Enthusiast, Leader & Achiever Course

PHASE : (All Phase)

TARGET : PRE-MEDICAL 2020

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 31-05-2020

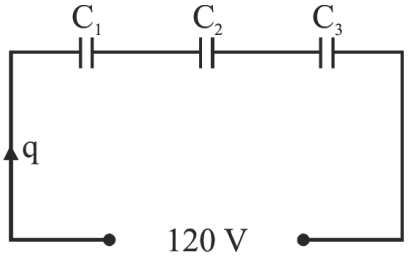
Q.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.	1	4	3	4	2	3	2	4	2	1	2	4	1	3	2	2	2	1	2	2	1	3	4	4	4	1	1	1	2	3
Q.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
A.	1	3	3	4	2	1	1	3	1	3	2	2	1	1	1	1	3	2	1	2	1	1	3	2	3	3	3	2	3	3
Q.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
A.	4	1	4	1	3	2	2	3	2	2	1	2	3	2	3	3	4	3	1	4	1	3	4	2	3	2	1	3	1	1
Q.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
A.	1	1	4	4	2	3	2	4	2	2	1	4	1	3	4	2	2	2	4	2	2	2	1	1	2	3	2	2	2	4
Q.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
A.	4	1	2	3	4	4	2	4	2	1	4	1	4	1	2	1	2	3	3	3	1	4	1	3	1	4	1	3	1	4
Q.	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
A.	2	3	3	1	3	3	1	1	2	1	1	3	3	3	1	3	3	2	4	1	2	2	3	3	2	1	1	4	4	4

HINT – SHEET

1. Ans (1)

$$\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} = \frac{1}{9} + \frac{1}{9} + \frac{1}{9}$$

$$\frac{1}{C_s} = \frac{3}{9} \Rightarrow C_s = 3\text{pF}$$



Charge, $q = C_s V = 3 \times 120 = 360$ pC

Potential difference across C_1, $(V_1) = \frac{q}{C_1}$

$= \frac{360}{9} = 40\text{V} = V_2 = V_3$

2. Ans (4)

Resistance of ideal ammeter is zero so potential drop also zero.

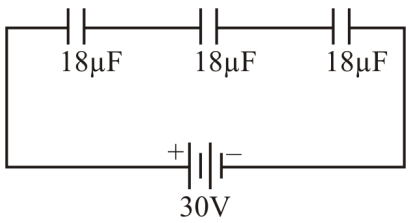
3. Ans (3)

$i = (10^{19} \times 2 \times 1.6 \times 10^{-19}) + (10^{19} \times 1.6 \times 10^{-19}) + 10^{19} \times 1.6 \times 10^{-19} = 6.4$ A

4. Ans (4)

6 μF, 4 μF and 8 μF are connected in parallel combination.

So circuit is



So potential drop is 10 V & charge on 4 μF is

$q = (4\ \mu\text{F}) \times 10\text{V} = 40\ \mu\text{C}$

5. Ans (2)

$R' = n^2R, \quad n = 2$

6. Ans (3)

$$\text{Reading of voltmeter} = \frac{\frac{E_1}{r_1} + \frac{E_2}{r_2}}{\frac{1}{r_1} + \frac{1}{r_2}} = \frac{E_1 r_2 + E_2 r_1}{r_1 + r_2}$$

$= 14$ volt

7. Ans (2)

Net capacitance = $\frac{1}{\left(\frac{1}{2}+\frac{1}{3}+\frac{1}{6}\right)} = 1\mu F$

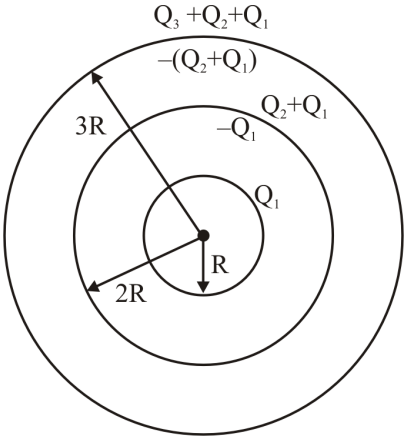
Total charge = CV = 1 μF × 10V = 10 μF

8. Ans (4)

In case of stretching of wire $R \propto \ell^2$

⇒ If length becomes 3 times so Resistance becomes 9 times i.e., R' = 9 × 20 = 180 Ω.

9. Ans (2)



Charge at outer surface of shell of radius R = Q_1

Charge density $\sigma = \frac{Q_1}{4\pi R^2}$ ...(1)

Induced charge inside shell of radius 2R = $-Q_1$

So charge outside it is $Q_2 + Q_1$

Surface charge density $\sigma = \frac{Q_2+Q_1}{4\pi(2R)^2}$ ... (2)

By (1) & (2)

$Q_2 = 3Q_1$

Induced charge inside shell of radius 3R is $-(Q_2 + Q_1)$

So charge outside it is $Q_3 + Q_2 + Q_1$

Surface charge density $\sigma = \frac{Q_3+Q_2+Q_1}{4\pi(3R)^2}$ ...(3)

by equation (1), (2) and (3)

$Q_3 = 5Q_1$

So $Q_1 : Q_2 : Q_3 :: 1 : 3 : 5$

10. Ans (1)

A cell of constant emf = E and internal resistance r is connected to R_1 then

Power $P = \left(\frac{E}{R_1+r}\right)^2 R_1$ ....(1)

If cell is connected to R_2 then

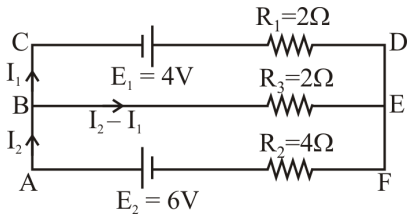
Power $P = \left(\frac{E}{R_2+r}\right)^2 R_2$ ....(2)

If power in both case is same then by equation (1) and (2)

$\frac{R_1}{(R_1+r)^2} = \frac{R_2}{(R_2+r)^2}$

On solving $r = \sqrt{R_1 R_2}$

11. Ans (2)



For loop ABEFA

$-2(I_2 - I_1) - 4I_2 + 6 = 0$ ...(1)

$2I_1 - 6I_2 + 6 = 0$

or $I_1 = 3(I_2 - 1)$ ....(1)

For loop BCDEB

$4 - 2I_1 + 2(I_2 - I_1) = 0$

$4 + 2I_2 - 4I_1 = 0$

$I_2 = 2I_1 - 2$ ...(2)

Put in (1)

$I_1 = 3\{(2I_1 - 2) - 1\}$

$I_1 = 6I_1 - 9$ OR $I_1 = 1.8A$

12. Ans (4)

Since potential difference b/w any two consecutive equipotential surface is same, hence the electric field magnitude will be maximum where separation b/w the surfaces will be minimum.

13. Ans (1)

$I = \frac{5-2}{10+20} = 0.1A$

14. Ans (3)

The combination is equivalent to two capacitors in series, each with plate area A and separation d/2.

$$C_1 = \frac{K_1\varepsilon_0 A}{(d/2)} = \frac{2K_1\varepsilon_0 A}{d}$$

$$C_2 = \frac{K_2\varepsilon_0 A}{(d/2)} = \frac{2K_2\varepsilon_0 A}{d}$$

Further,

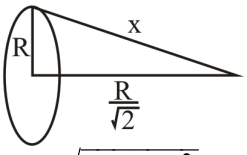
$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} = \frac{d}{2\varepsilon_0 A}\left(\frac{1}{K_1} + \frac{1}{K_2}\right)$$

15. Ans (2)

$$r = R\left(\frac{\ell_1}{\ell_2} - 1\right)$$

$$r = 2\left(\frac{150}{100} - 1\right) = 1 \text{ ohm}$$

16. Ans (2)



$$x = \sqrt{R^2 + \frac{R^2}{2}} = \sqrt{\frac{3}{2}}R$$

17. Ans (2)

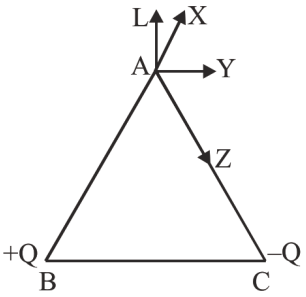
Total flux through a closed surface depends only on charges inside the surface.

18. Ans (1)

$$v_d = \frac{e}{m} \times \frac{V}{l}\tau \text{ or } v_d = \frac{e}{m} \cdot \frac{El}{l}\tau \ [\because V = El]$$

$\therefore\ v_d \propto E$

19. Ans (2)



Direction of electric field towards AY

20. Ans (2)

$$150 = \frac{(15)^2}{R} + \frac{(15)^2}{R} = \frac{450}{R} \Rightarrow R = 3\Omega$$

21. Ans (1)

Metal plate acts as an equipotential surface, therefore the field lines should enter normal to the surface of the metal plate.

22. Ans (3)

$$\vec{\tau} = \vec{P} \times \vec{E},\ \left(\vec{P}\right) = qd$$

$\tau_{max} = P.E = qdE$

$\tau_{max} = 2 \times 10^{-6} \times 0.01 \times 5 \times 10^5$

$= 10 \times 10^{-3}$ Nm

23. Ans (4)

$r_n \propto n^2$

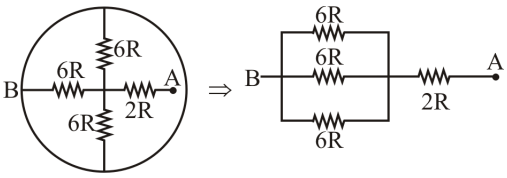
So $r_2 = 2^2 r_1 = 4r_1,\ F \propto \frac{1}{r^2}$

$$\frac{F'}{F} = \frac{r_1^2}{(4r_1)^2} \Rightarrow F' = \frac{F}{16}$$

24. Ans (4)

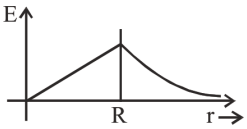
1 Ab – C = 10 C

25. Ans (4)

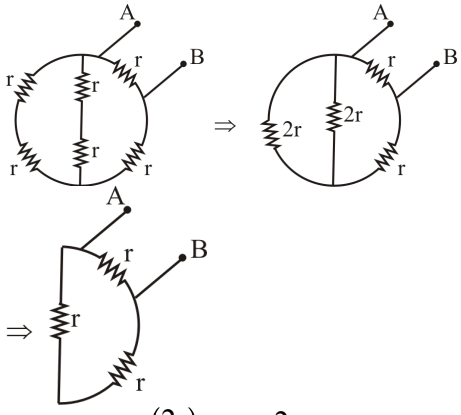


$\Rightarrow R_{AB} = 4R$

26. Ans (1)



27. Ans (1)



$$\Rightarrow R_{AB} = \frac{(2r)r}{2r + r} = \frac{2r}{3}$$

28. Ans (1)

$U_{initial} = \frac{1}{2}CV^2$

$C' = \frac{C}{3}, \; V' = \frac{q}{C'} = \frac{3q}{C} = 3V$

$U_{final} = \frac{1}{2}\left(\frac{C}{3}\right)(3V)^2 = \frac{3CV^2}{2}$

$W = U_{final} - U_{initial} = CV^2$

29. Ans (2)

$V_{small} = \frac{kq}{r}$

If 1000 drops coalesce then charge of big drop Q = 1000 q

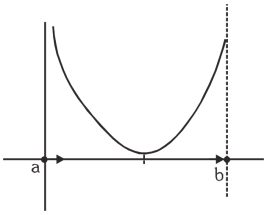
By volume conservation radius of big drop $R = (1000)^{1/3} r = 10 r$

then $V_{big} = \frac{kQ}{R} = \frac{k(1000q)}{10r} = 100 \, V_{small}$

30. Ans (3)

The charge on the plates does not change as the capacitor is disconnected from the battery. The presence of dielectric slab increases the capacitance, which decreases the potential difference. Thus, the energy stored is reduced.

31. Ans (1)



a → +ve

b → –ve

32. Ans (3)

If ammeter is used in place of voltmeter (i.e. in parallel) it may damage due to large current in circuit. Hence to control this large amount of current a high resistance must be connected in series.

33. Ans (3)

$\vec{r}_{AB} = \vec{r}_B - \vec{r}_A = 4\hat{i} + 3\hat{k}$

$V_B - V_A = -\int \vec{E} \cdot d\vec{r} = \vec{E} \cdot \vec{r}_{AB}$

$= -\left(5\hat{i} - 3\hat{j}\right) \cdot \left(4\hat{i} + 3\hat{k}\right)$

$= -20 \; V$

34. Ans (4)

At steady state current in 4μF capacitor and 10 Ω resistance is zero. Potential difference on capacitor will be equal to potential difference on 2Ω resistance.

Now current in 2Ω resistance

$I = \frac{2.5}{2 + 0.5} = 1A$

Potential difference 2Ω = 1 × 2 = 2V

Charge on 4μF q = CV

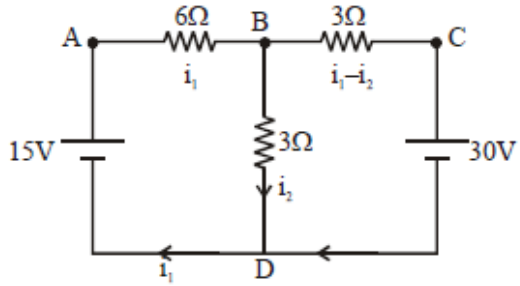
$q = 4 \times 10^{-6} \times 2 = 8 \; \mu C$

35. Ans (2)

470 ± 5%

Hence option (2)

36. Ans (1)



In loop ABCD by KVL

$-6i_1 - 3i_2 + 15 = 0$ or $2i_1 + i_2 = 5$ ..(1)

in loop BCDB

$-3(i_1 - i_2) - 30 + 3i_2 = 0$

$-i_1 + 2i_2 = 10$ ..(2)

from eqⁿ (1) & (2) $i_2 = 5A$

37. Ans (1)

$E_0 = kq\left(\frac{1}{1} + \frac{1}{4} + \frac{1}{16} + \ldots\ldots\infty\right)$

$\Rightarrow \frac{4kq}{3}$

38. Ans (3)

Battery connected i.e. V is same

C ↑ then Q ↑

$Q = CV = 10 \times 12 \times 10^{-6} = 120 \; \mu C$

After filling Liquid C' = 5C

$Q' = 5CV = 5 \times 10 \times 12 \times 10^{-6} = 600 \; \mu C$

Additional charge Q' – Q = 480 μC

39. **Ans (1)**

$$U = \frac{kqQ}{\ell} + \frac{kqQ}{\ell} + \frac{kq^2}{\ell} = 0$$

$$Q = -\frac{q}{2}$$

40. **Ans (3)**

$$U = -\vec{P}.\vec{E} = -PE\cos\theta$$

U is maximum for $\cos\theta = -1$

or $\theta = \pi$

41. **Ans (2)**

Without voltmeter P. D. across 200 Ω is 4volt, and

voltmeter reading is 3 volt.

so error is $\frac{4-3}{4} \times 100 = 25\%$

42. **Ans (2)**

As battery is disconnected, Q remains same.

$$C \text{ increases, } C' = \frac{\varepsilon_0 KA}{d} = KC$$

Potential difference decreases as

$$= V' = \frac{Q'}{C'} = \frac{Q}{KC} = \frac{V}{K}$$

And potential energy is also reduced as

$$U' = \frac{1}{2}C'V'^2 = \frac{1}{2}KC \times \frac{V^2}{K^2} = \frac{U}{K}$$

43. **Ans (1)**

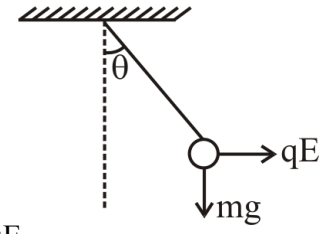
$qE = mg$

$$E = \frac{V}{d} = \frac{800}{2 \times 10^{-2}} = 4 \times 10^4$$

$$q = \frac{mg}{E} = \frac{1.96 \times 10^{-15} \times 9.8}{4 \times 10^4}$$

$q = 4.8 \times 10^{-19} = 3e$

44. **Ans (1)**



$$\tan\theta = \frac{qE}{mg}, \quad E = \frac{\sigma}{2\epsilon_0}$$

$$\tan\theta = \frac{q\sigma}{2\epsilon_0 mg}$$

45. **Ans (1)**

$$V = \frac{k(6Q)}{R} = \frac{6kQ}{R}$$

(potential is scalar)

46. **Ans (1)**

Fact based

55. **Ans (3)**

$X_{(fcc)} \Rightarrow 4$

$Y_{(OHV \text{ and Alternate THV})} \Rightarrow 4 + \frac{1}{2} \times 8 = 8$

$\therefore$ compound is XY_2

60. **Ans (3)**

$$\lambda_{eq} = \frac{\lambda_m}{V.F.} \text{ [V.F. = valency factor]}$$

$$\therefore \lambda_{eq} = \frac{150}{3} = 50 \text{ S cm}^2 \text{ eq}^{-1}$$

68. **Ans (3)**

$$\eta = \frac{\Delta G}{\Delta H} = -\frac{nFE}{\Delta H}$$

70. **Ans (2)**

Mili mol of $AgNO_3 = 0.1 \times V$

Mili mol of $NaCl = 0.2 \times V$

$\therefore$ Mili mol of $NO_3^- = 0.1 \times V$ and total $V = 2V$

$$\therefore [NO_3^-] = \frac{0.1 \times V}{2V} = 0.05$$

74. **Ans (2)**

NCERT-XII, Pg#3, Para-3

76. **Ans (3)**

$N = M \times$ n-factor

$0.3 = M \times 6$

$$M = \frac{0.3}{6} = 0.05 \text{ M}$$

89. **Ans (1)**

(A) has the largest hydrocarbon chain (Hydrophase)

96. **Ans (3)**

NCERT (XIIth) Pg. # (E) 22 (H) 23

97. **Ans (2)**

Module-1, Pg # 119(E), 119(H)

102. **Ans (4)**

NCERT-(XII) Page No. 34

103. Ans (1)
NCERT (XII) Page # 63, Para 5

105. Ans (4)
NCERT Pg. # 133, 134 Fig 7.7 Para 7.4

107. Ans (2)
NCERT = 23

109. Ans (4)
NCERT Pg. # 62, Para- 4.3

112. Ans (2)
NCERT–XII, Pg. # 54

118. Ans (2)
Module Page-141

122. Ans (1)
NCERT(XII) Pg # 129/141(H) Para:7.3

123. Ans (2)
NCERT (XIIth) Pg. # 38

126. Ans (4)
NCERT XII, Pg.# 140,141, para 7.9

129. Ans (2)
NCERT Pg # 126-127, Para 7.1

130. Ans (1)
NCERT Pg.# 64

133. Ans (4)
NCERT XII Page No. 60

143. Ans (1)
NCERT(XII) Pg#130/141(H) Para:7.3

144. Ans (3)
NCERT–XII, Pg. # 25

148. Ans (3)
NCERT–XII, Pg. # 54

149. Ans (1)
NCERT Pg. # 61, Fig. 4.4(b)

151. Ans (2)
NCERT Pg. # 216 (E), 235 (H)

152. Ans (3)
NCERT (XII) Pg. # 61,62

153. Ans (3)
NCERT Page # (E/H) 127,137

154. Ans (1)
NCERT-XII, Pg#35-2.4.1

155. Ans (3)
NCERT (XII) Pg. # 49

157. Ans (1)
NCERT XII Pg. # 45, 50-51

166. Ans (3)
NCERT XII, Page # 64

167. Ans (3)
NCERT-XIIth, Page#47

174. Ans (3)
NCERT (XIIth) Pg. # 133

175. Ans (2)
NCERT (XII) Pg. # 60

177. Ans (1)
NCERT Pg. # 60,61