Formula Sheet Competion-03

Fill the form carefully

https://forms.gle/14KPefVDfe5M368b7

- ❖Submit the form before 9.Aug.2020, 11: 00 am.
- ❖ You can submit your sheet in image format only(max 3 pages)
- ❖ We will consider only form entries.
- ❖Don’t send sheet on any of our email id.
- ❖BE CAREFUL FORM CAN BE SUBMITTED ONLY ONCE.

Ch—03 Current Electricity

Daily Practice Problem 11

Q1. An electric bulb is marked 100 W, 230 V. If the supply voltage drops to 115 V, what is the heat and light energy produced by the bulb in 20 min? Calculate the current flowing through it.

Q2. Two ribbons are given with the following particulars:

Ribbon	A	B
Alloy	Constantan	Nichrome
Length (m)	5.456	4.235
Width (mm)	1.0	2.0
Thickness (mm)	0.03	0.06
Temp. coefficient of resistivity ($°C^{-1}$)	Negligible	Negligible
Resistivity (Ωm)	4.9 x 10^{-7}	1.1 x 10^{-6}

For a fixed voltage supply, which of the two ribbons corresponds to a greater rate of heat production?

Q3. A copper electric kettle weighing 1000 g contains 900 g of water at 20°C. It takes 12 minutes to raise the temperature to 100°C. If electric energy is supplied at 210 V, calculate the strength of the current, assuming that 10% heat is wasted. Specific heat of copper is 0.1.

Q4. An electric kettle has two heating coils, when one of the coils is switched on, the kettle begins to boil in 6 minutes and when the other is switched on, the boiling begins in 8 minutes. In what time will the boiling begin if bola the coils are switched on simultaneously **(i)** in series and **(ii)** in parallel?

Q5. A coil of enameled copper wire of resistance 50 Ω is embedded in a block of ice and a potential difference of 210 V applied across it. Calculate the rate at which ice melts. Latent heat of ice is 80 cal per gram.

Q6. A 24 V battery of internal resistance 4.0 Ω is connected to a variable resistor. At what value of the current drawn from the battery is the rate of heat produced in the resistor maximum?

Q7. A dry cell of emf 1.5 V and internal resistance 0.10 Ωis connected across a resistor in series with a very low resistance ammeter. When the circuit is switched on, the ammeter reading settles to a steady value of 2.0 A, what is the steady

(a) rate of chemical energy consumption of the cell,

(b) rate of energy dissipation inside the cell,

(c) rate of energy dissipation inside the resistor,

(d) power output of the source?

Q8. Two batteries, each of emf ϵ and internal resistance r, are connected in parallel. If we take current from this combination in an external resistance R, then for what value of R maximum power will be obtained? What will be this power?

Q9. A fuse with a circular cross-sectional radius of 0.15 mm blows at 15 A. What should be the radius of cross-section of a fuse made of the same material which will blow at 30 A?

Q10. Why Electric Current is transmitted at High Voltages.?

ANSWERS

1. $\frac{5}{23}$ A

2. Nichrome ribbon

3. 2.469 A

4.(i) 14 mins **(ii)** 3.43 mins

5. 2.62 cal g^{-1}

6. 3.0 A

7.(a) 3.0 W **(b)** 0.40 W

(c) 2.6 W **(d)** 2.6 W

8. $R = \frac{r}{2}$, $P_{max} = \frac{\epsilon^2}{2r}$

9. 0.24 mm