CLASS PRACTICE TEST-2

NAME OF STUDENT …… ROLL. NO……BATCH…… DATE……

M.M:30 CPT-CBSE PHYSICS XII TIME:1:30

TOPICS: CHAPTER 2 POTENTIAL & CAPACITANCE

OBJECTIVE SECTION (+1)

1. Capacitance of a parallel plate capacitor becomes 4/3 times its original value if a dielectric slab of thickness $t = d/2$ is inserted between the plates (d is the separation between the plates). The dielectric constant of the slab is

   (a) 8 (b) 4 (c) 6 (d) 2

2. The work done in placing a charge of 8×10^{-18} *coulomb* on a condenser of capacity 100 *micro-farad* is

   (a) 32×10^{-32} *joule* (b) 16×10^{-32} *joule* (c) 3.1×10^{-26} *joule* (d) 4×10^{-10} *joule*

3. Capacitance (in *F*) of a spherical conductor with radius $1\ m$ is

   (a) 1.1×10^{-10} (b) 10^{-6} (c) 9×10^{-9} (d) 10^{-5}

4. If the distance between parallel plates of a capacitor is halved and dielectric constant is doubled then the capacitance

   (a) Decreases two times (b) Increases two times (c) Increases four times (d) Remain the same

5. The capacity of a condenser is 4×10^{-6} *farad* and its potential is 100 *volt*. The energy released on discharging it fully will be

   (a) 0.02 *joule* (b) 0.04 *joule* (c) 0.025 *joule* (d) 0.05 *joule*

6. A 0.2 μF capacitor is charged to 600 *V*. After removing it from battery it is connected to another capacitor of 1μF in parallel. The voltage on the capacitor will become

   (a) 300 *V* (b) 600 *V* (c) 100 *V* (d) 120 *V*

7. Three capacitors of capacitance 3μF, 10μF and 15 μF are connected in series to a voltage source of 100 *V*. The charge on 15 μF is

   (a) 25 μC (b) 100 μC (c) 200 μC (d) 280 μC

8. Two condensers of capacity 0.3 μF and 0.6 μF respectively are connected in series. The combination is connected across a potential of 6 *volts*. The ratio of energies stored by the condensers will be

   (a) $\frac{1}{2}$ (b) 2 (c) $\frac{1}{4}$ (d) 4

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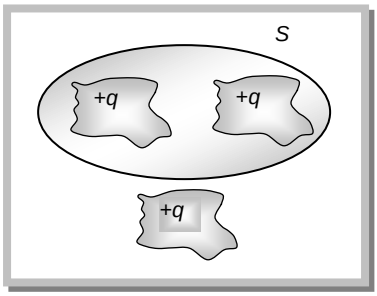
9. 2 μF capacitance has p.d. across its two terminals 200 *volts*. It is disconnected with battery and then another uncharged capacitance is connected in parallel to it, then p.d. becomes 20 *volts*. Then the capacity of another capacitance will be

(a) 2 μF (b) 4 μF (c) 18 μF (d) 16 μF

10. A unit charge is taken from one point to another over an equipotential surface. Work done in this process will be

(a) Zero (b) Positive (c) Negative (d) Optimum

11. Shown below is a distribution of charges. The flux of electric field due to these charges through the surface *S* is



(a) $3q/\varepsilon_0$ (b) $2q/\varepsilon_0$ (c) q/ε_0 (d) Zero

12. If the electric flux entering and leaving an enclosed surface respectively is ϕ_1 and ϕ_2, the electric charge inside the surface will be

(a) $(\varphi_1+\varphi_2)\varepsilon_0$ (b) $(\varphi_2-\varphi_1)\varepsilon_0$ (c) $(\varphi_1+\varphi_2)/\varepsilon_0$ (d) $(\varphi_2-\varphi_1)/\varepsilon_0$

13. A hollow conducting sphere of radius *R* has a charge (+*Q*) on its surface. What is the electric potential within the sphere at a distance $r=\frac{R}{3}$ from its centre

(a) Zero (b) $\frac{1}{4\pi\varepsilon_0}\frac{Q}{r}$ (c) $\frac{1}{4\pi\varepsilon_0}\frac{Q}{R}$ (d) $\frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}$

14. The radius of a soap bubble whose potential is 16 *V* is doubled. The new potential of the bubble will be

(a) 2 *V* (b) 4 *V* (c) 8 *V* (d) 16 *V*

15. A unit charge is taken from one point to another over an equipotential surface. Work done in this process will be

(a) Zero (b) Positive (c) Negative (d) Optimum

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16. Two electric charges 12 μC and – 6 μC are placed 20 *cm* apart in air. There will be a point *P* on the line joining these charges and outside the region between them, at which the electric potential is zero. The distance of *P* from – 6 μC charge is

(a) 0.10 *m* (b) 0.15 *m* (c) 0.20 *m* (d) 0.25 *m*

17. Two charges of 4 μC each are placed at the corners *A* and *B* of an equilateral triangle of side length 0.2 *m* in air. The electric potential at *C* is $\left(\frac{1}{4\pi\varepsilon_0} = 9\times10^9 \frac{N-m^2}{C^2}\right)$

(a) 9×10^4 *V* (b) 18×10^4 *V* (c) 36×10^4 *V* (d) 36×10^4 *V*

18. A hollow metal sphere of radius 5 *cm* is charged such that the potential on its surface is 10 *V*. The potential at a distance of 2 *cm* from the centre of the sphere

(a) Zero (b) 10 *V* (c) 4 *V* (d) 10/3 *V*

19. Three charges $2q$, $-q$, $-q$ are located at the vertices of an equilateral triangle. At the centre of the triangle

(a) The field is zero but potential is non-zero (b) The field is non-zero but potential is zero

(c) Both field and potential are zero (d) Both field and potential are non-zero

20. A charge *q* is located at the centre of a cube. The electric flux through any face is

(a) $\frac{4\pi q}{6(4\pi\varepsilon_0)}$ (b) $\frac{\pi q}{6(4\pi\varepsilon_0)}$ (c) $\frac{q}{6(4\pi\varepsilon_0)}$ (d) $\frac{2\pi q}{6(4\pi\varepsilon_0)}$

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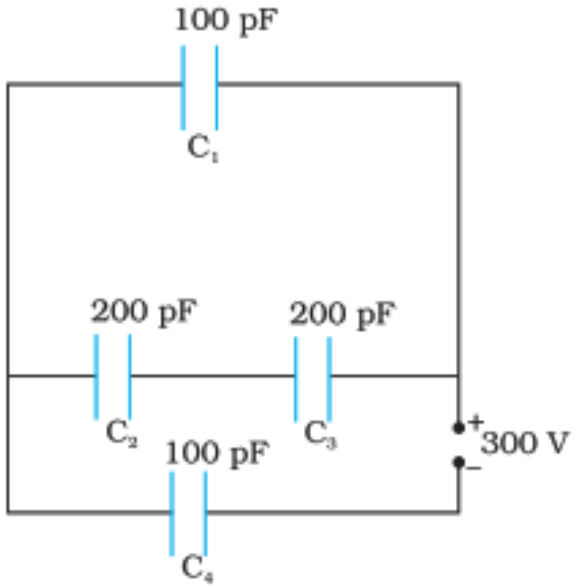
SUJECTIVE SECTION (2X5)

1. Derive the expression for capacitance of PPC with a dielectric slab of t thickness and constant K.
2. Find the charge on each capacitor of given network.

Obtain the equivalent capacitance of the network in Fig. 2.35. For a 300 V supply, determine the charge and voltage across each capacitor.



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ANSWER KEYS

1.	2.	3.	4.	5.	6	7	8	9	10
D	B	A	C	A	C	C	B	C	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	B	C	C	A	C	C	B	B	B

CODES

1.	2.	3.	4.	5.	6	7	8	9	10
172 D	174 B	176 A	180 C	190 A	231 C	240 C	244 B	255 C	 A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
145 B	147B	45 C	49C	50A	52C	53C	59B	64B	146B

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