

PART 1 - PHYSICS

Topic : Electrostatic potential and capacitance

SECTION-1 : (Maximum Marks : 4)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +4	ONLY if (all) the correct option(s) is(are) chosen;
Partial Marks	: +3	If all the four options are correct but ONLY three options are chosen;
Partial Marks	: +2	If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks	: +1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: -2	In all other cases.
- For example, in a question, if **(A), (B) and (D)** are the ONLY three options corresponding to correct answers, then choosing ONLY (A), (B) and (D) will get +4 marks; choosing ONLY (A) and (B) will get +2 marks; choosing ONLY (A) and (D) will get +2 marks; choosing ONLY (B) and (D) will get +2 marks; choosing ONLY (A) will get +1 mark; choosing ONLY (B) will get +1 mark; choosing ONLY (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -2 marks.

1. A positive point charge of 10^{-8} C is kept at a distance of 20 cm from the center of a neutral conducting sphere of radius 10 cm. The sphere is then grounded and the charge on the sphere is measured. The grounding is then removed and subsequently the point charge is moved by a distance of 10 cm further away from the center of the sphere along the radial direction. Taking $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$ (where ϵ_0 is the permittivity of free space), which of the following statements is/are correct:

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- (A) Before the grounding, the electrostatic potential of the sphere is 450 V.
 (B) Charge flowing from the sphere to the ground because of grounding is 5×10^{-9} C.
 (C) After the grounding is removed, the charge on the sphere is -5×10^{-9} C.
 (D) The final electrostatic potential of the sphere is 300 V.

Scan or tap for the full solution



Space for Rough Work

JEE ADVANCED ELECTROSTATIC POTENTIAL AND CAPACITANCE — ELECTROSTATICS OF CONDUCTORS — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-1																	
Ques.	1																
Ans.	A, B, C																