1. **In an electrical cable there is a single wire of radius 9 *mm* of copper. Its resistance is . The cable is replaced by 6 different insulated copper wires, the radius of each wire is . Now the total resistance of the cable will be**

(a)  (b)  (c)  (d) 

1. **Two uniform wires  and  are of the same metal and have equal masses. The radius of wire  is twice that of wire . The total resistance of *A* and  when connected in parallel is**

(a)  when the resistance of wire  is 

(b)  when the resistance of wire  is 

(c)  when the resistance of wire  is 

(d)  when the resistance of wire  is 

1. **Twelve wires of equal length and same cross-section are connected in the form of a cube. If the resistance of each of the wires is , then the effective resistance between the two diagonal ends would be**

(a) 2

(b) 12

(c) 

(d) 8

1. **You are given several identical resistances each of value  and each capable of carrying maximum current of 1 ampere. It is required to make a suitable combination of these resistances to produce a resistance of  which can carry a current of 4 amperes. The minimum number of resistances of the type  that will be required for this job**

(a) 4 (b) 10 (c) 8 (d) 20

1. **The resistance of a wire is  per metre. It is bend in the form of a circle of diameter . A wire of the same material is connected across its diameter. The total resistance across its diameter *AB* will be**

*A*

*B*

(a)  (b)  (c)  (d) 

1. **In the figure shown, the capacity of the condenser *C* is . The current in  resistor is**

6*V*

2*.*8Ω

*+*

*–*

2*μF*

4Ω

3Ω

2Ω

(a) 9 *A* (b) 0.9 *A*

(c)  (d) 

1. **When the key *K* is pressed at time , which of the following statements about the current *I* in the resistor *AB* of the given circuit is true**

*B*

1000Ω

*C*

1*μF*

*A*

*K*

2*V*

1000Ω

(a) *I* = 2 *mA*  at all *t*

(b) *I* oscillates between 1 *mA* and 2*mA*

(c) *I* = 1 *mA* at all *t*

(d) At *t* = 0 , *I* = 2 *mA* and with time it goes to 1 *mA*

1. **A torch bulb rated as 4.5 *W*, 1.5 *V* is connected as shown in the figure. The *e.m.f.* of the cell needed to make the bulb glow at full intensity is**

*E*(*r=*2*.*67Ω)

1Ω

4*.*5 *W*

1*.*5 *V*

(a) 4.5 *V*

(b) 1.5 *V*

(c) 2.67 *V*

(d) 13.5 *V*

1. **In the circuit shown in the figure, the current through**

9 *V*

8Ω

8Ω

2Ω

3Ω

2Ω

2Ω

2Ω

2Ω

4Ω

(a) The 3Ω resistor is 0.50*A* (b) The 3Ω resistor is 

(c) The 4Ω resistor is 0.50*A* (d) The 4Ω resistor is 

1. **There are three resistance coils of equal resistance. The maximum number of resistances you can obtain by connecting them in any manner you choose, being free to use any number of the coils in any way is**

(a) 3 (b) 4 (c) 6 (d) 5

1. **In the circuit shown, the value of each resistance is *r*, then equivalent resistance of circuit between points *A* and *B* will be**

*A*

*B*

*C*

*r*

*r*

*r*

*r*

*r*

*r*

*r*

(a) (4/3) *r*

(b) 3*r* / 2

(c) *r* / 3

(d) 8*r* / 7

1. **In the circuit shown here, *E*1 = *E*2 = *E*3 = 2 *V* and *R*1 = *R*2 = 4 *ohms*. The current flowing between points *A* and *B* through battery *E*2 is**

*R*1

*R*2

*B*

*A*

*E*1

*E*3

*E*2

(a) Zero

(b) 2 *amp* from *A* to *B*

(c) 2 *amp* from *B* to *A*

(d) None of the above

1. **In the circuit shown below E1 = 4.0 V, R1= 2 Ω, E2 = 6.0 V, R2 = 4 Ω and R3 = 2 Ω. The current I1 is**

*E*1*=* 4 *V*

*R*1 *=* 2Ω

*I*2

*I*1

*E*2*=* 6 *V*

*R*3 *=* 2Ω

*R*2 *=* 4Ω

(a) 1.6 *A*

(b) 1.8 *A*

(c) 1.25 *A*

(d) 1.0 *A*

1. **A microammeter has a resistance of  and full scale range of . It can be used as a voltmeter or as a higher range ammeter provided a resistance is added to it. Pick the correct range and resistance combination**

(a) 50 *V* range with  resistance in series

(b) 10 *V* range with  resistance in series

(c) 10 *mA* range with  resistance in parallel

(d) 10 *mA* range with  resistance in parallel

1. **The potential difference across 8 *ohm* resistance is 48 *volt* as shown in the figure. The value of potential difference across *X* and *Y* points will be**

3Ω

20Ω

30Ω

60Ω

8Ω

24Ω

48*V*

*X*

*Y*

1Ω

(a) 160 *volt*

(b) 128 *volt*

(c) 80 *volt*

(d) 62 *volt*

1. **The equivalent resistance between the points *P* and *Q* in the network given here is equal to (given )**

*r*

*r*

*r*

*r*

*r*

*r*

*r*

*r*

*P*

*Q*

(a) 

(b) 1 Ω

(c) 

(d) 2 Ω

1. **The current in a conductor varies with time *t* as  where *I* is in *ampere* and *t* in *seconds*. Electric charge flowing through a section of the conductor during *t* = 2 *sec* to *t* = 3 *sec* is**

(a) 10 *C* (b) 24 *C* (c) 33 *C* (d) 44 *C*

1. **A group of *N* cells whose *emf* varies directly with the internal resistance as per the equation *E*N = 1.5 *rN* are connected as shown in the figure below. The current *I* in the circuit is**

*r*1

*r*2

*r*3

*r*4

*rN*

1

2

3

4

*N*

(a) 0.51 *amp*

(b) 5.1 *amp*

(c) 0.15 *amp*

(d) 1.5 *amp*

1. **In the shown arrangement of the experiment of the meter bridge if *AC* corresponding to null deflection of galvanometer is *x*, what would be its value if the radius of the wire *AB* is doubled**

*B*

*R*1

*C*

*R*2

*A*

***G***

*x*

(a) *x*

(b) *x*/4

(c) 4*x*

(d) 2*x*

1. **The resistance of a wire of iron is 10 *ohms* and temp. coefficient of resistivity is . At  it carries 30 *milliamperes* of current. Keeping constant potential difference between its ends, the temperature of the wire is raised to . The current in *milliamperes* that flows in the wire is**

(a) 20 (b) 15 (c) 10 (d) 40

1. **Seven resistances are connected as shown in the figure. The equivalent resistance between *A* and *B* is**

5Ω

10Ω

8Ω

6Ω

6Ω

3Ω

10Ω

*A*

*B*

(a) 3 Ω

(b) 4 Ω

(c) 4.5 Ω

(d) 5 Ω

1. **A battery of internal resistance 4Ω is connected to the network of resistances as shown. In order to give the maximum power to the network, the value of *R* (in ) should be**

*R*

*E*

*R*

*R*

*R*

*R*

6*R*

4*R*

(a) 4/9

(b) 8/9

(c) 2

(d) 18

1. **In the circuit shown here, the readings of the ammeter and voltmeter are**

6 *V,* 1Ω

4Ω

6Ω

***A***

***V***

(a) 6 *A,* 60 *V*

(b) 0.6 *A,* 6 *V*

(c) 6/11 *A,* 60/11 *V*

(d) 11/6 *A,* 11/60 *V*

1. **Length of a hollow tube is 5*m*, it’s outer diameter is 10 *cm* and thickness of it’s wall is 5 *mm*. If resistivity of the material of the tube is 1.7 × 10–8 Ω×*m* then resistance of tube will be**

(a) 5.6 × 10–5 Ω (b) 2 × 10–5 Ω (c) 4 × 10–5 Ω (d) None of these

1. **A wire of resistor *R* is bent into a circular ring of radius *r*. Equivalent resistance between two points *X* and *Y* on its circumference, when angle *XOY* is *α*, can be given by**

*X*

*W*

*Y*

*O*

*α*

*Z*

(a) 

(b) 

(c) *R* (2*π* – *α*)

(d) 

1. **Potential difference across the terminals of the battery shown in figure is (*r* = internal resistance of battery)**

(a) 8 *V*

10 *V*

4Ω

*r* =1Ω

(b) 10 *V*

(c) 6 *V*

(d) Zero

1. **As the switch *S* is closed in the circuit shown in figure, current passed through it is**

4Ω

2Ω

*B*

*S*

2Ω

5 *V*

*A*

20 *V*

(a) 4.5 *A*

(b) 6.0 *A*

(c) 3.0 *A*

(d) Zero

1. **In the following circuit a 10 *m* long potentiometer wire with resistance 1.2 *ohm/m*, a resistance *R*1 and an accumulator of emf 2 *V* are connected in series. When the emf of thermocouple is 2.4 *mV* then the deflection in galvanometer is zero. The current supplied by the accumulator will be**

*i*

*B*

+

–

*R*1

Cold Junction

Hot Junction

*A*

5 *m*

***G***

(a) 4 × 10–4 *A*

(b) 8 × 10–4 *A*

(c) 4 × 10–3 *A*

(d) 8 × 10–3 *A*

1. In the following circuit, bulb rated as 1.5 *V*, 0.45 *W*. If bulbs glows with full intensity then what will be the equivalent resistance between *X* and *Y*

*R*

*Y*

6 *V*

3Ω

*X*

*B*

(a) 0.45 Ω

(b) 1 Ω

(c) 3 Ω

(d) 5 Ω

1. **A moving coil galvanometer has 150 equal divisions. Its current sensitivity is 10 *divisions per milliampere* and voltage sensitivity is 2 *divisions per millivolt*. In order that each division reads 1 *volt*, the resistance in ohms needed to be connected in series with the coil will be**

(a) 99995 (b) 9995 (c)  (d) 