DISTRICT PANCHAYATH KASARAGOD

EQUIP 2024

(Educational Quality Improvement Programme for class ten)

Student Support Material for Class X

PHYSICS

English Medium

DIET KASARAGOD

EQUIP 2024

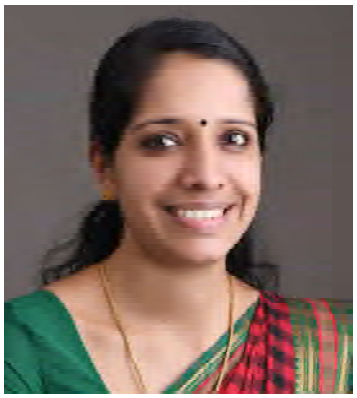
Chief Co-ordinators	:	**Nandikeshan N.** Deputy Director Education, Kasaragod **Dr. Raghurama Bhat K.** Principal, DIET Kasaragod
Co-ordinator	:	**Madhusoodanan V.** Lecturer, DIET Kasaragod
Resource Team		
Physics	:	Junaid, GHSS Alampady Bindhu M., CJHSS Chemnad Jyothilakshmi T.A., KMVHSS Kodakkat Nasrul Islam, GVHSS Mogral
DTP Layout	:	**GS Infotech**, Vidyanagar, Kasaragod.

ആശംസ

വികേന്ദ്രീകൃത ആസൂത്രണത്തിലൂടെയും നിർവ്വഹണത്തിലൂടെയും കേരളത്തിലെ ആരോഗ്യ വിദ്യാഭ്യാസ മേഖലകളെ ദേശീയ തലത്തിൽ ഒന്നാമതെത്തിക്കാൻ നമുക്ക് കഴിഞ്ഞിട്ടുണ്ട്. ഈ നേട്ടങ്ങൾ കൈവരിക്കാൻ പ്രാദേശിക ഭരണകൂടങ്ങൾ സ്തുത്യർഹമായ പങ്കുവഹിച്ചു. ദേശീയ സംസ്ഥാനതല പഠനങ്ങൾ നമ്മുടെ കുട്ടികളുടെ പഠനനിലവാരം ഇനിയും ഉയരേണ്ടതുണ്ട് എന്ന സൂചനയാണ് നൽകുന്നത്. പഠനവിടവുകൾ പരിഹരിക്കുന്നതിനുവേണ്ടി കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ പൊതുവിദ്യാഭ്യാസ വകുപ്പും കാസർകോട് ഡയറ്റും ഒത്തുചേർന്ന് നടപ്പാക്കുന്ന **'എക്വിപ്പ്' (EQUIP)** പഠനപരിപോഷണ പരിപാടിക്ക് എല്ലാ പിന്തുണയും ഉറപ്പുതരുന്നു. പന്ത്രണ്ടാം ക്ലാസിലെ കുട്ടികൾക്കുവേണ്ടി ആദ്യമായാണ് ഇത്തരത്തിലൊരുദ്യമം. പൊതുപരീക്ഷകളെ അഭിമുഖീകരിക്കുന്ന പത്തും പന്ത്രണ്ടും ക്ലാസിലെ കുട്ടികളുടെ പഠനപ്രവർത്തനങ്ങളുടെ മികവിന്റെ അടയാളമായി മാറുകയാണ് വാർഷിക പരീക്ഷകൾ. അറിവിന്റെ തെളിമയോടെ ഓരോ വിദ്യാർത്ഥിക്കും പരീക്ഷ എഴുതാൻ കഴിയണം. വിദ്യാർത്ഥികളുടെ ജീവിതത്തിലെ ഏറ്റവും പ്രധാനപ്പെട്ട പരീക്ഷകൾക്ക് വേണ്ടി തയ്യാറാക്കിയ പഠനപിന്തുണാസാമഗ്രിക്ക് എല്ലാവിധ ആശംസകളും നേരുന്നു. നന്നായി പഠിക്കുക. പരീക്ഷയെ സധൈര്യം നേരിടുക. തളരാതെ മുന്നോട്ട്. വിജയം നിങ്ങളോടൊപ്പമുണ്ട്. ആശംസകൾ.

ശ്രീമതി ബേബി ബാലകൃഷ്ണൻ
ജില്ലാ പഞ്ചായത്ത് പ്രസിഡന്റ്
കാസർകോട്

ആശംസ



കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ ജില്ലയിലെ പൊതുവിദ്യാഭ്യാസ മേഖലയെ ശക്തിപ്പെടുത്തുന്നതിന് നിരവധി പ്രവർത്തനങ്ങളാണ് നടന്നുവരുന്നത്. പൊതു വിദ്യാഭ്യാസ മേഖലയെ പൂർവ്വാധികം കരുത്തോടെ നാം മുന്നോട്ട് നയിക്കുകയാണ്. ഈ ഘട്ടത്തിലാണ് കാസർകോട് ജില്ലാ പഞ്ചായത്തും, പൊതുവിദ്യാഭ്യാസ വകുപ്പും, വിദ്യാഭ്യാസ പരിശീലന കേന്ദ്രവും (DIET) പത്താം ക്ലാസ്, പ്ലസ്ടു വിദ്യാർത്ഥികളുടെ പഠനവിടവുകൾ പരിഹരിക്കുന്നതിനും ആത്മവിശ്വാസത്തോടെ പൊതുപരീക്ഷയെ നേരിടാൻ അവരെ പ്രാപ്തരാക്കുന്നതിനും വേണ്ടി പഠനപരിപോഷണ സാമഗ്രി തയ്യാറാക്കുന്നത്. നിരന്തരമായ ഇടപെടലിന്റെ തുടർച്ചയായി ഈ വർഷം ആദ്യമായിട്ടാണ് പ്ലസ്ടു വിദ്യാർത്ഥികൾക്കുവേണ്ടി ജില്ലാ പഞ്ചായത്ത് പിന്തുണാസാമഗ്രി തയ്യാറാക്കുന്നത്. പ്രധാനപ്പെട്ട ആറ് വിഷയങ്ങളിലാണ് ഈ വർഷം തയ്യാറാക്കുന്നതെങ്കിലും അടുത്തവർഷം മറ്റു വിഷയങ്ങളിലും കുട്ടികൾക്ക് പിന്തുണ നൽകാൻ കഴിയുമെന്ന് പ്രതീക്ഷിക്കുന്നു. കുട്ടികളുടെ അക്കാദമിക മികവ് ഉറപ്പുവരുത്തിക്കൊണ്ട് മികച്ച ഗ്രേഡുകൾ നേടാൻ അവരെ സജ്ജമാക്കാൻ '**എക്വിപ് 2024**' എന്ന പേരിൽ തയ്യാറാക്കിയ ഈ പദ്ധതിക്ക് കഴിയട്ടെയെന്ന് ആശംസിക്കുന്നു.

സ്നേഹപൂർവ്വം

അഡ്വ. സരിത എസ്.എൻ.
ആരോഗ്യ-വിദ്യാഭ്യാസ സ്ഥിരം സമിതി
അധ്യക്ഷ, ജില്ലാ പഞ്ചായത്ത്,
കാസർകോട്

ആശംസ

ജില്ലയിലെ അക്കാദമിക പ്രവർത്തനങ്ങളെ ഏകോപിപ്പിച്ച് മുന്നോട്ട് നയിക്കുന്ന ഉത്തരവാദിത്തമാണല്ലോ ജില്ലാ വിദ്യാഭ്യാസ പരിശീലന കേന്ദ്രങ്ങൾ (DIET) കാലങ്ങളായി ചെയ്തുവരുന്നത്. മനുഷ്യവിഭവശേഷിയിൽ പരിമിതികൾ ഉള്ളപ്പോൾ തന്നെ പ്രീ-പ്രൈമറി തലം മുതൽ ഹയർ സെക്കൻഡറി തലം വരെയുള്ള മേഖലകളിൽ വിവിധങ്ങളായ പദ്ധതികൾ ആസൂത്രണം ചെയ്യാനും നിർവഹിക്കാനും ഡയറ്റുകൾക്ക് ഇതുവരെ കഴിഞ്ഞിട്ടുണ്ട്. ഡയറ്റ് കാസർകോടിന്റെ നേതൃത്വത്തിൽ പത്താം തരത്തിലെ കുട്ടികളുടെ പഠനപ്രശ്നങ്ങൾ മറികടക്കാൻ കഴിഞ്ഞ കുറച്ച് വർഷങ്ങളായി വിദ്യാഭ്യാസ വകുപ്പ് നടപ്പിലാക്കുന്ന പദ്ധതിയാണ് **EQUIP (Educational Quality Improvement Programme).** അതതു വർഷത്തെ കുട്ടികളുടെ പഠനപ്രശ്നങ്ങൾ പരിഗണിച്ചുകൊണ്ടാണ് പ്രവർത്തനങ്ങൾ ചിട്ടപ്പെടുത്തുന്നത്. ഈ പദ്ധതിയുടെ ഭാഗമായി പത്താംതരത്തിലെയും പ്ലസ്ടുവിലെയും പരീക്ഷയെ അഭിമുഖീകരിക്കാൻ കുട്ടികളെ സഹായിക്കുന്ന വിവിധ വിഷയബന്ധിതമായ ചോദ്യമാതൃകകൾ യൂണിറ്റടിസ്ഥാനത്തിൽ പരിചയപ്പെടുത്താനാണ് ഉദ്ദേശിക്കുന്നത്. ജില്ലാ പഞ്ചായത്തിന്റെ സഹായത്തോടെ മലയാളത്തിലും ഇംഗ്ലീഷിലും കന്നഡയിലും പത്താംതരത്തിൽ ഐ.ടി. ഒഴിച്ചുള്ള എല്ലാ വിഷയങ്ങളിലും പ്ലസ്ടുവിൽ പ്രയാസകരമായ ആറ് വിഷയങ്ങളിലും പുസ്തകങ്ങൾ തയ്യാറാക്കി നൽകാനാണ് ഉദ്ദേശിക്കുന്നത്. ഈ അധ്യയന വർഷം പത്താംതരം/പ്ലസ്ടു പരീക്ഷ എഴുതുന്ന മുഴുവൻ കുട്ടികൾക്കും ഈ പദ്ധതിയുടെ പ്രയോജനം ലഭിക്കുമെന്ന് പ്രതീക്ഷിക്കുന്നു. വ്യത്യസ്ത പഠനവേഗതയും പഠനമികവുമുള്ള എല്ലാ വിഭാഗം കുട്ടികൾക്കും ഈ സാമഗ്രി പ്രയോജനപ്പെടട്ടെ എന്ന് ആശംസിക്കുന്നു. അധ്യാപകരുടെ ആത്മാർത്ഥമായ പിന്തുണയും പ്രോത്സാഹനവും അനിവാര്യമായ ഈ ഉദ്യമത്തിൽ എല്ലാവരുടെയും സഹായ സഹകരണങ്ങൾ പ്രതീക്ഷിച്ചുകൊണ്ട് ഏവർക്കും വിജയാശംസകൾ നേരുന്നു.

ആശംസകളോടെ,

ഡോ. രഘുരാമ ഭട്ട് കെ.
പ്രിൻസിപ്പാൾ
ഡയറ്റ് കാസർകോട്

ആമുഖം

കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ ജില്ലയിലെ പൊതുവിദ്യാഭ്യാസം ശക്തിപ്പെടുത്തുന്നതിന് വ്യത്യസ്തങ്ങളായ നിരവധി പ്രവർത്തനങ്ങൾ നടന്നുവരികയാണ്. അതേസമയം ദേശീയ-സംസ്ഥാന പഠനങ്ങൾ നമ്മുടെ ജില്ലയിലെ കുട്ടികളുടെ പ്രകടനം ഇനിയും മെച്ചപ്പെടേണ്ടതുണ്ട് എന്ന സൂചനയാണ് നൽകുന്നത്. ഈ പശ്ചാത്തലത്തിലാണ് ജില്ലയിലെ പൊതുവിദ്യാലയങ്ങളിൽ നിന്ന് 2023-24 അധ്യയനവർഷം എസ്.എസ്.എൽ.സി., പ്ലസ്ടു പരീക്ഷകൾ അഭിമുഖീകരിക്കുന്ന കുട്ടികൾക്ക് പഠനപിന്തുണ നൽകുന്നതിന് ജില്ലാ പഞ്ചായത്തിന്റെയും പൊതുവിദ്യാഭ്യാസ വകുപ്പിന്റെയും സംയുക്താഭിമുഖ്യത്തിൽ വ്യത്യസ്ത വിഷയങ്ങളിൽ പഠനസാമഗ്രികൾ തയ്യാറാക്കേണ്ടതിന്റെ ആവശ്യകത ജില്ലാതല ഉന്നതാധികാര യോഗങ്ങളിൽ ചർച്ചചെയ്യപ്പെട്ടത്. ഇതിന്റെ അടിസ്ഥാനത്തിൽ ഡയറ്റ് കാസർകോടിന്റെ അക്കാദമിക നേതൃത്വത്തിൽ ജില്ലയിലെ മികച്ച അധ്യാപകരെ ഉൾപ്പെടുത്തിക്കൊണ്ട് പത്താംതരത്തിൽ ഐ.ടി. ഒഴിച്ചുള്ള എല്ലാ വിഷയങ്ങളിലും പ്ലസ്ടുവിൽ ഏറ്റവും പ്രയാസമേറിയ ആറ് വിഷയങ്ങളിലും (ഗണിതം, ഫിസിക്സ്, കെമിസ്ട്രി, ഇംഗ്ലീഷ്, അക്കൗണ്ടൻസി, ഇക്കണോമിക്സ്) പഠനപിന്തുണാസാമഗ്രികൾ തയ്യാറാക്കിയിരിക്കുക യാണ്. സ്കൂൾ വിദ്യാഭ്യാസം പൂർത്തീകരിച്ച് ഉന്നത വിദ്യാഭ്യാസമേഖലയിലേക്ക് പ്രവേശിക്കുന്ന പ്ലസ്ടു വിദ്യാർത്ഥികൾക്ക് പഠനപിന്തുണ നൽകുന്ന സാമഗ്രി ജില്ലയിൽ ആദ്യമായാണ് തയ്യാറാക്കുന്നത്. ജില്ലയിൽ നിന്നും പൊതുപരീക്ഷയെ അഭിമുഖീകരിക്കുന്ന മുഴുവൻ എസ്.എസ്.എൽ.സി, പ്ലസ്ടു വിദ്യാർത്ഥികൾക്കും ആത്മവിശ്വാസം വളർത്തുന്നതിനും ഉന്നതവിജയം നേടുന്നതിനും ഈ ഉദ്യമം സഹായകമാകട്ടെയെന്ന് ആത്മാർത്ഥമായി ആഗ്രഹിക്കുന്നു. ഈ പദ്ധതിയെ നെഞ്ചേറ്റിയ പ്രിയപ്പെട്ട അധ്യാപക സുഹൃത്തുക്കൾക്ക് ഈ പുസ്തകത്തെ ഫലപ്രദമായി ഉപയോഗിക്കാൻ കഴിയട്ടെ. എല്ലാവർക്കും വിജയാശംസകൾ.

ശ്രീ. എൻ. നന്ദികേശൻ
ജില്ലാ വിദ്യാഭ്യാസ ഉപഡയറക്ടർ
കാസർകോട്

PHYSICS

SSLC - English Medium

Chapter 1

EFFECTS OF ELECTRIC CURRENT

1. Find the correct relation fill in the blanks (1 marks each)

   a) Safety fuse : heating effect

      Storage battery : .....

   b) Filament lamp : Tungston

      Heating appliance : .....

   c) Joule/Coulomb : volt

      Coulumb/second : .....

   d) Fuse wire : alloy of tin and lead

      Nichrome : .....

   e) Potential defference : volt

      Electric Power : .....

   Concepts: Heating effects, Joules law, $H=I^2Rt$, $V=IR$, heating coil, Nichrome, Safety fuse

2. a) Which material is used for making heating coil? Write its characteristics. (2)

   b) Is it possible to make filament using this metarial? why? (2)

   c) What is the function of safety fuse? (1)

   d) Which are the circumstance cause high electric current in the circuit? (1)

   e) What are the precautions to be taken connecting fuse wire in the circuit? (2)

   f) What is mean by amperage? (2)

   Concepts: Incandescent lamp, discharge lamp, CFL, LED

3. a) Which material is used as filament in Incandescent lamp? Write its characteristics. (1)

   b) Why is filament lamp filled with nitrogen gas? (2)

   c) What are the advantages of using LED bulbs instead of these bulbs? (2)

   d) Describe the working of discharge lamp. (2)

   e) Write the full form of LED. (1)

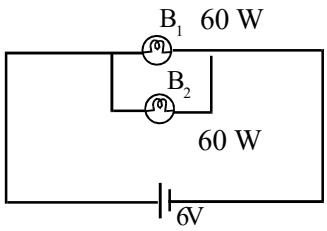
f)

Part of LED	Use
Heat sink	
Power supply board	
Base unit	
Printed circuit board	

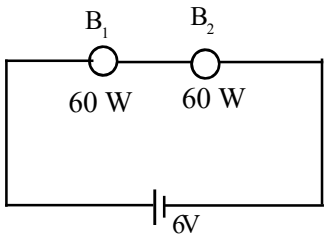
(4)

Concepts : Resister in series and parallel, electric power

4.



(A)

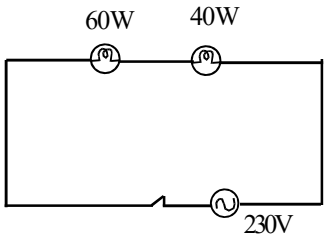


(B)

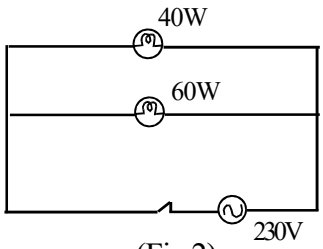
a) The bulb in which circuit glows with greater intensity? (1)

b) What is observed if one of the bulb is removed from both circuits? Justify your answer. (2)

5.



(Fig. 1)



(Fig 2)

a) Which bulb in the figure 1 glows with more intensity? (1)

b) Which bulb in the figure 1 glows with more intensity? (1)

c) Which type of figure is using for domestic circuit? (1)

6. A bulb is rated as 40W, 230V. What is the power produced by this bulb when using 115V? (2)

Answer Key

1. a) Chemical effect

   b) Nichrome

   c) Ampere

   d) Watt

2. a) Nichrome

   - High resistivity
   - High melting point
   - Low thermal radiation
   - Ability to remain in hot condition for a long time without oxidation.

   b) No

   In hot condition Nichrome doesn't give bright light.

   c) Protect the circuit, equipment and building from hazards caused by excessive current

   d) Short circuit, overloading.

   e) Fuse wire should be in series combination

   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 the fuse wire of proper amperage.

   f) It is the ratio of power and voltage.

3. a) Tungsten

   - High resistivity
   - High melting point
   - High ductility
   - Gives white light

   b) To prevent the oxidation of tungsten filament used in the bulb and to increase its longivity and efficiency.

   c) - Low power
   - There is no environmental pollution as it does not contain mercury.
   - It hasn't filament, so there is no loss of energy in the form of heat.

d) Gas molecules attain a higher energy level, when a high voltage is applied. Molecules lose their energy in the form of rays, then returns to lower energy levels and acquire stability.

e) Light Emitting Diode

f)

Part of LED	Use
Heat sink	It absorbs heat
Power supply board	AC converted to DC
Base unit	Connects bulb to holder
Printed circuit board	To connect LED

4. a) A

   b) Second bulb in the circuit A glows. Second bulb in the circuit B doesn't glows.

5. a) 40 W

   b) 60 W

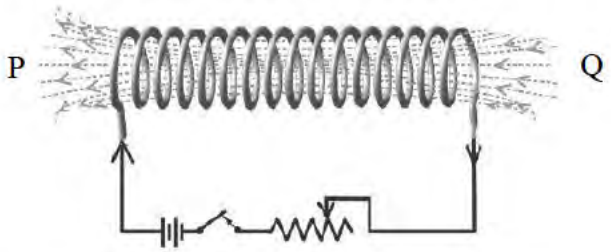
   c) Figure 2

6. 10 W (When the voltage is halved the power is reduced by $\frac{1}{4}$)

Chapter 2

MAGNETIC EFFECT OF ELECTRIC CURRENT

1. A magnetic field is produced around a current carrying conductor.



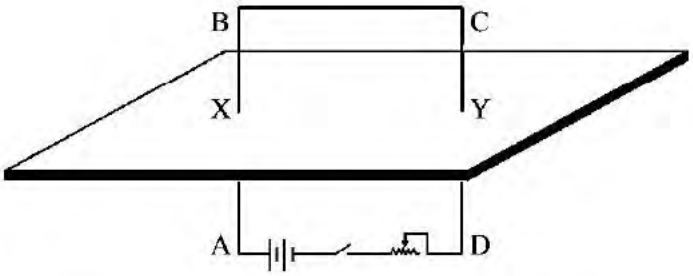
Observe the figure.

a) If the current flows in the clock wise direction at the Pend of the Solinoid then what will be the Polarity there?

b) If the direction of current flow through a Solenoid is reversed and the north pole of a bar magnet is brought near the end Q, will it attract? why?

c) What are the factors affecting the strength of the magnetic field of a Solenoid carrying current?

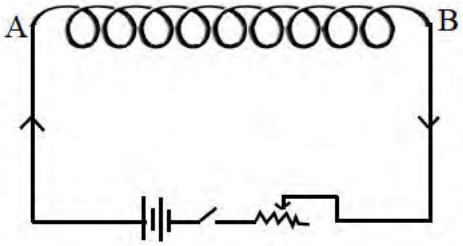
2. Observe the figure.



a) Find the direction of magnetic field lines at X and Y (2)

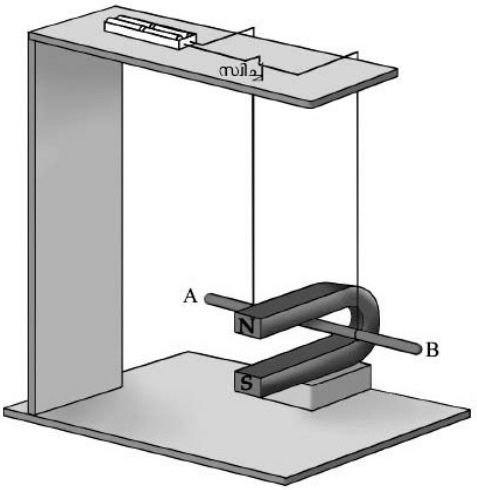
b) Which rule helps to find the direction? (1)

3.



What is the change in the magnetic field strength if the ends of solenoid AB are strectched?

4. Observe figure.



a) If the conductor AB is to move outwards between the poles, the direction of current will be in which of the following?

(From A to B, from B to A)

b) Which law helped to identify this ? State the Law concept.

Answer Key

1. a) North Pole

   b) Repels, when current is reversed at Q North pole is formed.

   c) Increase the No. of turns

   Use soft iron core

   Increase the electric current

2. a) x - Anticlockwise direction

   y - Clokewise direction.

   b) Maxwell's Right hand thumb rule.

3. Magnetic force decreases, since flux density decreases.

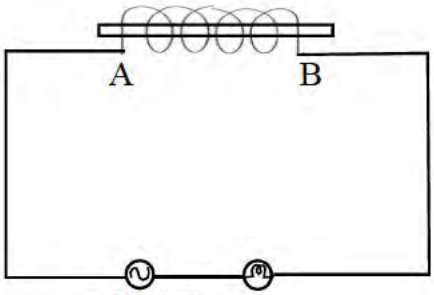
4. a) from B to A

   b) Flemings Left hand rule

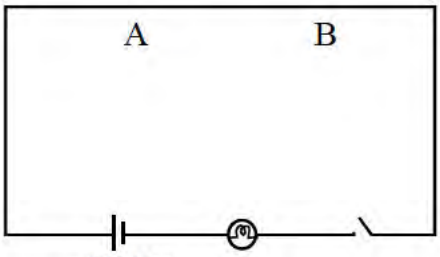
Chapter 3

ELECTRO MAGNETIC INDUCTION

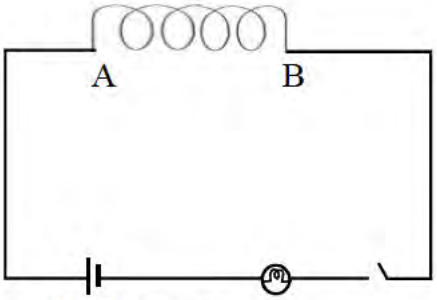
1.



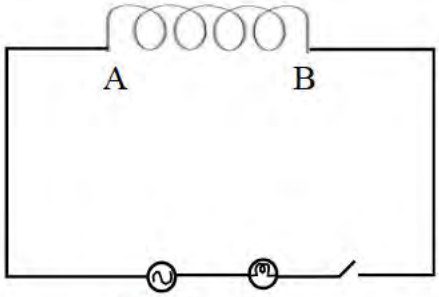
(A)



(B)



(C)



(D)

Copper wires with same length and same area of cross section are connected between the terminals A and B.

a) In which of the circuits bulbs glow with maximum brightness? (1)

b) In which circuits the bulb glow with maximum brightness? Why? (2)

2. a) Where the step up transformer is used? In power transmission or distribution process? why? (2)

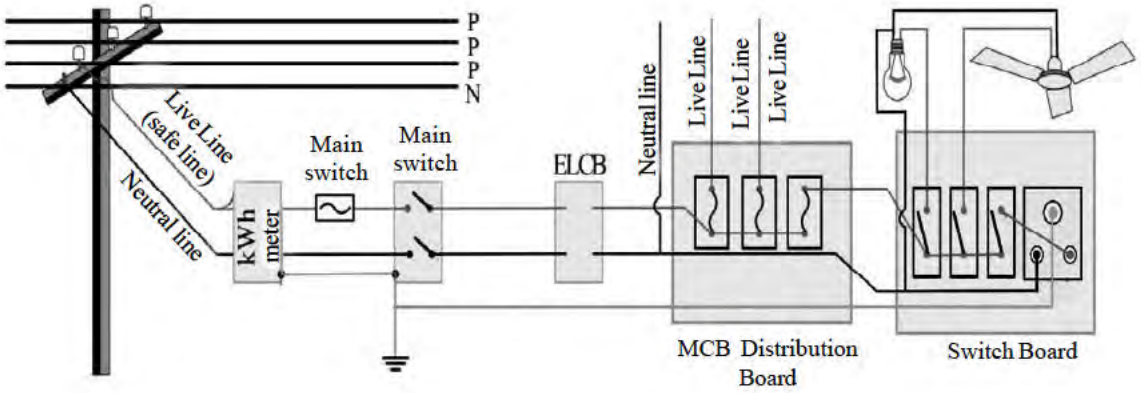
b) Give the equation used to measure the transmission loss. (1)

c) How the transmission loss can minimize? (2)

d) Which type of transformer is the distribution transformer? (1)

e) How much is the output voltage of a distribution transformer for house hold purpose? (2)

3.



a) What is the function of main switch? (1)

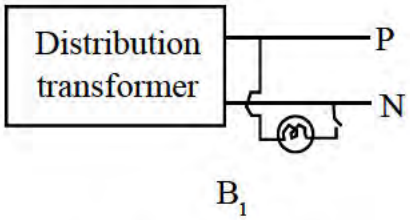
b) Give the full form MCB and ELCB (2)

c) What are the differences between MCB and Fuse? (2)

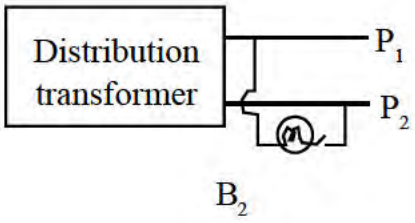
d) Name the device used in modern circuits insteacd of ELCB. (1)

e) What is the function of earthing in wiring? (1)

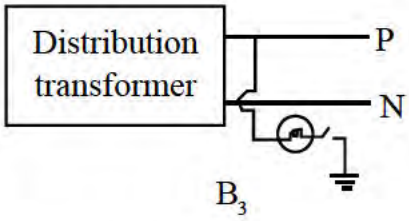
4. The figures given below shows the different modes of connection of a 230V bulb. When switched on, Which bulbs will glow? why? (2)



B_1



B_2



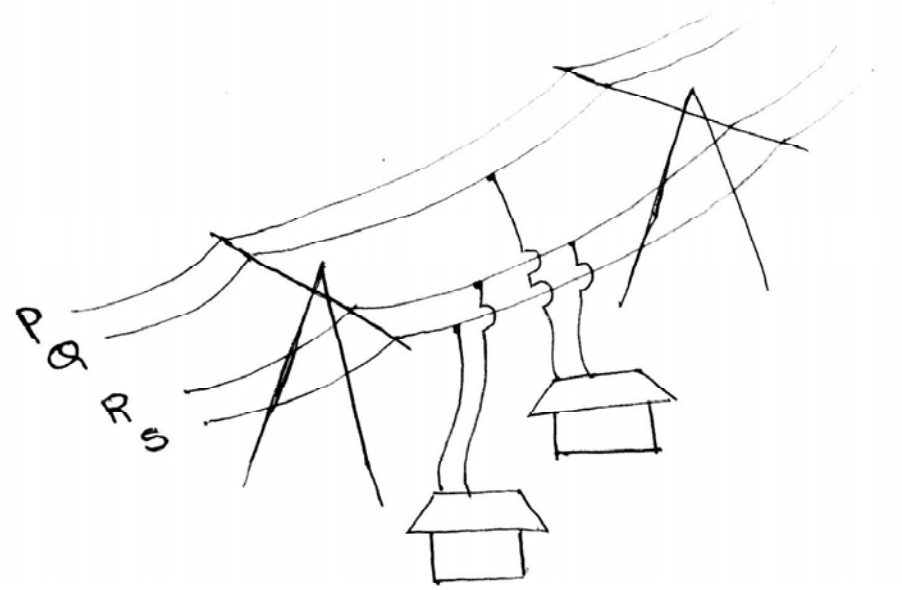
B_3

5. a) How is the earth pin of three pin plug differ from other pins?

b) To which part of the device the earth pin connected?

c) How the three pin plug ensure the safety?

6. Observe the electrical connections given to adjacent house.



a) Potential difference between P and Q is ..... (1)

b) Potential difference between R and S is ..... (1)

c) Potential difference between R and earth is ..... (1)

Answer Key

1. a) B and C

   b) A. Self induction is more due to the presence of soft iron core.

2. a) In power stations. To minimize transmission loss.

   b) $H=I^2Rt$

   c) by decreasing current and increasing voltage by using a step up transformer.

   d) Step down

   e) 230V, 400V

3. a) To control whole circuit

   b) MCB - Miniature Current Breaker

   ELCB - Earth Leakage Circuit Breaker

c)

MCB	FUSE
● Heating and magnetic effect of electricity is used. ● After rectifying the issue, it is enough to switch on the circuit. ● Work automatically.	● Heating effect of electricity is used. ● After rectifying the issue, the circuit can brought to original state by replacing fuse wire. ● When high current flows through the circuit the fuse wire melt and break the circuit.

d) RCCB

e) To provide safety, from the dangerous effects caused by the excessive current flow.

4. B_1 and B_3. These two bullbs will get 230V

5. a) Earth pin is thicker and longer

   b) To metallic body

   c) When current enter into metallic body, it pass into the earth through earth wire. The earth wire is connected to earth pin of three pin plug.

6) a) 400V

   b) 230V

   c) 0V

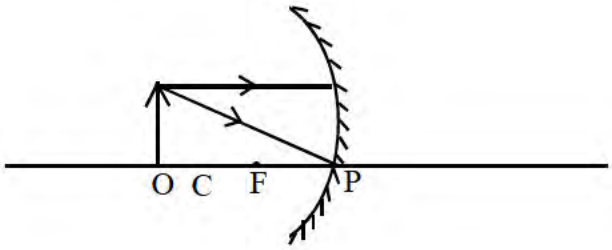
Chapter 4

REFLECTION OF LIGHT

1. Write the correct equation of magnification of mirror. (1)

   ($m = \frac{-v}{u}$, $m = \frac{u}{v}$, $m = \frac{-u}{v}$)

2. Observe the diagram. (2)



   Redraw the diagram and complete it to show the image.

3. Is the image formed by the plane mirror real or virtual? Write an instance when such a mirror gives an inverted image.

4. Magnification of the image formed in the mirror is -1.

   a) Image formed in the mirror is ..... (1)

   (real and inverted, virtual, real and erect, virtual and erect)

   b) 'If the magnification is less than one, then the size of the image will be larger than the object'. State this true or false. (1)

   c) Which type of mirror is used here? (1)

5. An object is placed at a distance of 20cm from a mirror of focal length +5 cm.

   a) Calculate the image distance. (1)

   b) What is the nature of the image formed? (1)

   c) Find the magnification of the image. (2)

6. If the object distance of a spherical mirror is 10 cm, then the magnification of image is -1.

a) This mirror is a ..... mirror. (1)

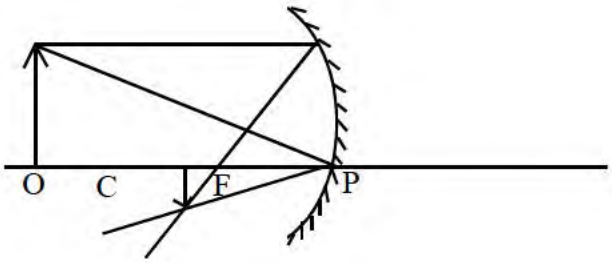
b) write any two properties of this image. (1)

c) If you change the object distance 30 cm, then find the image distance. (2)

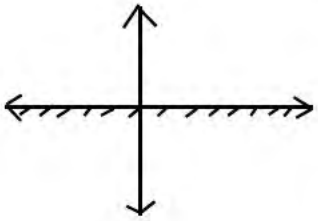
Answer Key

1. $m = \frac{-v}{u}$

2.



3. Image formed in plane mirror is always virtual.



If an object is placed perpendicular to the plane mirror, then image will be inverted.

4. a) real and inverted

   b) False

   c) Concave mirror

5. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

   $\frac{1}{u} = \frac{1}{f} - \frac{1}{u}$

   f = +5 cm u = -20 cm

   $\frac{1}{v} = \frac{1}{5} - \frac{1}{-20}$

   $\frac{1}{5} + \frac{1}{20}$

   $= \frac{20+5}{20x5}$

   $\frac{1}{v} = \frac{1}{4}$

   v = 4 cm

   b) direct, small, virtual

   c) $m = \frac{-v}{u} = \frac{-4}{-20} = \frac{1}{5}$

6. a) Concave mirror

   b) direct and virtual

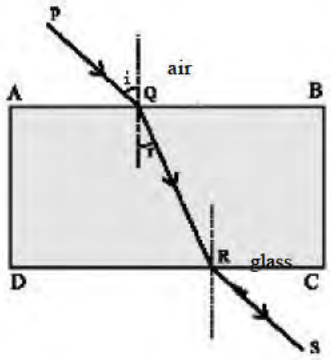
   c) f = -10cm u = -30cm

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$
$$= \frac{1}{-10} - \frac{1}{-30}$$
$$= \frac{1}{-10} + \frac{1}{30}$$
$$= \frac{30-10}{-300}$$
$$= \frac{20}{-300}$$
$$v = \frac{-300}{20}$$
$$= -15cm$$

Chapter 5

PERFECTION OF LIGHT

1. A glass slab is kept on a table. The path of the light from a Laser torch has drawn on a drawing sheet.



1) Which phenomenon of light has drawn here?

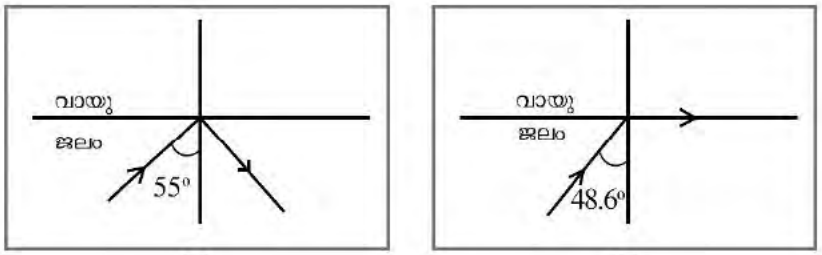
2) What is the reason for this phenomenon?

3) Which are the media through which the light is travelling here?

4) In which medium the speed of light is maximum?

5) What are 'i' and 'r' represents?

2. The following figures represents the total internal reflection.



(a) (b)

1) How much is the critical angle given in the picture?

2) In which medium the critical angle is marked?

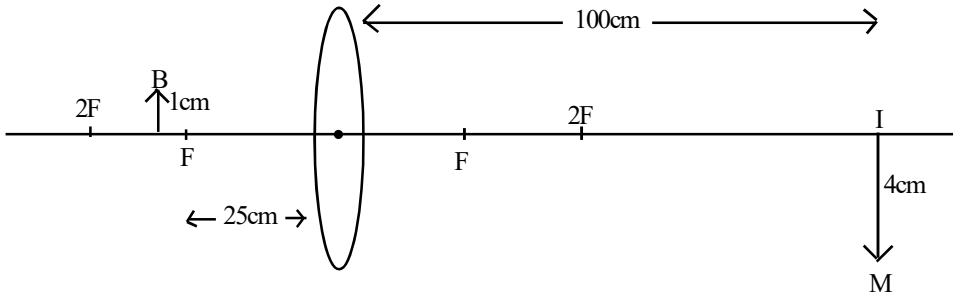
3) Which diagram represents the total internal reflection?

4) What are the conditions for happening total internal reflection in a medium?

3. According to the image formation in a convex lens complete the table.

Position of object	Portion of Image	Nature of Image/Size		
		Real/Virtual	Inverted/erect	Magnified/ Diminished / Same size
at infinity	at F	Real	Inverted	Diminshed
Beyond 2F				
At 2F				
Between 2F and F				
At F				
Between F and Lens				

4. Observe the figure.



1) Using New Cartesian Sign convention find the values.

a) Distance to the object, u = ... cm.

b) Distance to the image, v = ... cm.

c) Height of the object = ... cm.

d) Height of the image = ... cm.

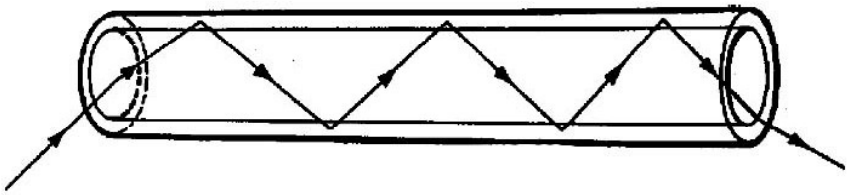
2) Write the equation for finding the focal length of the lense.

3) This equation is names as .....

4) Find the focal length of this lense.

5) If the values of u, v are changed mutually what will be the focal length?

5. The path of the light ray in an optic fibre is given in the figure.



1) Which property of light is depicted here?
2) How this property is using in tele communication field?
3) Findout the practical application of this property of light in our day to day life? And name a device contacted which works using this property?

Answer Key

1. 1. Refraction
   2. Difference in optical density
   3. Air, Glass
   4. Vacuume
   5. i = angle of incidence ; r = angle of refrection

2. 1) 48.6^0
   2) Water
   3) Pic A
   4) a) Light must be travelling from a medium of higher optic density to a medium of mower optic density.
   b) The angle of incidence should be greater than critical angle.

3.

Position of object	Portion of Image	Nature of Image/Size		
		Real/Virtual	Inverted/erect	Magnified/ Diminished / Same size
at infinity	at F	Real	Inverted	Diminshed
Beyond 2F	Between F and 2F	Real	Inverted	Diminshed
At 2F	At 2F	Real	Inverted	Same size
Between 2F and F	Beyond 2F	Real	Inverted	Magnified
At F	Infinity	No image formation	Formation	
Between F and Lens	Behind the object	Virtual	Erect	Magnified

4. 1) a) -25cm

b) +100cm

c) +1cm

d) -4cm

2) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ OR $f = \frac{uv}{u - v}$

3) Lense formula

4) $f = \frac{-25x100}{-25-100}$; $f = \frac{-2500}{-125}$; $f = +20$ cm

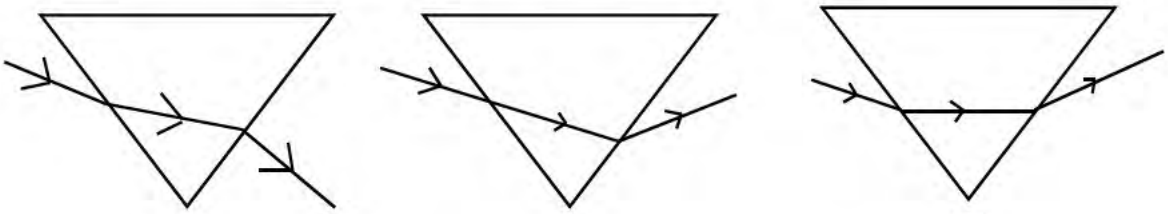
5) $f = \frac{-100x25}{-100-25}$; $f = \frac{-2500}{-125}$; $f = +20$ cm

The focal length of the lens is constant.

Chapter 4

VISION AND THE WORLD OF COLURS

1. Choose the correct figure from the followings. (1)



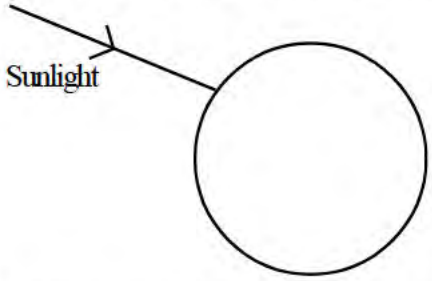
(A) (B) (C)

2. a) When a disc rotated rapidly, it appears white. What are the possible constituent colour in dics? (1)

   b) What will be observation when a torch is rotating rapidly? Name the phenomenon responsible for this. (2)

   c) Give another example for this phenomenon. (1)

3. a) Entering of a sunlight into water drop let is shown below. Complete the figure. (2)



   b) Which are the phenomenon that light undergo during the formation of a rainbow? (2)

4. You are not seen stars during day time, why? (2)

5. a) What is the colour seen at the upper edge of the rainbow? (1)

   b) What is the colour seen at the lower edge of the rainbow? (1)

6. a) Near point of an eye with healthy vision is ..... (1)

   b) Far point of an eye with healthy vision is ..... (1)

7. What is meant by power of accomodation of eye? (2)

Answer Key

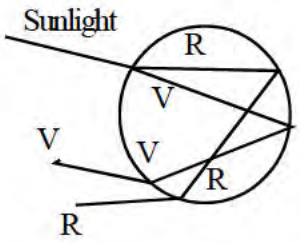
1. C

2. a) RGB or VIBGYOR

   b) appeares as illuminated circle, persistance of vision.

   c) Rain drops are seen like glass rods during raining.

3. a)



   b) Refraction, Dispersion, Total internal reflection.

4. It is due to the scattering of sunlight in atmosphere.

5. a) Red

   b) Violet

6. a) 25 cm

   b) Infinity

7. It is the ability of eye to adjust the focal length of lens by varying the curvature of lens.

Energy Management

1. Match the following.

A	B	C
Satellite	$E = MC^2$	Low air pollution
Einstein	Solar Panel	Atom bomb
Biogas	Nuclear fission	Enriched Uranium
Nuclear Reactor	Nuclear fusion	Hydrogen bomb
Sun	Cowdung	Solar energy $\rightarrow$ Electrical energy

2. Classify the following as Green Energy and brown energy.

a) Hydro electric power station

b) Atomic reactor

c) Diesel Generator

d) Solar cell

e) Tidal energy

f) Thermal Power station

Answer key

1. Satellite $\rightarrow$ Solar Panel $\rightarrow$ Solar Energy $\rightarrow$ Electrical Energy

   Einstein $\rightarrow$ $E = MC^2$ $\rightarrow$ Atom bomb

   Biogas $\rightarrow$ Cowdung $\rightarrow$ Low air pollution

   Nuclear Reactor $\rightarrow$ Nuclear fission $\rightarrow$ Enriched Uranium

2. Green Energy $\rightarrow$ a, d, c

   Brown Energy $\rightarrow$ b, c, f

EQUIP - 2024

SSLC - EXAMINATION SUPPORT MATERIAL

PHYSICS - ENGLISH MEDIUM

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1 Mark Questions

1. Find the odd one from the group. Give Reason.
   (Coke, Coal tar, Peat, Coal gas)
2. What is the reason for the dispersion of light.
   (Scattering, Refraction, Reflection)
3. In our country AC generated in .....voltage.
4. Name the mirror which is used as rear view mirror.
5. Which lens always form small, diminished and virtual image.
6. Moving coil loud speaker is working under ..... principle
7. Which one of the following is not a quality of the LED lamps?
   - Not harmful to the environment
   - High efficiency
   - Loss of energy in the form of heat
   - High longevity.
8. Biogas : Methane LPG : .....
9. If speed of light in one medium is $2x10^8$m/s, what is the refractive index of that medium? (Speed of light in air is $3x10^8$m/s)
10. Find the relation and complete the word pair?
    Electric bulb : Lighting effect ; soldering iron : .....
11. Write the Energy change in electric motor.....
12. What is the frequency of AC generated in India?
13. If radius of curvature of a mirror is 48cm. Then find the focal length of that mirror?

14. If the refracted ray is passing parallel to the surface of seperation of two medium, then what is the angle of refraction?

15. Find the odd one and give reason.

    (Solar energy, fossil fuel, geo thermal energy, wave energy)

16. In which colour does Newton's colour disc appear when rotated fast?

    What property of the eye makes this possible?

17. If size of the image formed by convex lens as same as the size of the object, then what is the magnification?

    (+1, -2, -1, +2)

18. Which part of the appliance is connected to the pin E of the three pin plug?

19. Which of the following is incorrect?

$$\left(P = IR^2,\ P = VI,\ P = \frac{V^2}{R},\ P = I^2R \right)$$

20. From the following which one is not a part of dc motor?

    (Armature, Field magnet, Voice coil, Splitring)

21. Safety fuse works on heating effect of electric current. To which line the fuse is connected?

22. When white light passes through a prism it undergoes dispersion. Which colour deviate more and which colour deviate least?

23. LPG is a colourless odourless gas. Which chemical substance is added for the smell?

24. Which defect of vision can be rectified by using concave lens.

    (Near sightedness, Longsightedness, Presbyopia)

25. Which device is used to bring changes in electric current without loss of power?

    (Resistor, Ammetor, Voltmeter, Inductor)

26. Hydrogen has the more calorific value. What you mean by Calorific value?

27. For a normal vision of human being near point is ..... and far point is .....

28. When electric current through a circuit is reduced to half then,

    Heat produced is ..... times according to Joule's Law.

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

29. Select the wrong statement related to Tungsten filament?

\ a) High Resistivity

   b) High ductility

   c) Low melting point

   d) It can be kept white hot

30. Write the correct relation

    Transformer : Mutual Induction : : Generator : .....

31. Identify the position of object when a convex lens produce real and enlarged image.

    (At 2F, Between F and lens, Beyond 2F, Between F and 2F)

32. Can you guess why red colour has been given to Danger Signals?

33. The full form of LPG is .....

34. Total number of images formed when two plane mirrors are arranged at 120^0

    (2, 1, 3, 4)

35. What is Biomass?

36. How are the Electrical appliances are connected in House hold circuits?

37. Find the correct relation and fill in the blanks.

    Heat : Joule : : Resistance : .....

38. What are the reason for excess current flow through the curcuits?

39. Most abundant fossil fuel on earth is .....

40. Find power of a convex lens of focal length 50cm?

    (+4D, +2D, +5D, +3D)

41. Locate the position of object in order to get virtual, erect and enlarge image when it is kept infront of a concave mirror at,

    (between F and P, Beyond C, At C, Between C and F)

42. Potential difference between 2 phase line is

43. Give a situation in which we can use only solar panels?

44. Find height of image, when an object of height 4 cm, is placed infront of a convex lens of magnification - 2.

45. According to Flemings Left Hand Rule, Fore finger indicate direction of magnetic field, middle finger indicate the direction of....., and thumb indicate the direction of .....?

2 Marks Questions

46. Ten 3Ω resistors are connected in parallel manner. Find the effective resistance of the combination?

47. What is photovoltaic effect ?

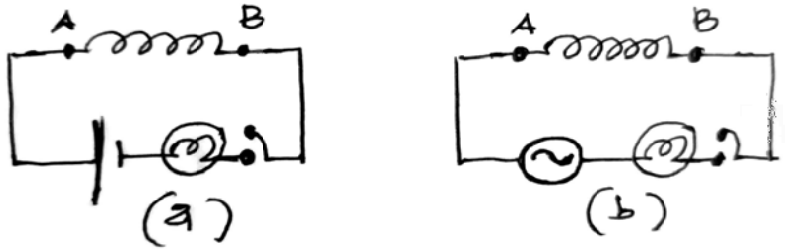
48. How does the earth pin differs from the other pins ?

49. What are the factors influence the magnetic field of a current carrying Solenoid?

50. Raindrops falling down during rain appear like a glass rod. Explain the phenomenon?

51. Calorific value of a fuel marks as 45000KJ/kg" What does it mean? Write any two characteristics of a good fuel?

52. Solenoid of same length and thickness are connected to points A and B in the 2 circuits. Observe the circuits and answer the following questions.

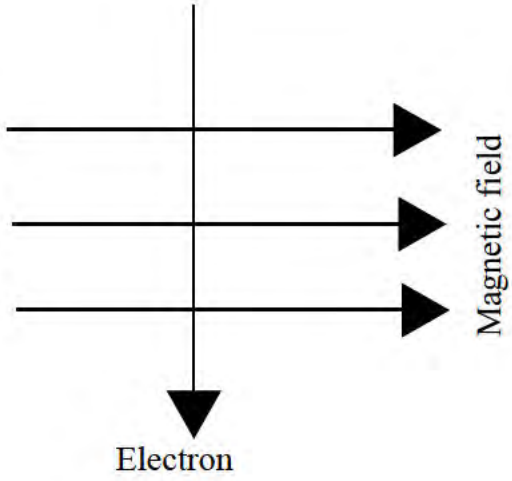


(i) When circuit (a) and (b) are switched ON what changes do you observe in the intensity of light?

(ii) Give its reason?

53. What is the reason for twinkling of star? Explain the phenomenon?

54.



The direction of movement of electrons through a magnetic field is depicted. Find the direction of force felt by electrons? Explain the law use to find the direction of force.

55. Select the correct statements from the following.

(i) Magnification is negative when the image is Virtual and Erect.

(ii) If magnification is greater than one then size of image is greater than object.

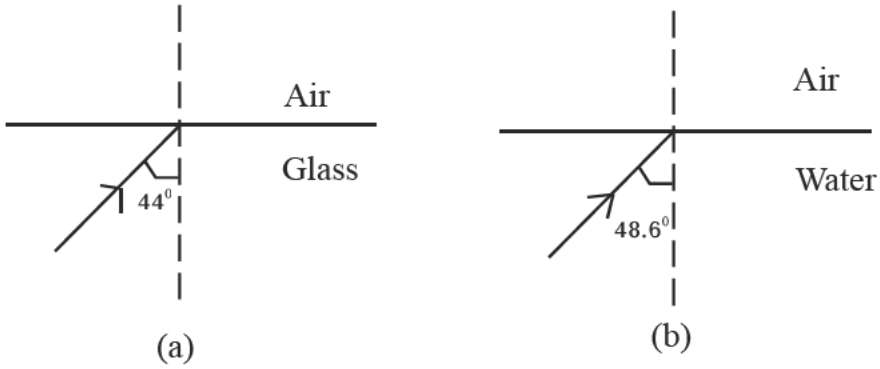
(iii) If magnification is one then size of image and object are same.

(iv) If magnification is positive, then image is inverted and real.

56. What is the advantage of discharge lamp over incandescent lamp?

57. When a pencil is placed in a glass of water, what change you can observe? Explain the phenomenon behind it?

58. Complete the path of rays in fig (a) and (b)



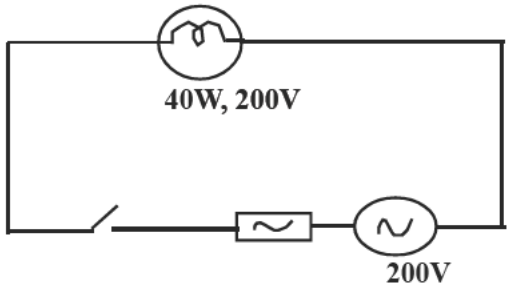
59. a) Explain Energy conversion in Hydroelectric station.

b) Give 2 examples of Hydroelectric power stations.

60. Normally we observe beam of light through the slit of window, door etc. Explain the optical phenomenon behind it?

3 Marks Questions

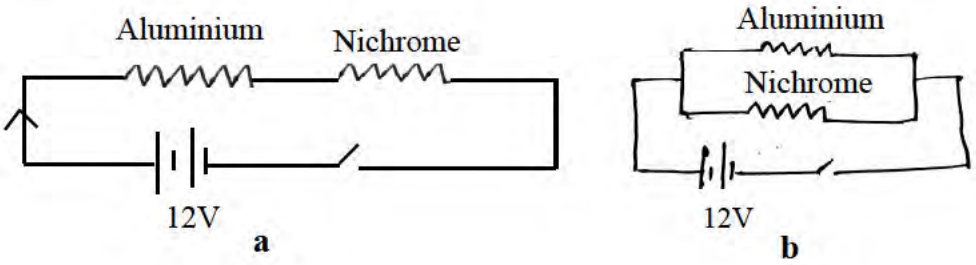
61. Observe the figure.



a) Calculate the amperage of the fuse needed for the circuit. (The amperage of fuses available in market are IA, 1.25A, 1.5A, 2.2A, 5A, 10A etc. (1)

b) If the voltage is droppes to 100V. Calculate the power of the bulb. (2)

62. Observe both the circuit.



a) In figure (a), in which resistar more heat is produced ?
(Aluminium/Nichrome) (½)

b) In figure (b), in which resistar more heat produced ? (½)
(Aluminium/Nichrome) (2)

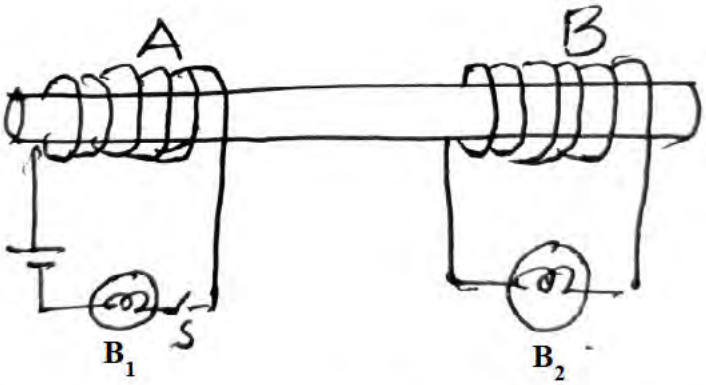
c) Give reason for both

63. a) What is the reason for exerting force on a current carrying conductor placed in a magnetic field ? (1)

b) Write down the factors affecting force on the conductor. (1)

c) Name the principle needed to find the direction of the force. (1)

64. Coils wound around a soft iron core connects two bulbs B_1 and B_2 of 6V. Analyse the figure and answer the questions.



a) If 6V dc is given in the coil A and the switch is on which of bulbs B_1, B_2 will glow? Why? (1½)

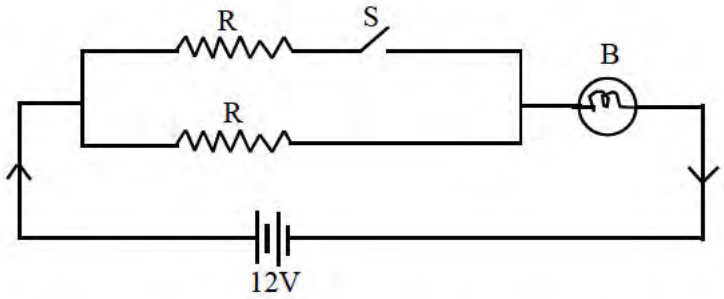
b) If AC is given in the coil A instead of DC, which of the bulb will glow - B_1 or B_2 ? Why ?

65. An inductor is an insulated copper wire wound in a helical shape.

a) What is the use of inductor in a circuit?

b) In circuits resistors and inductors are used for same purpose. Which is more suitable ? Why ?

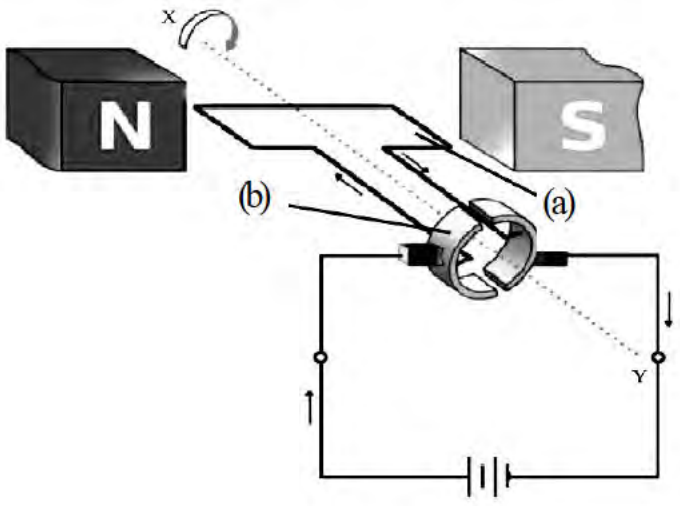
66. Observe the figure.



a) If the switch is ON how will the intensity of bulb change? And if it is in off condition how will the intensity varry? (1)

b) Justify your answer. (2)

67. The figure below shows a DC motor.



a) Name the parts which is marked as (a) and (b)?

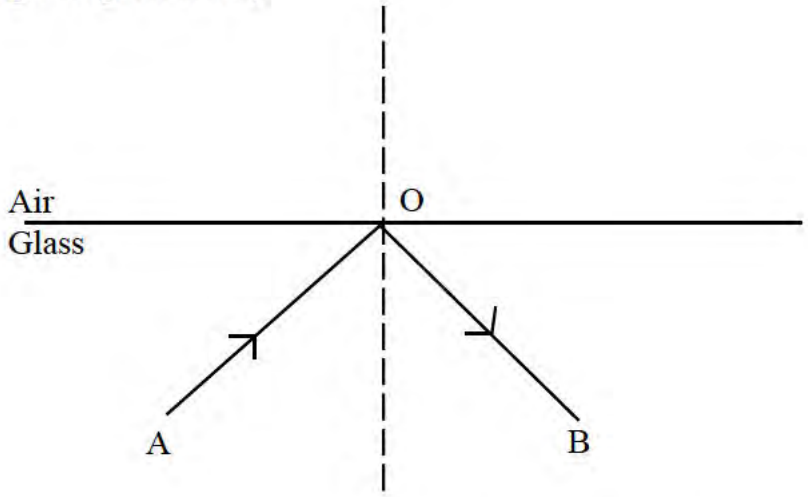
b) What is the function of (b) marked in above figure?

c) Differenciate the working principle of dc motor and dc generator?

68. March the following

A	B
1. Fleming's right hand rule	1. DC motor
2. Slip ring	2. Direction of induced current
3. Split ring	3. Direction of motion of conductor
	4. AC generator

69. Observe the figure.
(Critical angle of glass is 42^0)



a) Here the light ray. AO is reflected as OB in the same medium. Write one circumstance for that type of reflection?

b) Name this phenomenon?

c) If the incident angle is 42^0. What will be the refracted angle?

70. a) Find out the mirror with maximum field of view from the bracket?
(Concave mirror, Convex mirror, Plane mirror)

b) Complete the following table

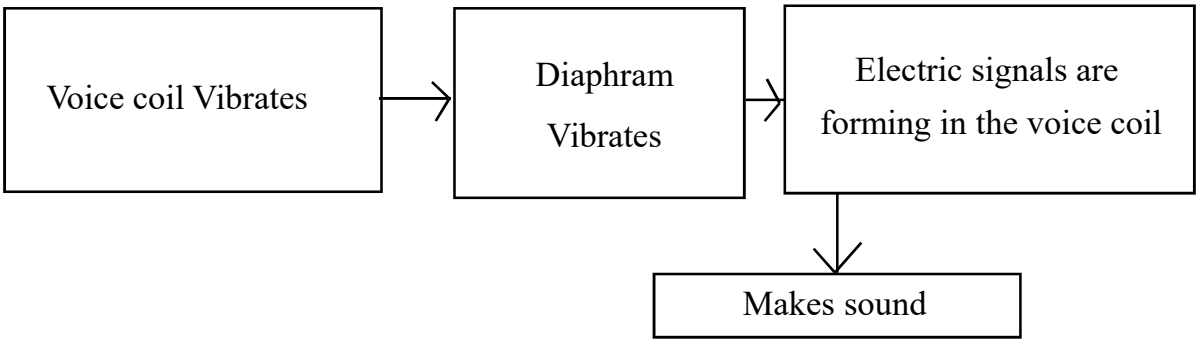
Mirror	Used for
Plane mirror	.....(a).....
Concave	.....(b).....

71. a) Which are the circumstances that cause high electric current, leading to the melting of fuse wire?

b) When fuse wire is included in a household wiring, what are the precautions to be taken?

72. Rearrange the flow chart, which shows the working of moving coil microphone.

a)

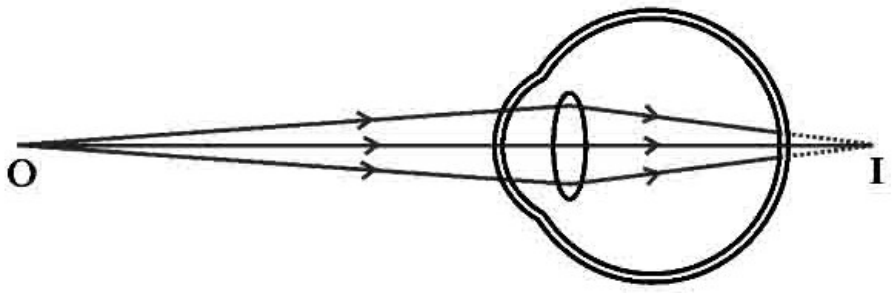


b) Find out one difference between working of moving coil microphone and moving coil loudspeaker?

73. Martch the following

A	B
a) Concave mirror	1) Virtual image with same size of object
b) Plane mirror	2) Virtual image with small size
c) Convex mirror	3) Virtual image with large size of object

74.



This is the picture of image formation of one's eye.

a) What is the name of defect of eye of that person?

b) What is the cause for this eye issue?

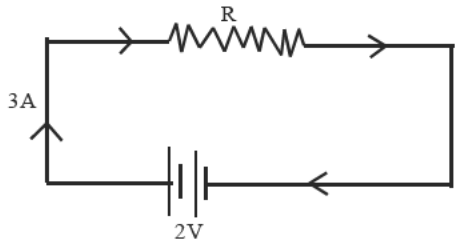
c) How can we correct this defect?

75. a) What do you mean by light pollution?

b) Which week is observed as International dark sky week?

c) What is the aim of this observation?

76. Observe the figure

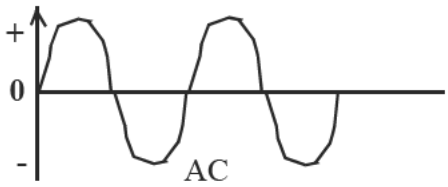
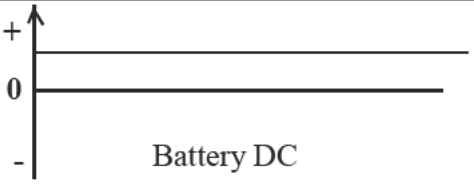
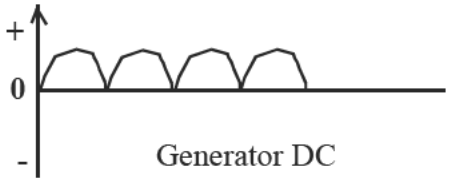


a) Find out the quantity of charge flowing through the resistor in 1 second?

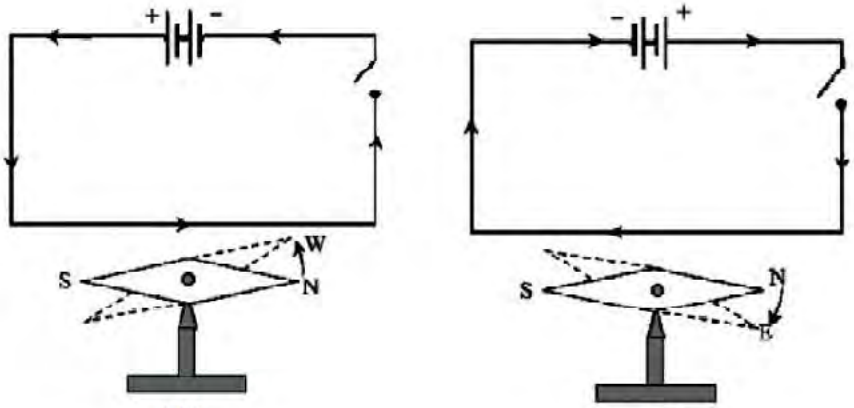
b) Calculate the work done by the battery in one second to move this charge through the resistor?

c) Calculate the power of the Battery?

77. Analyse the table and complete it.

A	B
	* Change the direction continuously * .....(A).....
	* .....(B)..... * emf is not increasing or decreasing
	* .....(C)..... * emf is increasing and decreasing

78. Observe the circuits



a) What happens to the magnetic needles in the both circuit, when the switch is on?

b) What is the difference in movement of needle?

c) By using which law you concluded to a decision?

79. If the magnification of an image formed by a concave mirror is - 1

a) Where will be the position of the object?

b) Where will be the position of the image?

c) Write the characteristics of the image?

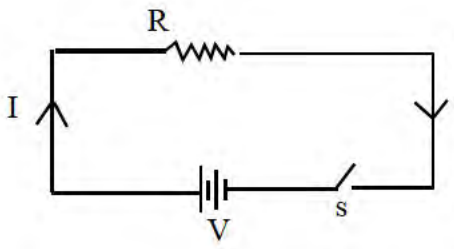
80. We can see the path of light rays in misty mornings.

a) Name the phenomenon?

b) Write the definition of the phenomenon

c) It's intensity is related to .....

81. Observe the figure and find the answer.



In 1 second 200J of heat energy is producing in this circuit.

a) If the resistance is $\frac{R}{2}$, Calculate current in this circuit?

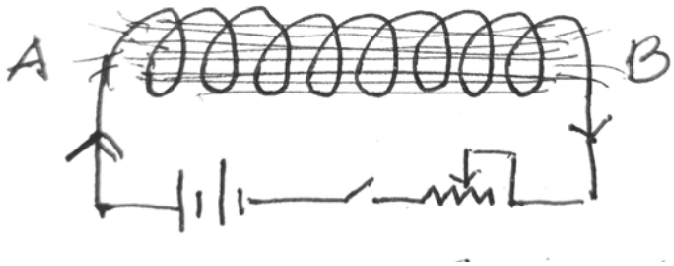
($\frac{I}{2}$, $2I$, I, $4I$)

b) Then how much will be the heat energy produced in this circuit?

(100J, 200J, 800J, 400J)

c) Name the law which used to find the heat energy in the circuit?

82. Observe the figure and find out the answer.



a) If the end A of a solenoid is wounded anticlock wise direction. The end A will act as which pole?

b) The direction of current is opposite and bring a south pole of a magnet near to end A. Whether end A attract or repel? Give reasons.

83. Observe the figure and find the answer

A	B
1) Electromagnetic induction	a) Transformer
2) Mutual induction	b) Moving coil loud speaker
3) Self induction	c) Moving coil microphone
	d. Inductor

84. Some statements are given about the image formation of lens. Differentiate them and tabulate in to coloumns of real image and virtual image.

a) Inverted

b) Erect

c) Can focus into screen

d) Cannot focus in the screen

e) Magnification is negative

f) Image will be at the same side of the object.

85. a) Write down 2 examples for Biomass?

b) What are 2 important consequences of making biomass as fuel?

c) How can we manage biomass in to eco-friendly energy form?

4 Marks Questions

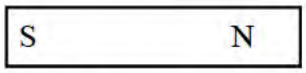
86. Electric heating appliances have a main part in which electrical energy changes into heat energy.

a) Name the part (1)

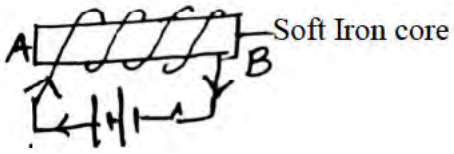
b) Which material is used to that part (1)

c) What are the peculiarities of this part (2)

87. The following figure represents a bar magnet and electro magnet.



Bar Magnet

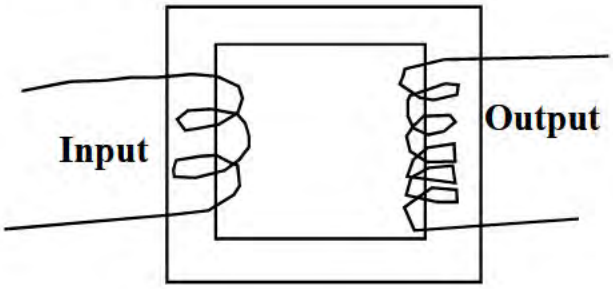


a) Find out the polarity at the End of A? (1)

b) Name the law which help to find the direction of magetic field ? (1)

c) Write any 2 difference betweem bar magnet and electromagnet (2)

88. Observe the figure.



a) Name the device given (1)

b) Write the working Principle. (1)

c) This transformer has 5 turn in primary and 25 turns in secondary. Find out the output voltage when the primary coil has 10V ?

89. Complete the given table (4)

Angle(θ)	No. of imges (n)
45^0	...(a)...
...(b)...	5
90^0	...(c)...
120^0	...(d)...

90. Absolute refractive index of two mediam are given below. Answer the following questions.

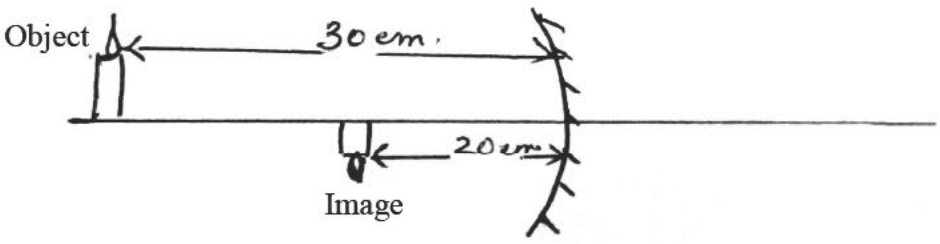
Mediam A = 1.5 ; B = 2.25 (Velocity of light in air is $3x10^8$m/s)

a) Which mediam has greater optical density? (1)

b) Which Mediam has greater speed of light? (1)

c) Calculate the speed of light in mediam A? (2)

91. Observe and analyse the figure?

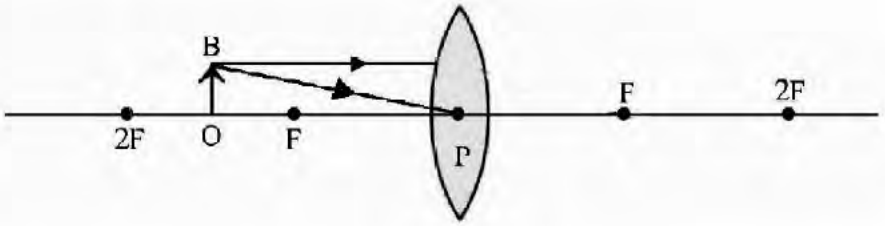


a) Identify the mirror? (1)

b) Pecularities of the image than object? (1)

c) Find out the focal length of the mirror? (2)

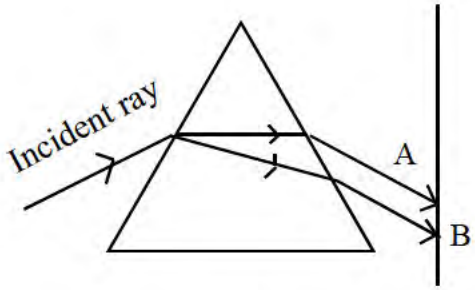
92. An object OB is placed infront of the convex lens.



a) By the help of incident rays draw the image formation? (2)

b) What are the properties of the image? (2)

93. a) Identify the phenomenon of light from the figure? (1)



b) If the incident ray is white light then A = ... colour and B = ... colour. (2)

c) If the incident ray is green light, then the colour obtained on the screen is ..... (1)

94. Electric bulbs are examples of lighting effect of electricity.

a) Name the material used for the preparing the filament of electric bulb? (1)

b) What are the pecularities of this material? (1)

c) The efficiency of incandascent lamp is less. Why? (2)

95. A transformer which has no powerloss has 200 turm in primary and 2000 turn in secondary. Now the primary has 0.5A intensity of electric current and 240V then find out the secondary voltage and secondary current?

96. An heating coil of 550 ohm resistance working on 220V.

a) Find out the electric current in the circuit?

b) Find out the heat energy in 5 minutes?

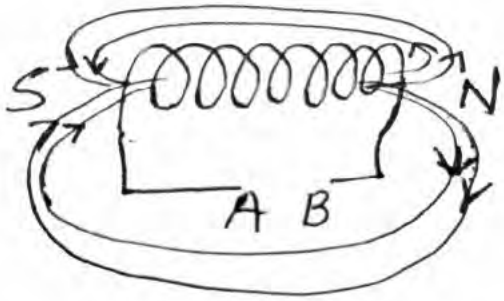
c) Write the equation to calculate electric power?

97. Most of the countries facing the problem Energy Crisis.

a) Define energy crisis?

b) Solutions for minimising energy crisis?

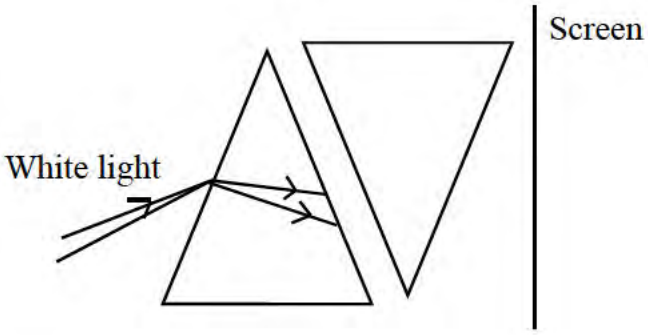
98. Observe the magnetic field of the solenoid in the figure.



a) Draw the complete figure and mark the poles of battery at A and B?

b) What are the factors effecting the magnetic field of a solenoid?

99. Observe the figure.



a) Complete the figure? (2)

b) Which colour is obtained on the screen? (1)

c) Identify the phenomenon of light happening in the first prism? (1)

100. Based on household electrification. Find out the answer?

a) Electric switches and fuse are arranged in which electric line? (1)

b) The earth wire is connected which part of the Iron box? What are the difference of this pin than others? (2)

c) Which method is adopt to arrange the switches and fuse in the electric line? (1)

101. An electrical appliance marked 230V, 960W has connected to the output of a trans former.

a) The primary voltage is 115V. Then identify the type of transformer

b) Find out the electric current flowing both in primary and secondary?

102. You are familiar with cooking gas.

a) Identify the fuel which is using as cooking gas?

b) This gas is a colourless odourless gas. But it produces an odour when there is leackage of gas. Give reason?

c) It is marked D22 on a gas cylinder. What do you understand from this

d) What are the precautions to be taken to avoid accidents due to leackage of gas.

103. a) Identify the mirror which show always small and erect image?

b) Name the situation using their type of mirror?

c) Which part of this mirror helps to form such images?

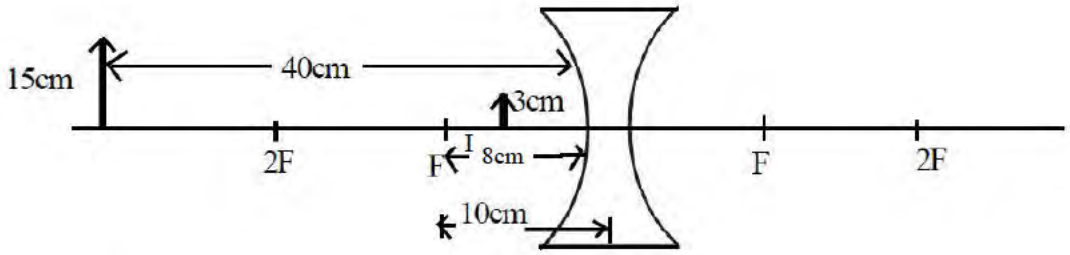
104. Light emitting diodes are LED bulbs.

a) What are the main parts of LED bulbs?

b) What are the importance of LED bulbs than other bulbs?

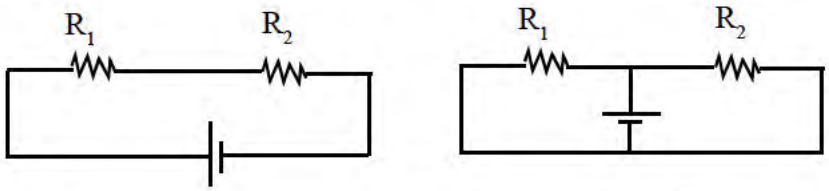
105. a) Observe the figure and find out the values according to New Cartesian sign convention.?

$(u,\ v,\ f,\ h_0, h_i)$



b) Calculate the magnification of this image?

106. Observe the figure.



(A) (B)

a) Draw the circuits A, B and mark the direction of current?

b) Write the equations to find out the effective resistance in the circuits A, B?

107. The two ends of a solenoid is connected to the galvano meter and a bar magnet is moving inwards and outwards of the solenoid continuously.

a) What happens to the needle of the galvanometer and find out phenomenon behind it?

b) To increase the intensity of electric current in the circuit what are the factors to be considered?

108. A lens, which has always produce a virtual image has a focal length 25cm.

a) Identify the type of lens?

b) What are the other pecularities of the image?

c) Calculate the power of this lens?

109. Newton's colour disc is an example pf Persistance of vision.

a) What are the colour's arranged on a Newton's colour dic?

b) Which colour has seen when it is rotating very fastly?

c) Explain the phenomenon Persistance of Vision?

110. a) Complete the table

Mirror	Situation used
Plane mirror	.....(a).....
Concave	.....(b).....
Convex mirror	.....(c).....

b) From these mirrors whichc has more aperture...?.

111. An object is placed at a distance of 15 cm. in front of a mirror. According to new cartesian sign convention focal length is - 6 cm.

a) What type of mirror is this (1)

b) Calculate the distance between the mirror and image. (2)

c) If the magnification of the image of an object of length 3 cm by a mirror is -2, find the height of the image (1)

112. a) What are the similiarities and differences between a moving coil microphone and a moving coil loudspeaker? (2)

b) Which device is used for strengthening the weak signal obtained from Microphone? (1)

c) Name a device which works on same principle of moving coil microphone. (1)

113. Two resistance of 3Ω, 6Ω , 6V battery and switch are given,

a) Depict a figure of series connection using these component? (1)

b) Calculate the effective resistance of series connection? (1)

c) Calculate the current in this circuit? (1)

d) Calculate the effective resistance, if resistors are connected in parallel? (1)

114. Some light conducting media are given in the bracket.

(Air, Diamond, Water, Glass)

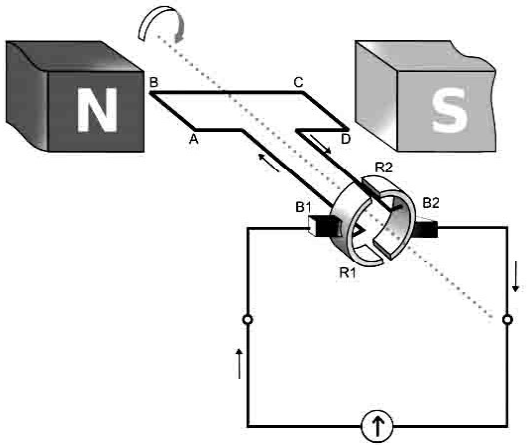
a) Which of these has greater optical density? (1)

b) Arrange the media in the decreasing order of their speed of light? (1)

c) What is the relation between optical density and speed of light? (1)

d) When light passes from water to glass, what happens to the path of light? (1)

115. The figure of a generator is given.



a) Identify the generator? (1)

b) What is the structural difference between AC generator and DC generator?(1)

c) What is the energy change that takes place in a motor and in a generator? (1)

d) Eventhough the induced emf is AC, the current produced by a DC generator is DC. How? (1)

116. Choose the appropriate words from bracket related to following statements.

(Concave, Convex, Real, Virtual, Principal focus, Pole)

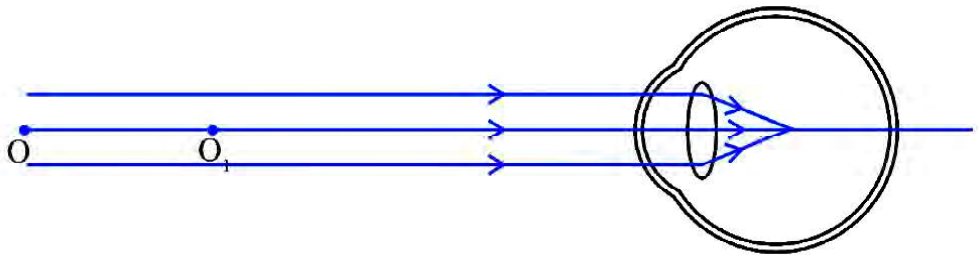
a) Rear view mirror in vehicles is ..... (1)

b) According to New cartesian sign convention, distances are measured from the ..... (1)

c) When the magnification of a mirror is positive, the image is ..... (1)

d) ..... mirror is used as solar concentrators. (1)

117. The following figure shows that the image formation in the eye of a person.



a) Identify the eye defect of the person? (½)

b) What are the reasons behind this defect? (1)

c) How can it be rectified? (½)

d) Draw its ray diagram? (2)

118. When electricity is transmitted to distant places there is loss of energy in the conductors in the form of heat.

a) What are the methods to reduce heat generated? (1)

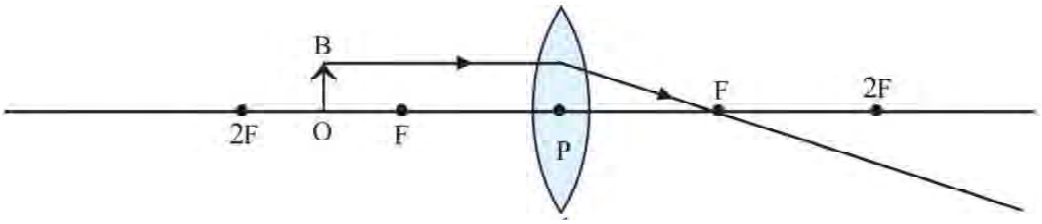
b) Which type of transformer is there in power station? (½)

c) Which type of transformer is a distribution transformer? (½)

d) If a person standing on the earth touches a phase line, will he get an electric shock? Why? (1)

e) What is the potential difference between 2 phase line? (1)

119. a) Complete the following ray diagram (1)



b) Write the position of the image formed? (1)

c) Write down the nature of the image? (1)

d) If concave lens is placed instead of convex lens in the above figure, what will be position and nature of the image formed? (1)

120. A copper wire and a Nichrome wire of same length and diameter are connected in series in a circuit. When the current flow through the circuit,

a) Which one will be heated more? Why? (1)

b) Which law will help to calculate the heat generated in the conductor? (1)

c) A current of 1A flow through an electrical device of resistance $100\,\Omega$. If this device works for 5 minutes. Calculate the heat generated? (2)

EQUIP - 2024

SSLC - EXAMINATION SUPPORT MATERIAL

PHYSICS - ENGLISH MEDIUM

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1 Mark Question - Answers

1. Peat. Remaining subtances obtianed when coal is distilled in the absence of air.
2. Refraction
3. 11000V or 11Kv
4. Convex Mirror
5. Concave lens
6. Motor principle
7. Loss of energy in the forming heat
8. Butane
9. $\frac{3x10^8}{2x10^8} = 1.5$
10. Heating effect
11. Electric energy to mechanical energy
12. 50Hz
13. 24cm
14. 90^0
15. Fossil fuel, Fossil fuel is brown energy. Remaining are Green energy
16. White persistance of vision
17. -1
18. Metal part
19. $P=IR^2$
20. Voice coil
21. Phase line
22. More deviate $\longrightarrow$ Violet
    Less deviate $\longrightarrow$ Red

23. Ethyl mercaptan
24. Near sightedness
25. Inductor
26. The amount of heat liberated by the complets combustion of 1kg of fuel is its Calorific value.
27. Near point : 25 cm

    Far point : Infinity
28. $\frac{1}{4}$
29. (c) Low melting point
30. Electromagnetic induction
31. Between F and 2F
32. Red colour has more wave length. Hence it scatters less.
33. Liquified Petroleum Gas
34. 2
35. Fuels obtained from plants and animals
36. In parallel manner
37. Resistance : ohm
38. Short circuit

    Over loading
39. Coal
40. $P = \frac{100}{f(cm)} = \frac{100}{50} = +2D$
41. Between 'F' and 'P'
42. 400V
43. Satellite
44. h_0 = 4cm, hi = ?

    m = -2

    $m = \frac{hi}{ho} = -2 = \frac{hi}{4}$

hi = -2 x 4

- 8 cm

45. Thumb $\longrightarrow$ force

Middle finger $\longrightarrow$ current

2 Marks Questions - Answers

46 a) Refective = $R/n = \frac{3\Omega}{10} = 0.3\Omega$

47. When solar energy /Light Energy falls on N side of PN junction diode, a small electric current is obtained due to the flow if electronus to P region from N region. This phe nomenon is called photovoltaic effect.

48. Earth pin is thick and long. As it is long it first comes in contact with the earth. Similarly it loses the contact with the earth only at the end. As it is thick it offers less resistance. Hence it carry more current.

49. 1. Number of turns in the solenoid
    2. Intensity of current
    3. Area of cross section of the soft Iron core.

50. Persistance of vision

When an object is viewed by a person, its image remains in the retina of the eye for a time intervel of (0.065 s) $\frac{1}{16}s$ after seeing it.

51. On complete combustion of 1kg of the fuel produced a heat energy of 45000KJ.

Availability, easy to transport, easy to handle.

52. (i) Intensity of light connected in bulb (fig.b) is less when it switched 'ON'

(ii) Due to back emf

53. Atmospheric refraction

Bending of ray of light when it travelling from one transparent medium to another.

54. Into the paper.

Flemings Left Hand Rule.

If we stretch forefinger, middle finger and thumb of our left hand in mutually in direction then fore finger indicate diretion of magnetic field, middle finger indicate direction of current and thumb indicate direction of force.

55. (ii) and (iii)

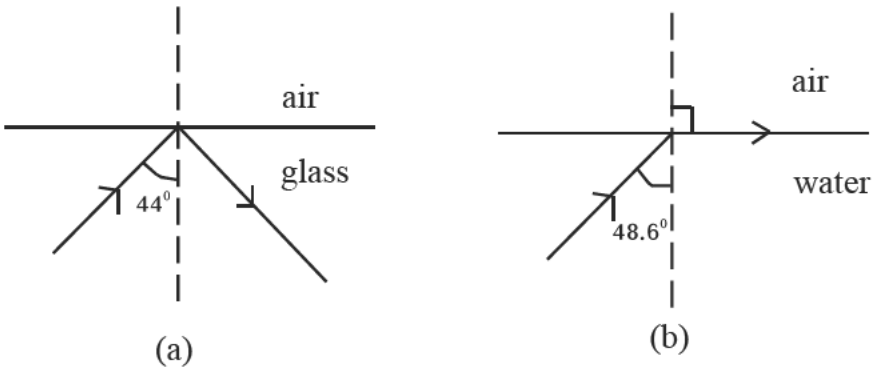
56. More life span

Less consumption of electricity

More light

57. We can observe a bend in pencil at the surface of separation of air and water. It is due to refraction. Bending of ray of light when it is travelling from one medium to another.

58.



(a) (b)

59. a) Potential Energy ⟶ Kinetic Energy ⟶ Mechanical Energy ⟶ Electrified Energy

b) Pallivasal Kuttiyadi

Moolamattam

60. Tyndal Effect

When rays of light pass through a colloid or suspension, the tiny particle get illuminated due to scattering. Because of this path of light is made visible. This phenomenon is called Tyndal Effect.

3 Marks Questions - Answers

61. a) $A = \frac{W}{V}$

$= \frac{40}{200} = 0.2A$

$= 1A$

b)

$R = \frac{V^2}{P} = \frac{200x200}{40} = 1000\Omega$

$V = 100V, \quad R = 1000\Omega$

$P = \frac{V^2}{R} = \frac{100x100}{1000} = 10W$

62. a) Nichrome

b) Aluminium

c) Fig (a), series connection - same current flows $H=I^2Rt$ which resistor has greater R, it produces more heat.

Fig (b) - Parrallel connection. Aluminium less resistance. So more current flow through it and heat generated is more.

63. a) Surrounding the current carrying conductor there will be a magnetic field. Both magnetic fields coming in action and hence there is a force.

b) Current, strength of magnetic field.

c) Fleming's left hand rule.

64. a) B1. Because Dc is applying. There will be no changing magnetic field. No mutual induction.

b) B1 and B2.. These is a varying magnetic field and mutual induction takes place.

65. a) To control ac in a circuit with out power loss.

b) Inductor

Resistor - There will be energy loss in the form of heat.

Inductor - There will be no power loss.

66 a) If the switch is ON, The bulb 'B' glows more. If the switch is OFF, The bulb 'B' glows less.

b) When switch is ON, effective R will be less and current will be more. Hence more glow.

When such is OFF, first resistance is not in circuit and total R will be a greater value. Hence less curernt and less glow.

67. a) a- Armature

b - Split ring

b) To change the direction of current

c) DC Motor - Motor Principle

DC Generator - Electro Magnetic Induction.

68. a - 2

b - 4

c - 1

69. a) Light should travel from denser medium to rarer medium.

b) Total Internal reflection

c) 90^0

70. a) Convex mirror

b) a) To see face

b) Shaving mirror

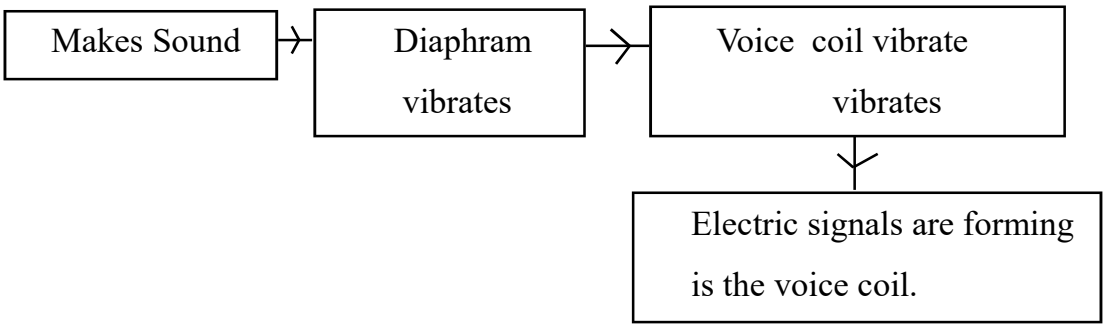
71. a) Short circuit

Overloading

b) 1) The ends of the fuse wire must be connected firmly at appropriate points.

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

72 a)



b) Microphone - Mechanical Energy to Electrical Energy

Loud Speaker - Electrical Energy to Mechanical Energy

73. Match the following

a - 3

b - 1

c - 2

74. a) Long sightedness (Hypermetropia)

b) 1) Smaller size of eye ball

2) Low power of eyes

c) By using convex lens of suitable power.

75. a) The use of light in excess in a non-judicious manner is known as Light Pollution.

b) The week of the new moon in April

c) To aware the concecutions of light pollution.

76. a) $Q = Ixt$

$3x1 = 3C$

b) $W = VxQ$

$= 2x3 = 6J$

c) $P = VxI$

$= 2x3 = 6W$

77. a) emf is increasing and decreasing

b) Direction is not changing

c) Direction is not changing

78. a) Both - Vibrates

b) A - Anticlock wise

B - Clockwise

c) Right hand thumb rule

79. a) at C (2F)

b) at C (2F)

c) Real, Inverted

80. a) Tyndal effect

b) When rays of light pass through a colloidal fluid the tiny particles get illuminated due to scattering. Due to this path of light is made visible.

c) Size of particles

81. a) 2I

b) $H = I^2Rt$

$= (2I)^2 \times \frac{R}{2} \times t$

$= 2I^2Rt$

$= 2 \times 200J =$ **400J**

c) Joule's law

82. a) North pole

b) Repel. Because now the end A is acting as south pole

83. Match the following

A	B
1	c
2	a
3	d

84.

Real Image	Virtual image
a	b
c	d
e	f

85. a) Fire wood, cow dung cake

b) 1. Air pollution

2. Health pollution

c) Biogas plant

4 Marks Questions - Answers

86.

a) Heating coil

b) Nichrome

c) High melting point, hight resistivity, becomes red hot for a long time.

(Any 2)

87. a) North pole

b) Right hand thumb rule - James clerk maxwell

c) Bar magnet - magnetic power cannot change permanent

Electro magnet - magnetic power changes according to the intensity of electric power temporary. When the electricity is out off magnetic power loss.

88. a) Step up transformer

b) Mutual induction

c) $\frac{V_1}{N_1} = \frac{V_2}{N_2}$ $\frac{10}{5} = \frac{V_2}{25}$ $V_2 = 50V$

89. No. of Images $n = \frac{360}{\theta} - 1$

a) 7

b) 60^0

c) 3

d) 2

90. a) Median B

b) Median A

c) $n = c/v \quad V = c/n$

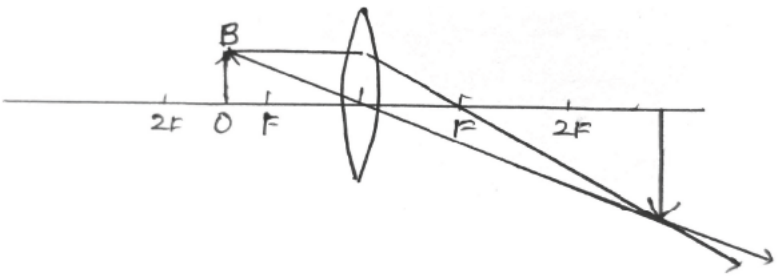
$V = \frac{3x10^8}{1.5} = 2x10^8 m/s$

91. a) Concave mirror

b) Real, inverted and smaller than object.

c) $f = uv/u+v$; $f = \frac{(-30)x(-15)}{-30+-15}$; $f = \frac{450}{-45} = -10cm$

92. a)



b) Inverted, Real & bigger than object

93. a) Dispersion of light

b) A = Red, B = Violet

c) Green (not a composite light)

94. a) Tungston

b) High resistivity, high melting point

c) Most of the electric energy is loss as heat energy.

95. a) $\frac{Vs}{Vp} = \frac{Ns}{Np}$;

$\text{Vs} = \frac{\text{VpxNs}}{\text{Np}}$; $\text{Vs} = \frac{240\text{x}200}{2000}$; $Vs = 24V$

$\text{VsxIs} = \text{VpxIp}$; $\text{Is} = \frac{\text{VpxIp}}{\text{Vs}}$; $\text{Is} = \frac{240\text{x}0.5}{24}$; $\text{Is} = 5\text{A}$

96. a) $I = \frac{V}{R}$; $I = \frac{220}{5}$ $I = 4A$

b) $\text{H} = \text{I}^2\text{Rt}$ $(\text{H} = \text{VIt}; \text{H} = \frac{\text{V}^2}{\text{R}}\text{t})$ (½ mark)

$\text{H} = 4\text{x}4\text{x}55\text{x}5\text{x}60; \text{H} = 220\text{x}4\text{x}300$ (1 mark)

$\text{H} = 26400\text{J}$ (½ mark)

c) $\text{P} = \text{VI}$ (OR) $\text{P} = \text{I}^2\text{R}$ (OR) $\text{P} = \frac{V^2}{R}$ (1 mark)

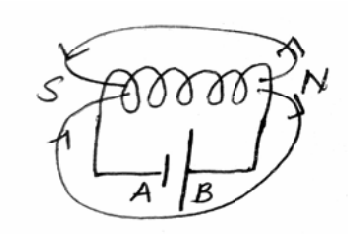
97. a) Increasing demad and decreasing availability of resources energy crisis.

b) 1) Judicious utilization of energy

2) Maximum utilization of solar energy

3) Minimising the wastage of water?

98. a)

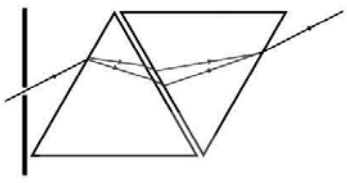


A = Negative

B = Positive

b) (i) No.of turns in the Solenoid (ii) Intensity of current

99. a)



b) White

c) Dispersion of light. White light is a composite light.

100. a) Phase

b) The earth wire is connected to the metallic part of Iron box.

The differences are thicker and longer than other pins.

c) Parallel

101. a) Step up transformer

b) Intensity of elecric current is

Secondary : $P = VI$; $I = P/V$; $I = 960/230$: $I = 4.17A$

Power is same in both circuits in a transformer.

Primary : $P = VI$; $I = P/V$; $I = \frac{960}{115}$; $I = 8.34A$

102. a) LPG / Butane /C^4H^{10}

b) Ethyl Mercaptan is adding for odour

c) The expiry time is December 2022.

d) Check the rubber tube frequently, Obem the knob only after opening the Regulator.

103. a) Convex mirror

b) Rearview mirror

c) It has a large aperture

104. a) Base unit, Power supply unit, Heat sink, Printed circuit board, Diffucer cup.., base plate (Any 2)

b) No heat loss, No environmental pollution, Easy to handle, Less powewr consumption (Any 2)

105. a) u = -40cm

v = -8

f = -10cm

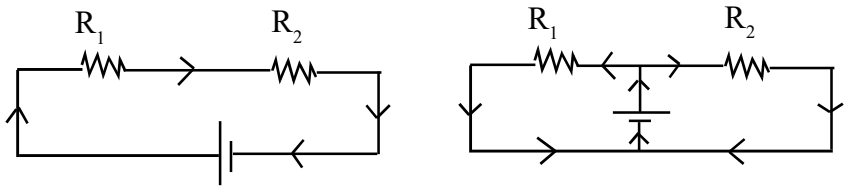
hi = 3cm

ho = 15cm

b) Magnification (m) $\frac{hi}{h0}$ OR $\frac{V}{u}$

$$m = \frac{3cm}{15cm} \; or \; \frac{-8cm}{-40cm} = \frac{1}{5}$$

106 a)



(A) (B)

b) Circuit A ; $R = R_1 + R_2$

Circuit B ; $R = \frac{R_1 R_2}{R_1 + R_2}$

OR $\frac{I}{R} = \frac{I}{R_1} + \frac{1}{R_2}$

107. a) Galvanometer needle deflects

Reason : Electromagnetic Induction

b) Factors:

1) Number of turns in the solenoid

2) The speed of bar magnet

3) The magnetic power of bar magnet

When these are increased intensities of electricity increases in the circuit.

108. a) Concave lens

b) Small, erect

c) Power of lens P = $\frac{1}{\text{focal length of less in meter}}$

$$P = \frac{1}{-25/100} \;:\; P = \frac{100}{25} \;:\; P = -4D$$

109. a) VIBGYOR

b) White

c) The image remains in the retina $1/16$ seconds only OR 0.0625 second.

110. a)

Mirror	Used situation
Plane mirror	a) Looking face
Concave	b) ENT head mirror/search light Dentist mirror/shaving mirror
Convex mirror	c) Rear view mirror

b) Convex mirror

111 a) Concave

b) u = -15cm

f = -6cm

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$V = \frac{uf}{u - f} = \frac{(-15)x(-6)}{(-15) - (-6)}$$

$$= \frac{+90}{-9} = -10cm$$

c) ho = 3cm

m = =2

$$m = \frac{hi}{ho}$$

$$-2 = \frac{hi}{3}$$

hi = -2x3 = -6cm

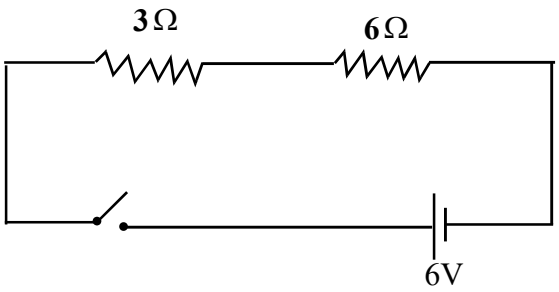
112. a) Similaritiess - Permanent Magnet, Voice coil, Diaphram.

Difference	Microphone	Loud Speaker
Working Principle	Electromagnetic Induction	Motor Principle
Energy change	Mechaical Energy to Electrical Energy	Electrical Energy to Mechaical Energy

b) Amplifier

c) Generator (ac/dc)

113. a)



b) Effective resistance $R = R_1 + R_2$

$= 3 + 6 = 9\,\Omega$

c) Current $I = \frac{V}{R}$ (Ohm's law)

$= \frac{6}{9} A$ Or $\frac{2}{3} A$

d) $R = \frac{R_1 R_2}{R_1 + R_2} = \frac{3x6}{3+6}$

$= \frac{18}{9} = 2\Omega$

114. a) Diamond

b) Air, Water, Glass, Diamond

c) As optical density increases, speed of light decreases

d) Deviate towards the normal

115. a) DC Generator

b) Split Rings in DC generator

Slip Rings in AC generator

c) Generator - Mechanical Energy to Electrical Energy

Motor - Electrical Energy to Mechanical Energy

d) By using split ring commutator

116. a) Convex

b) Pole

c) Virtual

d) Concave

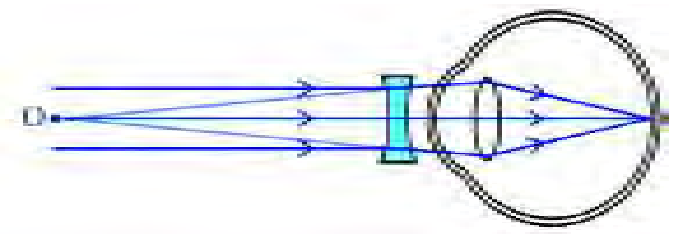
117 a) Myopea (Near Sightedness)

b) Size of the eye ball is larger

Focal length of lens is low (power is high)

c) By using a concave lens of suitable power.

d)



118. a) Reduce current and resistance

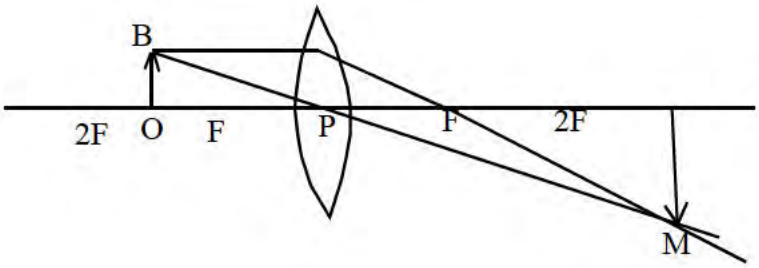
b) Step up transformer

c) Step down transformer

d) Get electrical shock. Because there is a potential difference between earth and a phase line is 230V.

e) 400V

119. a)



b) Beyond 2F

c) Real, inverted, enlarged (Any 2)

d) Position - Infront of the lens, between P and F of the same side.

Nature - Virtual, Erect, Diminished

120. a) Nichrome wire, Due to high resistance

b) Joule's law

c) $R = 100\Omega$,

$I = 1A$

$t = 5$ minutes $= 5x60$ seconds

$H = I^2Rt$

$I^2 \times 100 \times 5x\ 60$

$= 30000J$

♦♦♦