

b. Split rings it helps to change the direction of current after every half rotation.

(2marks)

19. a .A- magnetic field

B - force. (2 marks)

b. State the rule. (1 marks)

20. a . into the coil. (1 mark)

b. Increase the number of turns and increase the current. (1 mark)

c. To avoid the influences of magnetic field of the earth. (1 mark)

21.

a.

Solinoid	Barmagnet
The magnetism is temporary	The magnetism is permanent
Strength of magnetism can be changed	Strength of magnetism cannot be changed

(2marks)

b. Intensity of electric current
Number of turns
Area of cross section of core
Material of core. (2 marks)

22.a. A- diaphragm

B- field magnet. (1 mark)

b. Electrical energy to sound energy. (1 mark)

c. Motor principle (1 mark)

d. The electrical pulses from a microphone are strengthened using an amplifier and send through the voice coil of a loudspeaker. The voice coil which is placed in the magnetic field moves to and fro rapidly in accordance with the electrical pulses these movements make the diaphragm vibrate thereby reproducing sound.

UNIT 3

Electromagnetic Induction

PART A

1. Which is the device used to generate electricity?

a. Generator b. Galvanometer c. Motor d. Ammeter

2. …… is a device used to convert AC to DC.
   a. Generator b. Rectifier c. Microphone d. Transformer
3. Select the odd one out from the following
   a. Armature b. Graphite brush c. Voice coil d. Split ring
4. Which device is used to measure the consumption of electric energy?
5. Fill up with the suitable relation
   Control current – energy loss- resistor
   Control current – no energy loss - _____
6. Fill in the blanks
   Generator – _____ -> induced EMF
   Microphone – voice coil -> induced EMF

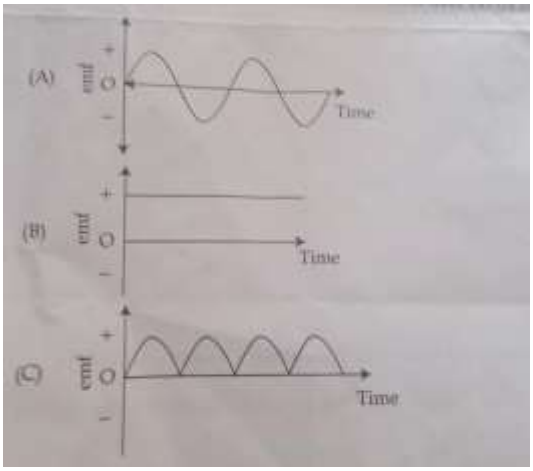
PART B

7. Choose the correct statements associated with the electromagnetic induction?
   a. When the number of turns in a solenoid is increased the induced emf decreases.
   b. When a strong magnet is used the induced emf increases.
   c. When the magnet or solenoid moved in fast the induced emf increases.
8. Write any two relevant first aids to be given in the case of electric shock?
9. Write any two methods to increase the magnetic strength of a current carrying solenoid?
10. What are the advantages of using armature as the starter in a power generator?

PART C

11. When the lines of a household circuit becomes short circuited.
    a. What is the change in the flow of current in the circuit?
    b. Name a device other than safety fuse which can be used to protect the devices in the circuit in such situation?
    c. How does three pin ensures safety?

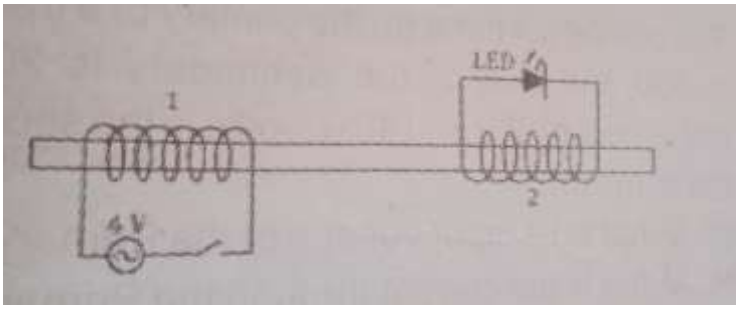
12) The graphical representation of emf obtained from 3 electrical sources are given below



(a) Identify any two sources

(b) Write any two peculiarities of each of the emf shown in the graph (A) and graph (C)

13) As shown in the figure the first windings is connected to 4 V AC source with switch and the second it is connected to a LED



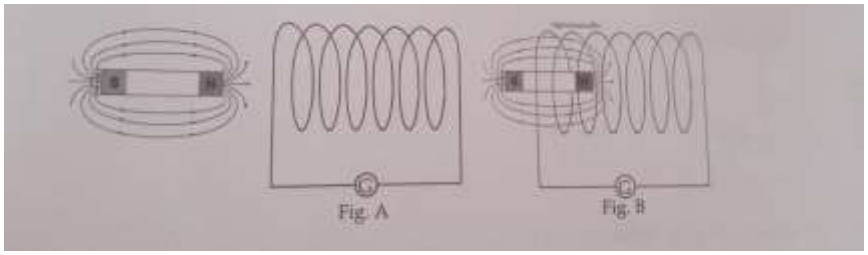
(a) When switched on , what happens to the LED?

(b) Give reason for it.

(c) Give explanation for this phenomenon.

Part D

14) Two stages of experiment conducted with a solenoid and a magnet is given below

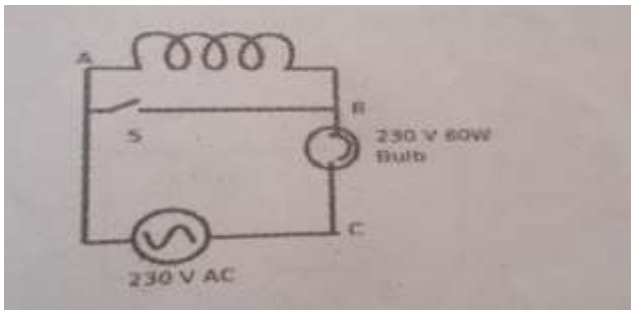


(a) In which stage the galvanometer deflects

(b) Explain the reason for this deflection in galvanometer with the help of scientific principle

(c) Write any two devices that works on this principle

15) Observe the figure



(a) When the switch is on what is the potential between B and C

(b) When the switch is in the off position what difference do you observe in voltage and light

(c) If you insert a soft iron core in the solenoid and the switch is on, what will be your observation? What is the reason behind it?

16) 3 phase AC generators are used in power stations

(a) Which are the lines essential for or household electrification?

(b) What is the method to reduce transmission loss?

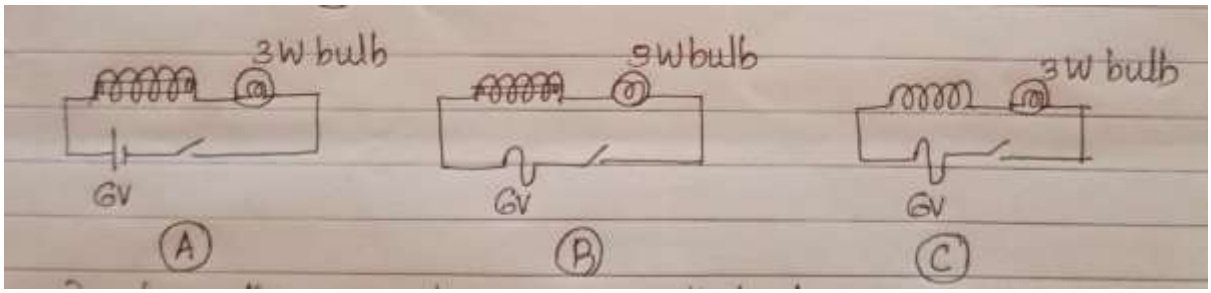
(c) Which type of transformer is a distribution transformer?

(d) If a person standing on the earth touches a phase line, will she get an electric shock? Why?

Part E

17) Observe the figure and write the answers to the following questions

(Solenoids and iron core have same length and thickness)



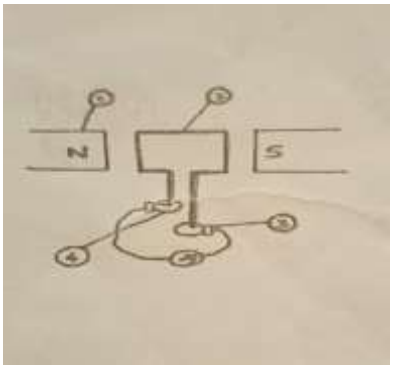
(a) When the circuit is switched on which circuit shows the bulb gives a light with low intensity?

(b) Explain the reason?

(c) Which circuit does not shows a varying magnetic field around the solenoid?

(d) Name a device which works on this principle?

18) Diagram of AC generator is given



(a) Write down the names of the parts numbered?

(b) State the working principle of this device?

(c) Is the same type of current induced both in the armatures of AC and DC generators. Justify your answer?

19) The current in the primary coil of a transformer is 2A and that of a secondary is 1A current. 500 turns are present in the primary coil

(a) What type of transformer is this?

(b)If 400V is available in the secondary coil of this transformer. What is the voltage in the primary?

(c) Find out the number of turns in the secondary?

UNIT 3

Electromagnetic Induction

Answer key

Part A

1. Generator
2. Rectifier
3. Voice coil
4. Kilowatt hour
5. Inductor
6. Armature

Part B

7. When the strong magnet is used the induced emf increases
When the magnet or solenoid moved in fast the induced emf increases
8. Raise the temperature of the body by massaging
Give artificial respiration
9. Increase the number of turns
Increase the speed of movement of the coil or magnet
10. Armature is very heavy to rotate if the armature is used as a stator we can eliminate graphite brushes and avoid spark in between graphite brushes and slip rings.
11) (a) current increases
(b) MCB,ELCB
(c) if the body comes into contact with an electric connection electricity flows to the earth through Earth wire
12) (a) A - AC
B - Battery DC
C - DC
(b) AC current
Direction changes
emf increases and decreases

DC current
Uni-directional
emf increases and decreases

13) (a) LED will glow
(b) mutual induction
(c) when the strength of the current in one of the the two adjacent coils changes the magnetic field around also changes as a result of these an emf is induced in the secondary coil

Part D

14) (a) B
(b) electromagnetic induction
(c) generator

15) (a)230V
(b) voltage and intensity of light decreases
(c) again voltage and intensity of light decreases due to strong magnetic field self induction increases

16) (a) phase line and neutral line

(b) transmission of electricity at high voltage
(c) step down transformer
(d)yes, there is 230V potential difference between a face line and earthline.

Part E

17) (a) Figure B
(b) in circuit B , AC is flowing through the circuit and there is an iron core in the solenoid. A varying magnetic field is created and the back emf is formed. This back emf is opposes the current in the circuit.
(c) figure A
(d) Inductor

18) (a) 1. Magnets
2. Armature
3. Brushes
4. Slip rings
(b) electromagnetic induction
(c)Yes, same type of current is induced. AC induced in both the armature of AC and DC generator. The split ring commutator changes the AC into DC in the outer circuit of a DC generator.
19) (a) step up transformer
(b) primary voltage =
$(400\times1)\div2$
= 200V
(c) Number of turns in secondary = $(400\times500)\div200$
= 1000 turns

UNIT- 4
REFLECTION OF LIGHT

SCORE 1 QUESTIONS

1.Using the relation in the first word pair complete the second

a. Image formation : Regular reflection

No image formation : .....

b. Plane Mirror : Regular reflection

Spherical Mirror : .....

c. Convex mirror : Rear-view mirror

Concave Mirror : .....

d. Focus of concave mirror : Negative

Radius of curvature of convex mirror : .....

e.Head mirror : Concave mirror

Reflector of head lights : .....

2. Find the odd one and give reason

a. Dressing mirror, Rear-view mirror, Head mirror, Rough wall

b. Reflector in head light,Rear-view mirror,Head mirror,Make up mirror

c. Magnification between 0& 1, Magnification -3,

Magnification 1, Magnification between -1 & 0

d. Magnification -0.25, Magnification 0.15,

Magnification 2, Magnification -3

3. In which type of reflection parallel light rays are reflected parallelly?

4. During day time sunlight can spread in a room.Which type of reflection is this?

5. Scattering of sunlight is a type of .....reflection .

6. Which of the following has the highest field of view?

(Shaving mirror, Head mirror,Dressing mirror, Rear-view mirror)

7. Where does the object be placed in front of a concave mirror to get an erect image?

8. The postion of image formed by a convex mirror

(Between the pole & the object, Between P & F,Between F & C,Beyond C)

9. Which of the following does not represent mirror equation?

$f = \frac{UV}{U+V}$, $\frac{1}{V} = \frac{1}{f} - \frac{1}{U}$, $\frac{1}{U} = \frac{1}{f} - \frac{1}{V}$, $\frac{1}{f} = \frac{1}{U} - \frac{1}{V}$

10.The magnification of an image formed by a spherical mirror is -1. Where is the position of the object?

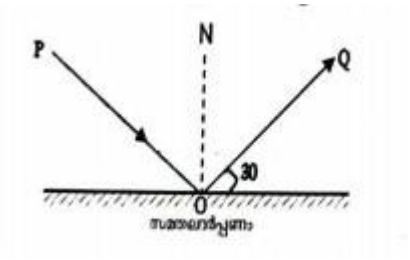
11. A ray of light is incident on a plane mirror at an angle of 60º with the mirror. What will be the angle of reflection?

12.Consider a convex mirror. Where is the origin according to New Cartesian Sign Convention?

SCORE 2 QUESTIONS

1.The person A can see another person B through a plane mirror. B can see A also through the mirror. State the law which is the basis of this fact.

2.Observe the figure and answer the questions



(i) Identify the incident ray.

(ii) What is the measure of angle of incidence?

3. The image formed by a concave mirror has the same size as that of the object. If the object is at a distance of 3 m from the mirror, what is its focal length?

4.The images formed by a mirror are always within 10 cm on the other side

(a) Which type of mirror is this?

(b) What is its focal length?

5. As the distance of an object from the mirror decreases the size of the image increases. When the object comes within 15 cm from the mirror, the nature of the image also changes.

(a) Which type of mirror is this?

(b) What is its focal length?

6. An object is placed at a distance of 1 m from a spherical mirror . An image is formed 2 m away from the mirror on the same side.

(a) What is the focal length of this mirror?

(b) What is its radius of curvature?

7.(a) What is meant by magnification of an image?

(b) What does its sign indicate?

8. Identify and write the correct statements from the following

(i) Radius of curvature is half the focal length.

(ii) The magnification of the image formed by a convex mirror is always between 0 and 1.

(iii) The images in a convex mirror are always closer to it but they appear as away from it.

(iv) The magnification of the images formed by a concave mirror is always negative.

9. “Objects in the mirror are closer than the appear.” What is the reason why this statement is marked on rear view mirrors?

10. Find the type of reflection in the following case

(a) Blue colour of sky and ocean

(b) Reflection at plane mirrors

11.Correct the mistakes if any in the following by making changes in the

underlined portions.

(a) The image formed by a mirror having radius of curvature +48 cm is erect, enlarged and virtual.

(b) Concave mirrors always form virtual images.

12. The magnification of the image formed by a mirror is +1.

(a) Which type of mirror is this?

(b) Which type of mirror can form image having magnification -1?

SCORE 3 QUESTIONS

1. Distingush between regular reflection and irregular reflection

2.Correct the mistakes if any in the following by making changes in the underlined portions.

(a) Plane mirror is the most suitable mirror to be placed at sharp turning of the roads to view vehicles from the other side.

(b) The image formed on a steel ball is always inverted, diminished and real

(c) For a spherical mirror ,the ratio of the product of object distance and image distance to their sum is always a constant.

3.Find the position of the object in the following situations

(a) A concave mirror forms an erect and enlarged image

(b) An ENT doctor examines the throat using a concave mirror.

(c) A concave mirror forms an image at its focus.

4. Field of view is different for different types of mirrors.

(a) What is meant by field of view of a mirror?

(b) Which type of mirror has maximum field of view?

(c) Write a situation where this peculiarity of this mirror is made use.

5.(a) Draw the ray diagram showing the image formation by a plane mirror

(b) Write the peculiarities of the image

6. (a) Complete the following table

Angle between the reflecting planes θ	No. of images n
45°	7
60°	.....(i).....
.....(ii).....	3

(b) Using the completed table establish a relation between θ and n

SCORE 4 QUESTIONS

1. Classify the following statements in a table and give suitable title for each column.

(a)Always form erect, diminished and virtual images

(b) Can form an image having same size as that of the object.

(c) Can form erect ,enlarged and virtual image when the object is between F and P.

(d) Wherever may be the position of the object the image is formed in between P and F.

2. Complete the following table.

Position of the object	Position of the image	Magnification + / -	Nature of image
Between P & F	On the other side	Positive	(a)
At C	At C	(b)	Same size as that of the object,inverted & real
Beyond C	(c)	Negative	Inverted,real and diminished
(d)	Beyond C	Negative	Inverted,real & enlarged

3.Complete the following table correctly.

U (cm)	V (cm)	hi (cm)	ho (cm)	m
–24	–48	–4	+2	(a)
–5	–25	–40	(b)	–5
–4	(c)	(d)	+1	+2
9e)	–25	–8	(f)	–½

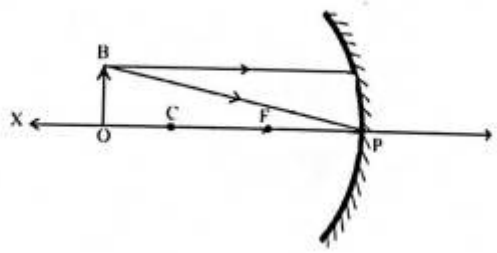
4. The magnification of the image formed by a mirror is between -1/2 and -1/4.

(a) Which type of mirror is this?

(b) Where are the positions of object and image?

(c) Write the nature of the image.

5. (a) Complete the following figure



(b) Using the completed figure prove that m = -v/u

6.A Concave mirror forms the image of an object placed at distance of 25 cm away from it .At that time it is found that uv/(u+v) is 20 cm.

(a) What will be this value {uv/(u+v)} when the object distance is changed to 40 cm?

(b) Write the scientific fact that helped you to arrive at the above answer.

(c) Using this fact form mirror equation

7. Match the following table suitably.

Plane mirror (i)	**Erect,diminished and virtual (a)**	**Head mirror (p)**
Concave mirror (ii)	**Forms erect and enlarged images of very close objects (b)**	**Rear view mirror (q)**
Convex mirror (iii)	**Erect,virtual image having same size as that of object (c)**	**Used by ENT doctors to examine throat . (r)**
Concave mirror (iv)	**Converges distant light rays at the focus (d)**	**To view face (s)**

SCORE 5 QUESTIONS

1.The magnification of the image formed by a mirror is in between -1 and 0

(a) What type of mirror is this?

(b) Where is the position of the object?

(c) Write the position and nature of image.

(d) Where should the object be placed in front of the mirror to get positive magnification?

(e) What is the nature of the image having positive magnification?

2.The magnification of the image formed by a mirror is greater than +1

(a) What type of mirror is this?

(b) When the object distance is 36 cm the magnification is found to be -1. Calculate the focal length of the mirror.

(c) An object having height of 6 cm is placed at distance of 12 cm away this mirror. Find the position of this image.

(d) What is the height of this image

(e) Write the name of another type of spherical mirror which can form an image having positive magnification.

ANSWER KEY

SCORE 1 QUESTIONS

1 a. Irregular reflection

b. Regular reflection

c. Head mirror

d. Positive

e. Concave mirror

2. a. Rough wall .Irregular reflection. In all others regular reflection

b. Rear view mirror. Convex. All others concave.

c. Magnification 1 . This is not suitable for spherical mirrors.

d. Magnification 0.15 .This is of convex mirror. All others are of concave mirror

3.Regular reflection

4. Irregular reflection

5. Irregular reflection

6. Rear-view mirror

7. Between F and P

8. Between F and P

9 1/f=1/u – 1/v

10. At C

11. 30^{o}

12. Pole

SCORE 2 QUESTIONS

1.Laws of reflection – statement

2. (a) PO

(b) 60^0

3. 1.5 m

4. (a) Convex mirror

(b) 10 cm

5. (a) Concave mirror

(b) f=-15 cm

6.(a) -2/3 m

(b) R= -4/3 m

7. (a) Magnification is the ratio of height of the image to height of the object.

(b) Positive magnification- erect and virtual image

Negative magnification- inverted and real image

8. ii &iii

9. A convex mirror always form erect ,virtual and diminished images. The vehicles coming from behind are very small in the mirror. This causes an illusion in our mind that they are away. But they are closer.

10. (a) Irregular reflection

(b) Regular reflection

11. (a) erect ,diminished and virtual

(b) Convex mirrors

12. (a) Plane mirror

(b) Concave mirror

SCORE 3 QUESTIONS

1.

Regular reflection	Irregular reflection
Takes place on smooth surfaces	Takes place on rough surfaces
Parallel rays are reflected parallelly	Parallel rays are not reflected parallelly
Chance of image formation	No chance of image formation

2.(a) Convex mirror

(b) erect, diminished and virtual

(c) Correct statement

3.(a) Between F and P

(b) Between F and P

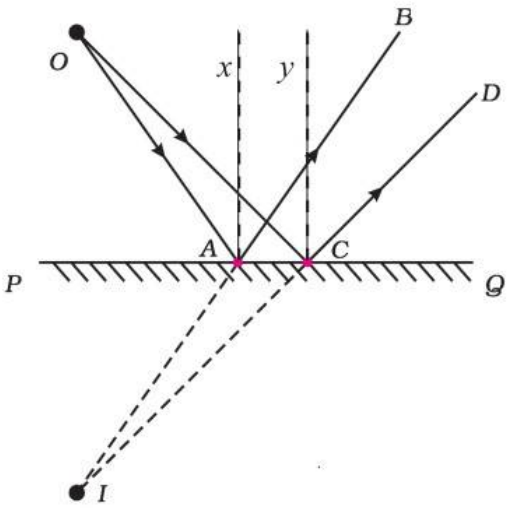
(c) At infinity

4. (a) The range of vision through a mirror is its field of view

(b) Convex mirror

(c) Rear-view mirror

5. (a)



(b) Erect and virtual image having same size as that of the object

6. a. (i) 5

(ii) 90^o

b. $n = 360/\theta - 1$

SCORE 4 QUESTIONS

1.

Concave mirror	Convex mirror
b	a
c	d

2. (a) Erect ,enlarged and virtual

(b) Negative

(c) Between C and F

(d) Between C and F

3.

(a) $= -2$
(b) $= +8$ cm.
(c) $= +8$ cm
(d) $= +2$ cm
(e) $= -50\ cm$
(f) $= +16\ cm$

4. (a) Concave mirror

(b) Position of the object – Beyond C

Position of the image- Between C & F

(c) Inverted, real & deminished.

5. Text Page No.87

6. (a) 20 cm

(b) This value is equal to the focal length of a spherical mirror and it

is always a constant.

(c)

f = uv/(u+v)

1/f = (u+v)/uv

1/f = u/uv + v/uv

1/f = 1/u + 1/v

This is mirror equation.

7. (i)- (c) – (s)

(ii)-(b)-(r)

(iii) – (a)- (q)

(iv)- (d)-(p)

SCORE 5 QUESTIONS

1. (a)Concave mirror

(b) Beyond C

(c) Between C & F . Inverted,real and diminished

(d) Between F & P

(e) Erect and virtual

2. (a) Concave mirror

(b) R = -36 cm

f = R/2 = -36/2 = -18 cm

(c) u =-12 cm, f = -18 cm

v = uf/(u-f) =(-12) x (-18)/[(-12)-(-18)]

= + 36 cm

The object is at a distance of 36 away from the mirror on the other side

(d) m=hi/ho =-v/u

hi = -[v/u] x ho

= - [(+36)/(-12)] x (+6)

= + 18 cm

(e) Convex mirror

Unit 5
Refraction of Light

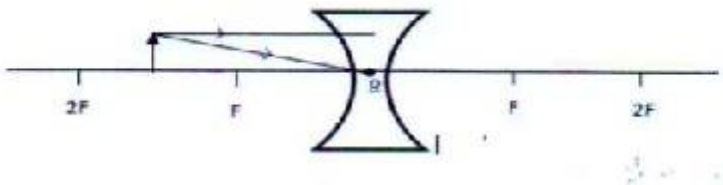
Questions 1-7 carries 1 mark each.

1 Using the relation to the first word pair complete the second
Rear view mirror:Reflection
Optical fibre cable:

2 . If the height of image is given with negative sign as per new Cartesian sign convention,what all pecularities of image can be identified?
3. which one of the following has maximum optical density
(Air,Water,Glass)
4.Which mirror forms an erect and Diminished image?
5.Identify the phenomenon of light which is responsible for the twinkling of stars?
6.A medium of high absolute refractive index has ---optical density.
(High,Low)
7.The power of a lens is +5 D,then the focal length of the lens is --- cm.

Question 8-9 .Carries 2 marks each

8.Observe the figure carefully and an object 'OB'is placed in front of the concave lens.



a)Can the image be screened? Why?
b)If the position of the object is in 2F,where is the position of the image?
9.Some transparent objects of refractive indexes are given below.
Water-1.33,flint glass-1.62
Crown glass-1.52,sunflower oil-1.47
a)what is meant by Refractive index?
b)Arrange the above objects according to their speed of light(Increasing order).

Questions 10-13 .Carries 3marks each.

10.An image is obtained at a distance of 40 cm away from a convex lens when the object placed at the same distance on the opposite side.
a)Write any two characteristics of the image obtained.
b)Write the focal length of the given lens.

11.A convex mirror used for rear -view on a vehicle has a radius of curvature of 3m.If a bus is located at 5m from this mirror .Find the position ,nature and size of the image.

12.The image of a lit candle is produced on a screen using convex lens. Find the position of the object in each of the following conditions.

a) Obtain an image of size equal to the object.
b) Obtain an image smaller than object.
c)Obtain a real image bigger than the object.

13.The magnification of the image formed by a lens is-2.

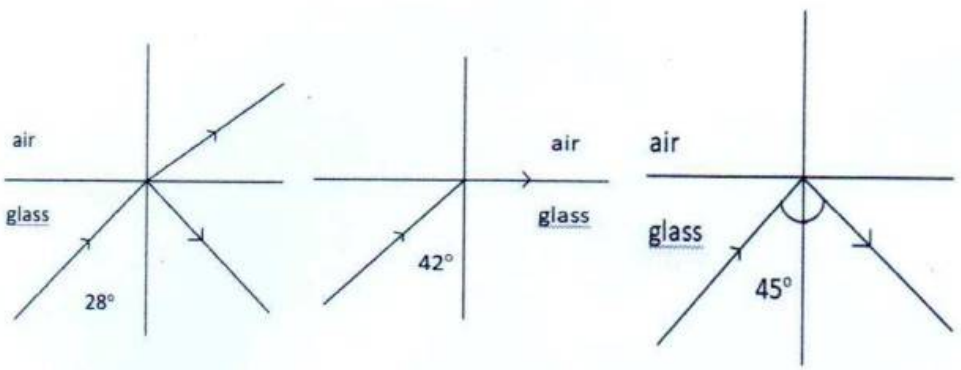
a)What are the peculiarities of the image?
b)Find the position of the object and image when the magnification is -2.
c. Does the magnification of the image formed by this lens always -2? When does a positive magnification obtained if possible?

Questions 14-16.Carries 4 marks each.

14.Complete the following table suitabily.

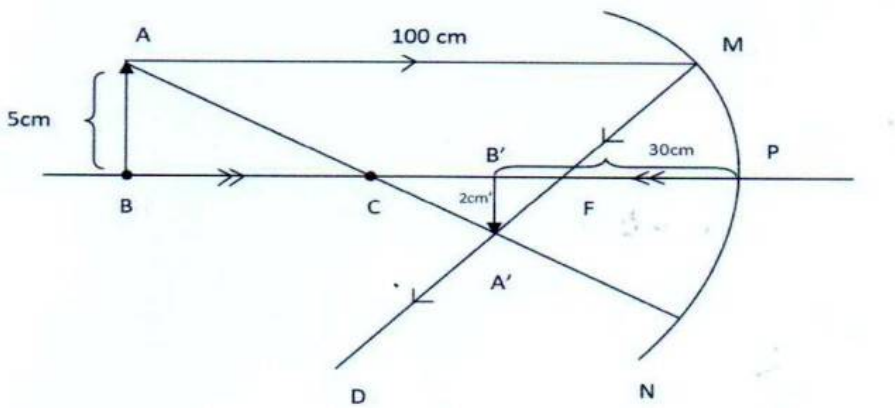
Lens	**Magnification**	**Position of image**	**Size of image**	**Erect/ inverted**	**Real/virtual**
concave	Between 0 and 1	(a)	(b)	Erect	(c)
convex	(d)	On the same side of the object	(e)	Erect	Virtual
convex	Between -1 and 0	(f)	Diminished	(g)	Real
(h)	Below -1	Beyond 2F	Enlarged	Inverted	Real

15.A light ray falls obliquely from glass to air in different angles are shown in the figure.



a)Which diagram represents the critical angle of glass?Write the value of critical angle.
b)Explain the phenomenon total internal reflection.
c) If we replace the medium air with water,is there any change in critical angle of glass?

16.Observe the diagram and complete the folowing using new cartesian sign convention.



a)Height of image.....
b)Height of object.....
c)Distance from the pole to the object.....
d)Distance from the pole to the image....

Answer key-Unit 5

1.Total internal Reflection
2.Real and Inverted
3.Glass
4.Convex
5.Refraction
6.High
7.20cm
8. (a).No
(b)Between F and Lens

9.(a)The ratio of the sine of the angle of incidence to the sine of the angle of refraction (sin i/sin r) will be a constant .This constant is known as refractive index.
(b)Flint glass<crown glass<sunflower oil<water

10.(a) Inverted,Real,same size of the object.
(b) f=uv/u-v=(-40*40)/(-40-40)=-1600/-80=+20cm

11.R=3m,U=-5m,f=R/2=1.5m
v=1.15m
Diminished,Erect

12.(a) At 2F
(b) Beyond 2F
(c)Between F and 2F

13(a)Inverted, Enlarged and Real
(b) The object is in between F and 2F
(c) No
When the object is in between F and P
14.(a) On the same side of the object between F and P
(b) Diminished
(c)Virtual
(d)Greater than 1
(e)Enlarged
(f)Between F and 2F
(g) Inverted
(h) Convex lens

15. (a)Second diagram,42^0

(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.

(c) No

16.(a) -2cm

(b) 5cm

(c)-100cm

(d) -30cm

PHYSICS
Unit 6: Vision And The World Of The Colours

I) Each questions carries 1 mark

1) Which of the following phenomena of light are involved in the formation of a rainbow?
   (a) Reflection, refraction and dispersion
   (b) Refraction, dispersion and total internal reflection
   (c) Refraction, dispersion and internal reflection
   (d) Dispersion, scattering and total internal reflection

2) At noon the sun appears white as
   (a) light is least scattered.
   (b) all the colours of the white light are scattered away.
   (c) blue colour is scattered the most.
   (d) red colour is scattered the most.

3) A student sitting on the last bench can read the letters written on the blackboard but is not able to read / the letters written in his textbook. Which of the following statements is correct?
   (a) The near point of his eyes has receded away.
   (b) The near point of his eyes has come closer to him.
   (c) The far point of his eyes has come closer to him.
   (d) The far point of his eyes has receded away.

4) Which of the following phenomena of light are involved in the formation of a rainbow?
   (a) Reflection, refraction and dispersion
   (b) Refraction, dispersion and total internal reflection
   (c) Refraction, dispersion and internal reflection
   (d) Dispersion, scattering and total internal reflection

5) The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light

   (a) is scattered the most by smoke or fog

   (b) is scattered the least by smoke or fog

   (c) is absorbed the most by smoke or fog

   (d) moves fastest in air---(1)

6) The deflection of light by minute particles and molecules of the atmosphere in all directions is called _____ of light.

   (a) dispersion

   (b) scattering

(c) interference

(d) tyndall effect

7) When white light enters a glass prism from air, the angle of deviation is least for
(a) blue light

(b) yellow light

(c) violet light

(d) red light

8) Which of the following statement is correct?
(a) A person with myopia can see distant objects clearly.
(b) A person with hypermetropia can see nearby objects clearly.
(c) A person with myopia can see nearby objects clearly.
(d) A person with hypermetropia cannot see distant objects clearly.

9) Using the relation from the first pair, complete the other.
Tyndal effect – scattering
Dispersion – ……

II) Each question carries 2 marks each

1) The far point of a myopic person is 80cm in front of the eye.what is the nature and power of the lens required to correct the problem?--
2) Why concave lens always create virtual and erect image of the object?
3) A person suffering from problem in vision,met a doctor. He wrote in his prescription +1.5 D.
a) what has doctor indicated in the prescription?
b) what is the type of lens they prescribed here?

III) Each question carries 3 marks each

1)When Newton's colour disc rotates fast it appears white.
a. Which phenomenon is responsible for this?
b. Define this phenomenon.
c. Write one example related to this phenomenon.

2) The near point of vision of a person is more than 25cm.
a) Name the defect of vision in that person
b) How can we rectify the defect?
c) write any one cause of this defect of vision
3)Make a Newton's disc by painting the constituent colours of white colour of white light in the same order and proportion.
a)In which colour does the disc appear when rotated fast?
b)Give Reason.

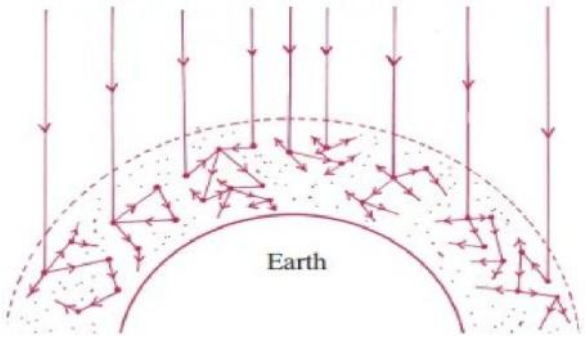
4) Myopia and Hypermetropia are the eye defect of human beings, identify the given statement then separate the reason for Myopia and Hypermetropia.

a. Image is formed behind the retina
b. Images formed in front of the retina.
c. Power of the eye lens decreases
d. Power of the eye lens increases
e. Suitable power of concave lens is used to solve this problem
f. Suitable power of convex lens is used to solve this problem

5) Dispersion of light through water droplets in the atmosphere causes rainbow.
a)Where will be the sun when the rainbow is seen in the west?
b)How many times does a ray of light undergo refraction when it passes through a water droplet?
c)Which colour is seen at the upper edge of the rainbow?----(3)

IV) Each question carries 4 marks

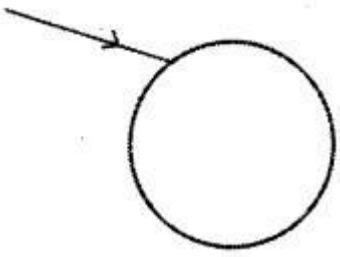
Observe the figure
a)Is the reflection of light here regular or irregular?---(1)
b) what is this phenomenon called?
explain----(1)
c)The telescope -- *Chandra x-ray observatory* is placed in the outer space. What is the advantage of placing it there?---(2)



2) Analyse the following statements and find out the reason behind them.
a. Stars can be seen even in day time while viewed from the moon-----(2)
b. Raindrops falling down during rain appear like a glass rod.---(2)

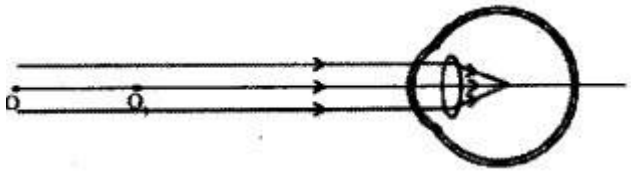
3) A 14- year old student is not able to clearly see the question written on the blackboard at a distance of 5 m from him
a) Name the defect of vision he is suffering from
b) Name the type of lens used for correct this defect
c) Name two possible causes of this defect

4) The figure shows a ray of light falling obliquely on a drop of water in atmosphere.



a) Copy the diagram and complete it show-ing the internal reflection and refractions.
b) How does the sunlight appear as rainbow in water droplets.

5) The image formation of a defected eye is given here

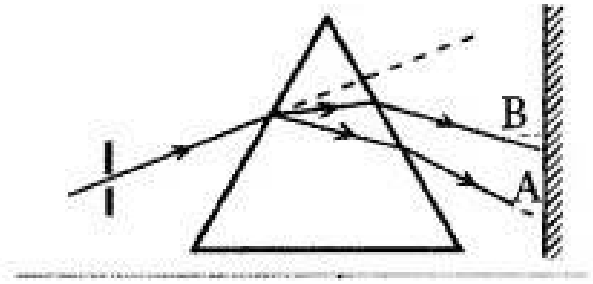


a. In which position images formed on a normal eye?
b. What is this eye defect?
c. How to solve this defect? Draw the diagram.

V) Each question carries 5 marks

1) Write reasons for the following
a) During sunset one might have noticed that the Western horizon become reddish
b) Yellow colour has been given to the light of fog lamps
c) stars can be seen even in day time while viewed from the moon.

2) Observe the figure



a. Which are the colours formed on the sc-reen?
b. Explain the phenomenon that causes the formation of array of colours
c. Which are the colours denoted by ‘A’ and ‘B’?
d. Which colour deviates the most?
e. Which colour deviates at least?

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PHYSICS
UNIT 6
Answer key
I. 1.c
2.a
3.a
4.c
5.b
6.b
7.d
8.c
9.Refraction
II 1. P=1/f
= 1/0.8. = -1.25D
Concave lens

2. Because refracted ray do not actually intersect to each other. It appears to intersect and images formed on the same side of the lens.

3.a. Power of lens is +1.25D
concave lens
III.1.a. Persistance of vision
b. When a person views an object, its image remains in the retina of the eye for a time interval of 0.0625 s
c. Torch rotated rapidly appears as an illuminated circle.
2.a. Hypermetropia
b. Concave lens
c. Diminishing size of the eyeball.
3.a. White
b. Persistance of vision.
4.Myopia-----b,d,e
Hypermetropia------a,c,f
5.a. East
b. 2times
c. Red
IV.1.a. Irregular
b. Scattering
c. Scattering is the partial and irregular reflection of light when it strikes on objects on its path.
2.a. There is no scattering for the light around the moon since there is no atmosphere around it. Hence the sky of moon appears dark. So stars can be seen even in daytime.
b. Raindrops come down faster during rain. The distance travelled by a drop in 1/16 of a second appears like a glass rod due to persistence of vision.

3.a..Myopia
b. Concave lens
c. *Enlarged size of the eyeball.
*power of lens increases.
4. fig 6.10of text book
b. The rays of light incident on the water droplets must be parallel to the line of vision. Each colour ray emerging from the water drop makes a definite angle from 40.8° to 42.7°. Red makes the higher

angle of 42.7° and violet makes a lower angle of 40.8°. Hence red colour is seen at the outer edge and violet colour at the inner edge. The other colours are seen in between depending on their wavelengths. All the water droplets of the same colour appear to be in a same arc of a circle.

5.a. Retina

b. Myopia

c. Using concave lens

diagram.

V. 1.a. During sunset, the sunlight travels maximum distance through the atmosphere to reach in our eyes. So red also undergo scattering. So the horizon appears red.

b. Since yellow colour has higher wavelength it can travel a long distance through fog and dust without scattering.

2.a. VIBGYOR

b. Dispersion---- definition

c. A--Violet

B--Red

d. Violet

e. Red

PHYSICS 2022

UNIT 7

ENERGY MANAGEMENT

1) Which of the following is not a fossil fuel? 1
[coal,LPG,Hydrogen,Petroleum]

2) The main consitituent of LPG is 1

3) The principle used for making hydrogen bomb is 1

4) Write the merits and demerits of wind energy 2

5) Have you ever noticed the numbers and letters such as B26 marked on a coking gas cylinder?
a) What does it mean?
b) If it is marked as C22, what will it indicates. 2

6) Hydrogen has very high calorific value.
a) Hydrogen is a fuel with high calorific value,but it is not used as a domestic fuel.Why?
b) Which are the instances where hydrogen is used as a fuel? 2

7) What are the drawbacks of partial combustion? 3

8) Write 3 devices that can be used at home to reduce energy consumption? 3

9) Energy obtained from nucleus is called nuclear energy.
a) What are the different methods by which the energy is produced from the nucleus?
b) What are the process that takes place in nuclear power station? 4
c) Name the pollution caused by the presence of radio active substances and radiation in water ,air and enviornment?
d) Write any two precaution to be taken during nuclear disaster occur?

10) Classify the following into Green energy and Brown energy
[Tidal energy,Thermal power plant,Wind mill,
Hydro electric power plant,Nuclear power station 4
Solar panel,Diesel engine]

11) Match the following 5

A	B	C
Hydro electric power station	Nuclear energy to electrical energy	Tarapur ,Koodankulam
Thermal power station	Potential energy to electrical energy	Moolamattom,Pallivasal
Nuclear power station	Chemical energy to electrical energy	Nayveli,Kayamkulam

PRASANTH
SKVHS
Kuttemperoor

ANSWER KEY

1) Hydrogen
2) Butane
3) Nuclear fusion
4 Merit...
Renewable
Environment friendly
Demerit...
This can be established at those place where wind is available for most time of year.
The expense to establish a wind mill is very high

5) a) It denotes the expiry date
b) C indicate the expiry month is from july to september and 22 indicate the expiry year of cylinder is 2022

6) a) Hydrogen is highly inflammable and explosive.
It is also difficult to store and transport
b) In rockets and space vehicles

7) Fuel loss , Economic loss, Wastage of time

8) Hot box,Pressure cooker, Energy efficient oven

9) a) Nuclear fusion ,Nuclear fission
b) In nuclear reactor ,nuclear energy is used to heat waterto make steam at high temperature and pressure.The force of steam is used to turn the turbine to generate electricity
c) Nuclear pollution
d) Shift out to safe place,
strictly follow the direction from concerned authorities

10)

Green energy	Brown energy
Wind mill	Thermal power plant
Solar panel	Nuclear power station
Hydro electric power plant	Diesel engine

11)

A	B	C
Hydro electric power station	Potential energy to electrical energy	Moolamattom,pallivasal
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