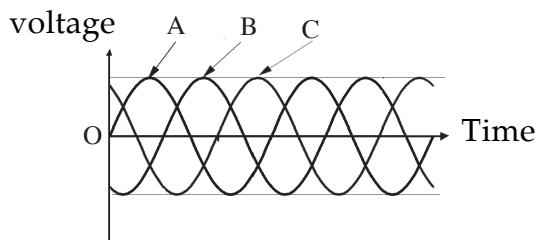


## Unit : 07

# Generation and Distribution of Power

**Concept :** Three Phase Generator

1. The graph given is that of electricity from the output of a distribution transformer. Observe the graph.

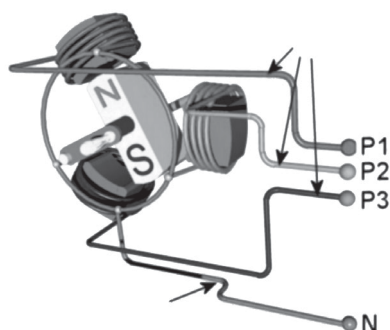


- What is the type of generator which gives the electricity represented by the graph?
- What is the difference between the voltages in the coils A and B?
- The maximum voltage in the coils, A, B and C is the same. Explain the reason.

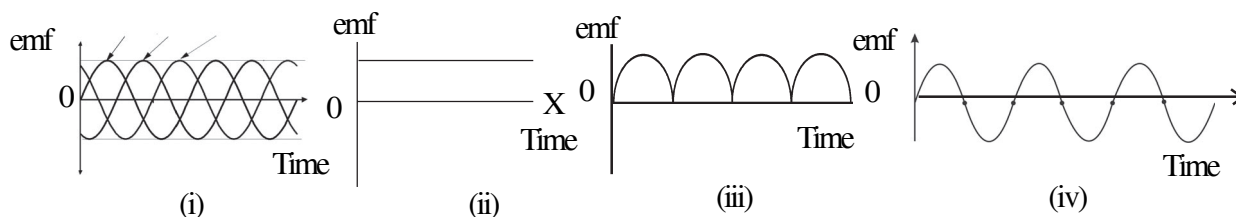
**Score (3) time (4 minute)**

**Concept :** Three Phase Generator

2. Observe the figure.



- What type of generator is this? (1)
- What is the potential difference between the Earth and the line N (neutral) from this? (1)
- Which one of the following graphs represents the electricity generated from this type of generator? (1)



**Score (4) Time (5 minute)**

**Concept : Power Generator**

3. You know that generators are used to produce electricity on a large scale.
- What is the type to which they belong among the generators given below. (1)  
( DC generator, Single phase AC, Three phase AC)
  - Why is the field magnets of these generators made as rotor? (1)
  - What is the need for the exciter in power generators? (1)

**Score (4) Time (5 minute)**

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**Concept : Power transmission**

4. Different steps related to generation and transmission of power are given below. Write them in the right order.
- Distribution transformer converts 11kV to 230V.
  - For supply to heavy industries 220 kV is converted to 66 kV.
  - Generator is made to work by rotating the turbine.
  - Power transmission starts at 220kV from the power station.
  - Household consumers get electricity.

**Score (3) Time (4 minute)**

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**Concept : Transmission loss**

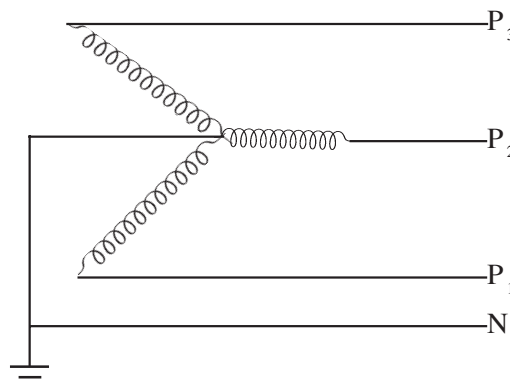
5. The electricity generated at the power stations is transmitted to distant places after raising its voltage.
- What is the voltage at which electricity is generated in the power station?
  - What is the problem to be faced when power is transmitted to distant places through conducting wires?
  - How are these problems solved when electricity is transmitted at high voltage?

**Score (4) Time (4 minute)**

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**Concept : Star connection**

6. Observe the figure



- What is the name by which the mode of connection of the secondary coils of a distribution transformer is known?
- From which of these pair of lines can electricity be taken to electrify our houses?
- Why don't the birds sitting on the line P, get an electric shock?
- When a moving fan is switched off it continues to rotate for some more time.

**Score (4) Time (4 minute)**

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**Concept :** Household Circuit (Electrification)

7. Observe the circuits given below.

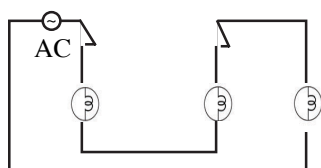


fig. A

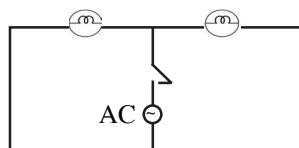


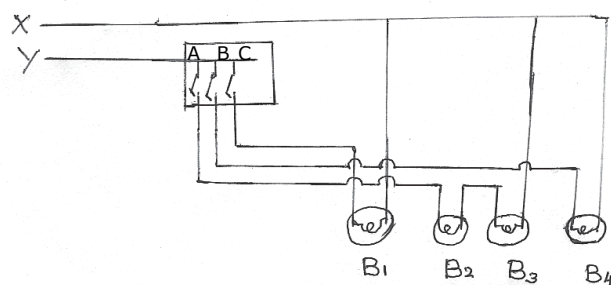
fig. B

- Distinguish between the figures which represent series and parallel connections.
- Parallel connection is the suitable mode of connection for household wiring. Explain why it is so.

**Score (4) Time (4 minute)**

**Concept :** Household wiring

8. The figure represents a part of the diagram for household circuit drawn by a student.

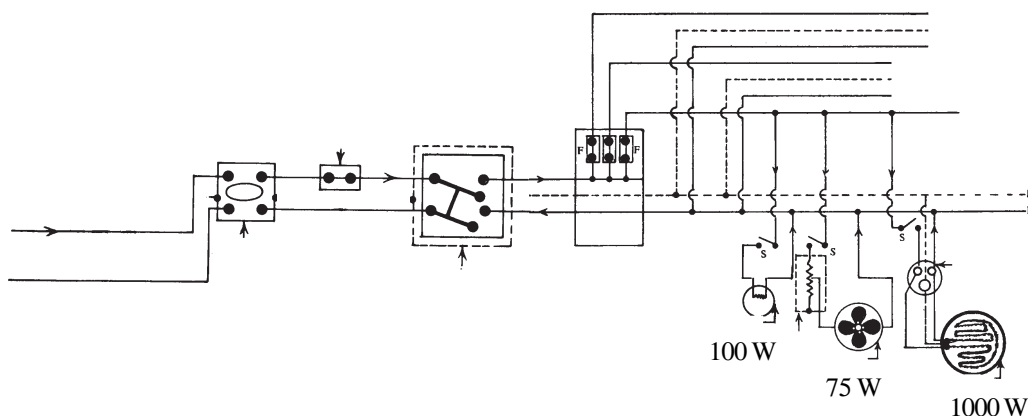


- Of X and Y, which is the phase line? (1)
- Which bulb will glow when B is switched on? (1)
- In this circuit which are the bulbs connected in series? (1)
- Give directions to connect to this circuit a fuse and a three pin plug. (2)

**Score (5) Time (8 minute)**

**Concept :** Household wiring, the unit of electrical energy

9. A household wiring circuit is given.

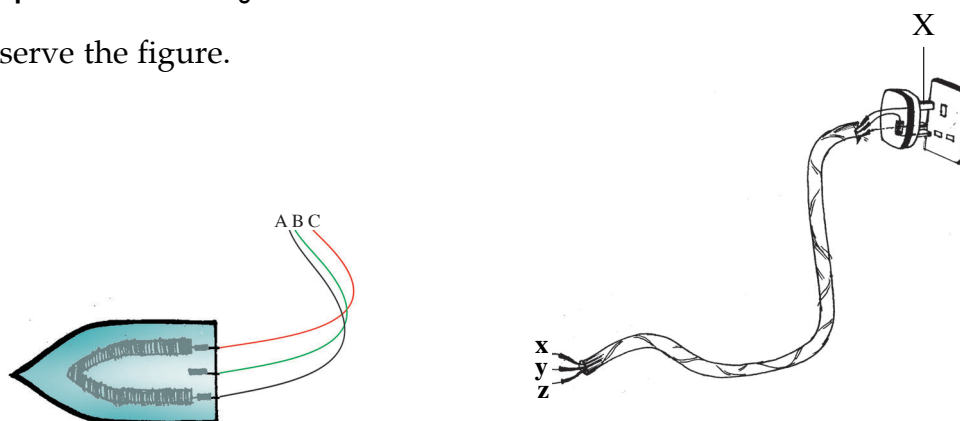


- a. What is the mode in which the different components are connected to the circuit? (1)
- b. The heater is connected to a three pin plug. What is the advantage of this? (1)
- c. The reading of the watt hour metre at present is 1230. If all devices work for 20 hour what will be the reading afterwards?

**Score (5) Time (6 minute)**

**Concept : Three Pin Plug**

10. Observe the figure.



- a. To which of the wires of the three pin plug are to be connected each of the wires A, B, C from an electric iron? (1)
- b. What is your reaction to the statement that in an electric iron, a two pin plug can be used instead of a three pin plug. (2)

**Score (3) Time (5 minute)**

**Concept : Measurement of electric energy**

11. An electrical device consumes 1000J of energy in one second.
  - a. What is the power of this device? (1)
  - b. How much energy in kWh will be consumed if this device works for two hours? (1)
  - c. How many hours a 230V, 100W bulb has to burn, to consume this much of energy? (2)

**Score (4) Time (8 minute)**

**Concept : Measurement of electrical energy**

12. Given below are the details of the entries made by a student regarding the activities of the "School Energy Conservation Club".

The appliances at home and the time they function in a day.

Appliance	Power	Time	Number
Bulb	100W	5h	4
Fan	60W	5h	2
CFL	10W	10h	5

Watt hour metre reading at 5 pm on 07.10.2011 = 0839 kWh

Watt hour metre reading at 5 pm on 08.10.2011 = 0842 kWh

My activity today : Replaced 4 bulbs with CFLs of 10W each

- How many units of energy was consumed a day before 5 pm on 08.10.2011 (1)
- How many units of energy was consumed (in the day) before 5 pm on 09.10.2011 (1)
- Prepare a poster depicting the need for conserving electrical energy. (2)

**Score (5) Time (10 minute)**

**Concept : Power Generator**

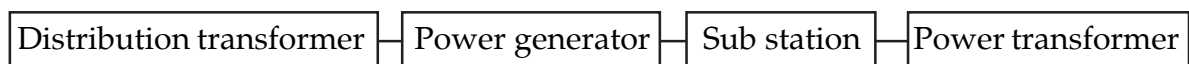
13. Fill in the second pair of terms using the relation between the first pair.

Field magnet : rotor :: Armature : ..... (1)

**Score (1) Time (1 minute)**

**Concept : Power transmission**

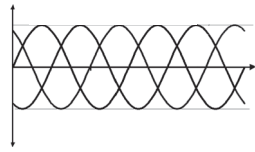
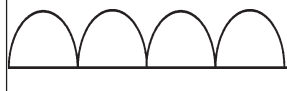
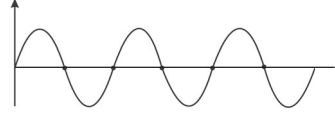
14. Given in the box are certain statements related to power generation and distribution arrange them in the right sequence.



**Score (1) Time (3 minute)**

**Concept : Single phase generator, three phase generator**

15. Match the statements in the first column with the statements from the second and third columns.

A	B	C
Single phase AC Generator	Auxiliary generator	
Three phase AC generator	One armature	
Exciter	Three armature coils	

**Score (3) Time (6 minute)**

**Concept :** Household circuit

16. Find out the odd one.

Fuse; MCB; Three pin plug; ELCB

**Score (1) Time (2 minute)**

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**Concept :** Star Connection

17. Fill in the blanks

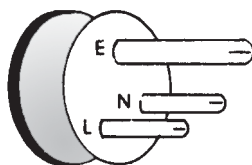
Distribution transformer ..... Coil : Star connection (1)

**Score (1) Time (2 minute)**

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**Concept :** Three pin plug

18. To which line the pin marked E in the figure is to be connected?



**Score (1) Time (1 minute)**

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