No. of Printed Pages/Questions:3/12

O.P.JINDAL SCHOOL, SAVITRI NAGAR
PERIODIC TEST –I (Round-2) **(2026-27)**

CLASS-XII **MAX.MARKS-20**

SUBJECT-PHYSICS **MAX.TIME-1 Hour**

General Instruction:-

(i)All questions are compulsory .There are 12 questions in this question paper with internal choice.

(ii) SECTION –A: Question numbers 1 to 5 are MCQs , and question number 6 is assertion and reason carrying 1 mark each.

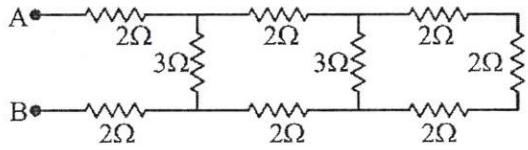
(iii) SECTION –B: Question numbers 7 to 10 are short answer questions carrying 2 marks each.

(iv) SECTION –C: Question numbers 11 and 12 are long questions carrying 3marks each.

(v)There will be internal choices in some of the question of section B and section C.

SECTION A

Q1. The effective resistance between A and B in the given circuit is



(a)20Ω (b)2Ω
(c)3Ω (d)6Ω

Q2. By increasing the temperature, the specific resistance of a conductor and a semiconductor
(a) increases for both
(b) decreases for both
(c) increases for a conductor and decreases for a semiconductor
(d) decreases for a conductor and increases for a semiconductor

Q3. The current in a device varies with time t as I = 6t, where t is in mA and t is in s. The amount of charge that passes through the device during t=0 s to 3 s is
(a) 10mC (b) 18mC
(b) 27mC (d) 54mC

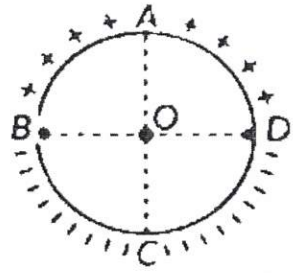
Q4. A proton is taken from point P_1 to point P_2, both located in an electric field. The potentials at points P_1 and P_2 are -5 V and +5 V respectively. Assuming that kinetic energies of the proton at points P, and P_2 are zero, the work done on the proton is
(a)-1.6×10^{-18} J (b) 1.6×10^{-18} J
(c)Zero (d)0.8×10^{-18} J

Q5. Three capacitors, each of 4 μF are to be connected in such a way that the effective capacitance of the combination is 6 μF. This can be achieved by connecting.

(a) All three in parallel
(b) All three in series
(c) Two of them connected in series and the combination in parallel to the third.
(d) Two of them connected in parallel and the combination in series to the third.

Q6. Assertion (A) and Reason (R) type questions. Given below are the two statements labelled as Assertion (A) and Reason (R). Select the most appropriate answer from the options given below.

Assertion (A): Equal amount of positive and negative charges are distributed uniformly on two halves of a thin circular ring as shown in figure. The resultant electric field at the centre O of the ring is along OC.



Reason (R): It is so because the net potential at O is not zero.

(a) Both (A) and (R) are true and (R) is correct explanation of (A).
(b) Both (A) and (R) are true, and (R) is not correct explanation of (A).
(c) (A) is true but (R) is false.
(d) Both (A) and (R) are false.

SECTION B

Q7. Show that the resistance of conductor can be expressed by $R = \frac{ml}{ne^2\tau A}$, where symbols have their usual meanings.

Q8. Attempt either (A) or (B):

(A):

Two conductors, made of the same material have equal lengths but different cross-sectional areas A_1 and A_2 $(A_1 > A_2)$. They are connected in parallel across a cell. Show that the drift velocities of electrons in two conductors are equal.

OR

(B):

A battery of e.m.f. 12 V and internal resistance 0.5 Ω is connected to a 9.5 Ω resistor through a key. Find the ratio of potential difference between the two terminals of the battery, when the key is open to that when the key is closed ?

Q9. Attempt either (A) or (B):

(A):

The magnitude of electric field (in N C^{-1}) in a region varies with the distance r (in m) as

$$E = 10r + 5$$

By how much does the electric potential increase in moving from point r = 1 m to a point at r = 10 m.

OR

(B):

The capacitance of a parallel plate capacitor with air as medium is 6 μF. With the introduction of a dielectric medium, the capacitance becomes 30 μF. Find the permittivity of the medium? ($\varepsilon_o = 8.85\times10^{-12}C^2N^{-1}m^{-2}$)

Q10. Write two important characteristics of equipotential surfaces.

SECTION C

Q11. Attempt either (A) or (B):

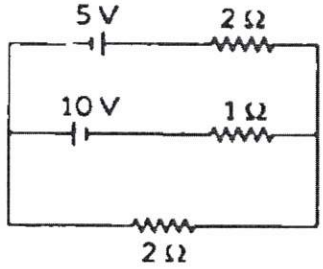
(A):

What is the difference between 'emf and 'terminal voltage' of a cell? Two cells of emfs E_1 and E_2 and internal resistances r_1 and r_2 are connected in parallel. Derive an expression for the emf and internal resistance of the equivalent cell.

OR

(B):

State Kirchhoffs laws. Apply these laws to find the values of current flowing in the three branches of the given circuit.



Q12.Attempt either (A) or (B):

(A):

A system of two conductors is placed In air and they have net charge of +80 μC and -80 μC which causes a potential difference of 16 V between them.

(iii) Find the capacitance of the system.

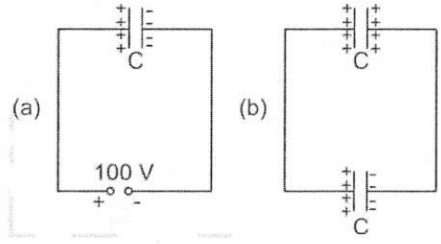
(ii) If the air between the capacitor Is replaced by a dielectric medium of dielectric constant 3, what will be the potential difference between the two conductors?

(iii) If the charges on two conductors are changed to +160 μC and 160 μC, will the capacitance of the system change? Give reason for your answer.

OR

(B):

A capacitor of capacitance C = 900pF is charged fully by 100 V battery as shown in the figure (a). Then it is disconnected from the battery and connected to another uncharged capacitor of capacitance C = 900pF as shown in figure (b). Find the electrostatic energy stored by the system in (b).



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Rishi Raj