

# First terminal examination Physics 2023

## ANSWER KEY BY Arun

### PHYSICS 1006 EM

Question 1 to 5 each carry 1 mark.

1. Electric Potential or Voltage

$$w/q = v$$

2. Filament is a part of Incandescent lamp

$$3. I = V/R = 3/6 = 0.5A$$

4. Right hand thumb rule

5. ii Second circuit.

Question 6 to 10 each carry 2 mark.

6. When a discharge lamp is connected to a source of electricity, discharge happens and the gas in between the electrodes gets ionised. Ionised atoms move at high speed and collide with unionised atoms among them and excite them to higher energy states. Excited atoms come back to their original states for attaining stability. During this process, the energy stored in them will be radiated as light.

$$7. \quad P = I^2 R = 9 \times 100 = \underline{900W} \quad \left| \quad R = 100\Omega \right. \\ \left. I = 3A \right.$$

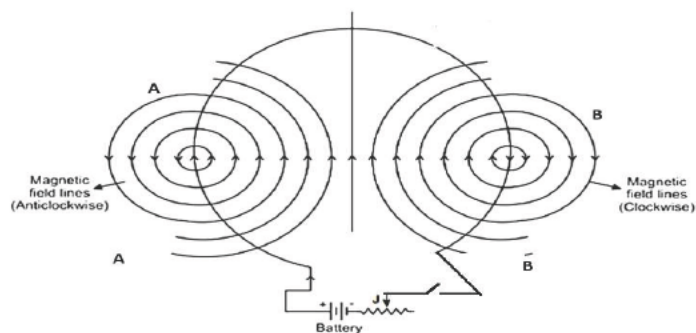
8. LEDs have longer life as compared to incandescent lamps.

LED require low operational voltage and less power as compared to incandescent lamps.

9.

Bar Magnet	Electro Magnet (Current carrying Solenoid)
a, d	b, c

10.



Question 11 to 15 each carry 3 mark.

11.a) Motor Principle

b) Voice coil and Diaphragm.

c) Electrical energy >> Sound energy or Electrical >> Mechanical >> Sound

12.a) Decrease

b) On increasing the distance between the coils, then the length of the solenoid increases but the number of turns per unit length of coils will decrease. Due to a decrease in the number of turns per unit length, the magnetic fields per unit area decreases. And hence the intensity of the magnetic field gets decreases.

13.a) Tungsten.

b) High resistivity, High melting point, High ductility and ability to emit white light in hot condition- (Any two)

14. (a) —Electrical energy ,

(b) —Electric Iron box ,

(c) —Heating effect ,

(d) —Electric energy to mechanical energy,

(e) — electrical energy to Chemical energy,

(f) —Chemical effect.

15.

Series	Parallel
a,d,f	b,c,e

16.a) Effective resistance

$$R_p = R_1 R_2 / R_1 + R_2 = (2 \times 2) / (2 + 2) = 4 / 4 = 1 \Omega$$

$$\text{OR } R/n = 2/2 = 1 \Omega$$

$$\text{Effective Resistance} = 5 + 1 = 6 \Omega$$

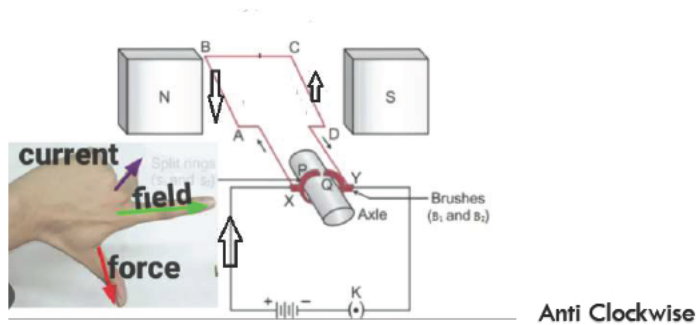
b i)  $I = V/R = 12/6 = 2A$

Volt meter reading means voltage across parallel resistors.

so  $R = 1 \text{ ohm}$ ,  $V = IR = 2 \times 1 = \underline{2 \text{ Volt}}$ .

b ii)  $I = V/R = 12/6 = 2A$

17.a)



b) Based on left hand rule arrange the three fingers and we will get the force direction in the direction of thumb points.

c) The split ring is used to reverse the coil's current direction. The coil's current must be reversed in order for it to continue rotating in the same direction. As a result, the direction of the couple rotating the coil remains the same after every half rotation, and the coil continues to rotate in the same direction.

18a) Alloy of Tin and Lead.

b) Low melting point.

- c) >Be sure the power is off in the circuit  
 >Use an identical replacement fuse if possible.  
 >Fuse wire should not project out.  
 >The ends must be fix tightly.  
 >Be certain the fuse properly fits the fuse holder. (Any two)

19a) North pole

b) Change the direction of current OR reverse the battery connection.

c) Increase the current , Increase the number of turns ,Increase the area of cross section of soft iron core if it used .

20a) Joule's Law states that when a current flows in a conductor the amount of heat generated is proportional to current, resistance, and time in the current flowing. Let us have a look at the concept behind the joule's law.

<p>b) <math>H = I^2 R t</math></p> <p><math>= 0.3^2 \times 200 \times 300</math></p> <p><math>= 0.09 \times 60000 = 5400J</math></p> <p><math>5400J = 5400 / 4.18 \text{ calorie}</math></p> <p><u><math>= 1291.8 \text{ calorie}</math></u></p>	<p><math>R = 200 \Omega</math></p> <p><math>I = 0.3A</math></p> <p><math>t = 5 \text{ min} = 300s</math></p>
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