

S.S.L.C. EXAMINATION, MARCH - 2018

PHYSICS

(English)

Time : 1½ Hours

Total Score : 40

Instructions :

- First 15 minutes is cool off time.
- Answer the questions only after reading instructions and questions thoroughly.
- Questions are given in A, B, C, D sections. Write only 4 questions from each section.
- Score allotted for sections A, B, C, D are 1, 2, 3 and 4 respectively.

Score

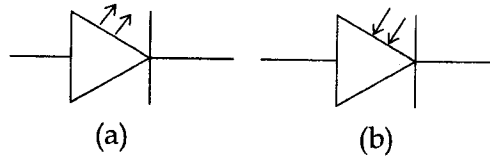
SECTION - A

1. Write any two factors that influence the speed of sound through air.
2. Solar energy is treated as the energy source of the future. Write any two solar devices working on solar energy that can be utilised in daily life.
3. Distinguish the relationship between the terms given below and fill in the blanks.
  - (i) Generator → Armature → Induced emf.
  - (ii) Microphone → \_\_\_\_\_ → Induced emf.
4. Find the odd one from the brackets and give reason behind your selection.  
[Blue, Yellow, Red, Green]
5. Write any two problems faced when electrical power is transmitted to distant places.

SECTION - B

6. Correct the underlined part of the following statements appropriately if it is wrong.
  - (a) Conductors having higher melting point than the circuit elements are used as fuse wire.
  - (b) The amperage of the fuse wire must be reduced as the power of the equipments included in the circuit is increased.
7. A student standing in front of a huge building claps his hands. He heard its echo after 2 seconds.  
[Speed of sound in air is 340 m/sec]
  - (a) Calculate the distance between the student and the building.
  - (b) Write the characteristics of the ear behind the phenomenon called echo.

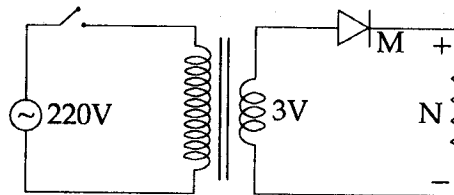
8. Identify the electronic components from the following symbols. Write any one difference between them.



9. The statements given below are related to a step-down transformer. Tabulate them as those related to primary and secondary.
- Winding with thick wire
  - Current flowing at higher voltage
  - Winding with thin wire
  - Current flowing at a low voltage
10. Explain how the following arrangements are useful in power transmission.
- Reduction in the resistance of the conductor.
  - Increase in the transmission voltage.

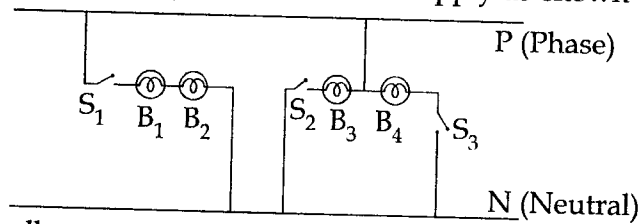
### SECTION - C

11. Explain the reason for the following in a power generator.
- Armature is used as stator
  - Strong electromagnets are used as field magnet
  - Three armature coils are arranged at  $120^\circ$  angular separation
12. Analyse the given circuit diagram of a half wave rectifier and answer the following questions.



- Identify the components labelled as M and N.
  - What are the changes to be made in the following components for converting this to a full wave rectifier ?
    - Transformer
    - No. of Diodes
  - Draw the output wave form of a full wave rectifier.
13. Explain the following every day life experiences scientifically.
- Spirit kept in an open watch glass is converted into the gaseous state even at room temperature.
  - The variation in atmospheric temperature do not effect our body temperature instantaneously.
  - Complete melting of ice-cream will not happen suddenly.

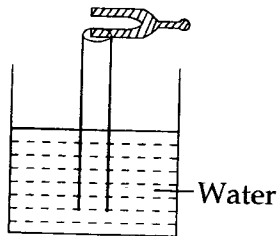
14. Four [40 W, 230 V] bulbs are connected to a 230 V supply as shown below.



- (a) Which are the bulbs connected in series ?  
 (b) Which are the bulbs that can work at 40 W power ?  
 (c) Write two advantages of connecting household equipments in parallel.
15. Roshan observed a beautiful rainbow in the western Sky from his school ground.  
 (a) When did Roshan observe the rainbow ?  
 [Morning, Noon, Evening, Prediction of time is impossible]  
 (b) Draw the diagram of dispersion taking place in a water droplet during the formation of a rainbow.

#### SECTION - D

16. The following diagram shows an experiment using a beaker of large height and a pipe [Excited tuning fork is used]

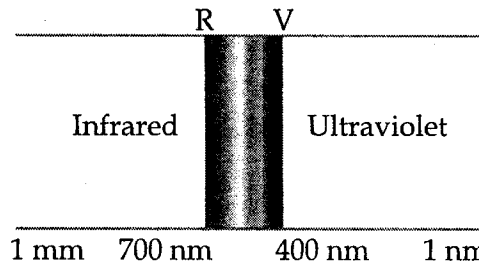


- (a) What happens to the loudness of the sound produced by the tuning fork while adjusting the height of air column inside the pipe ?  
 (b) What will be the natural frequency of air column at the time of hearing the loud sound if the frequency of given tuning fork is 512 Hz ? Explain the phenomena behind this loudness.
17. Answer the following questions by analysing the table :

No.	Substance	Mass	Temperature difference	Heat given
1	Coconut oil	10 kg	10 K	210000 J
2	Copper	10 kg	10 K	38500 J
3	Water	10 kg	10 K	420000 J
4	Lead	10 kg	10 K	1200 J

- (a) Why the temperature difference remains the same when various amounts of heat energy is given to the above substances of equal masses ?  
 (b) Which substance has higher specific heat capacity ?  
 (c) Name the substance in the above table which exhibits the largest temperature change when the same amount of heat is given.

18. An electric heater of resistance  $115 \Omega$  is made to work on 230 V supply.
- What will be the current through this heater while it is working ?
  - Calculate the power of this heater.
  - Calculate the heat generated by this heater if it works for 10 minutes.
19. Analyse the diagram of solar spectrum and write answer.



- Which radiation has a wavelength greater than visible light in this spectrum ?
  - Which colour has the highest frequency in the visible part of the solar spectrum ?
  - Write one merit and demerit of infrared and ultraviolet radiations.
20. (a) Write one example each for fossil fuels in solid and liquid state.
- Which fossil fuel produces ammonia when distilled in the absence of air ?
  - Write down the process of evolution of fossil fuels on earth.