PHYSICS

BOOKS - PUNJAB BOARD PREVIOUS YEAR PAPERS

Capacitance

Exercise

1. A parallel plate capacitor having area $25 cm^2$

and separation 1.00 mm is Connected to a

battery of 6.0 V. Calculate the charge flown through the battery. How much work has been done by the battery during this process? $\left(Given\, \varepsilon_0 = 8.85 \times 10^{-12} C^2 N^{-1} m^{-2}\right)$

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2. A Parallel plate capacitor with air between plates has a capacitance of $8pF\left(1pF = 10^{-12} F\right)$. What will be the capacitance if the distance between the plates is reduced by half and the space between

them is filled with a substance of dielectric Constant=6?

$$\left(Given \varepsilon_0 = 8.85 \times 10^{-12} C^2 N^{-1} m^{-2}\right)$$

3. In a parallel plate capacitor with air between the plates, each has an area of $6 \times 10^{-3} m^{-2}$ and the distance between the platesw is 3mm. Calculate the capacitance of the capacitor, If this capacitor is Connected to 100 V supply, what is the charge on each plate of the

capacitor?

$$\left(Given \varepsilon_0 = 8.5 \times 10^{-12} C^2 N^{-1} m^{-2}\right)$$

4. What should be the capacitance of a capacitor capable of storing 1J of energy when potential difference of 100V is applied between the plates?

5. A 12 PF (PiCofarad) capacitor is Connected to 50V (volt) battery. How much electrostatic energy is stored in the capacitor?

6. What is the area of the plates of 2 Farad parallel plate capacitor given that the separation between the plate is 0.5 cm (centimeter).

7. Two plates of parallel plate capacitor have an area of $90cm^2$ (centimeter square) each and are separated by 2.5 mm. The capacitor is charged by Connecting it to a 400V (volt) supply. How much electrostatic energy is stored by the capacitor ?

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8. Three capacitors each of capacitance of $2\mu F$ are Connected in parallel across 6V battery.

Find the charge in each capacitor.

9. What is the area of the plates of 2 Farad parallel plate capacitor given that the separation between the plate is 0.5 cm (centimeter).

10. The parallel plates of an air filled capacitor are1.0 mm apart. What must be the area of plates if the capacity is to be 1.0 F ?

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11. Calculate the area of plates of a capacitor of capacity $2\mu F$, with separation 1.77 mm between the plates.

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12. A parallel plate capacitor has a capacity of $6\mu F$ (Micro farad), with air in between the plates and $60\mu F$ (Micro farad) when dielectric medium is introduced.What is the dielectric Constant (K) of the medium ?

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13. A 900 pF (PiCo farad) capacitor is charged by 100 V (Volt) battery How much electrostatic energy is stored by the capacitor ?

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14. A 900 pF (PiCo farad) capacitor is charged by 100 V (Volt) battery The capacitor is now disConnected from the battery and is Connected to another uncharged 900pF (PiCo farad) capacitor. How much is the electrostatic energy stored in the system?

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15. What is one Pico farad?

16. Define capacitance, give its S.I unit.

17. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

18. Three capacitors C_1, C_2, C_3 are Connected in series. Derive an expression for the equivalent capacitance.

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19. What is capacitor? Explain its principle.

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20. Find an expression for the capacity of a metallic sphere.

21. Find an expression for the energy of a charged capacitor.

22. Draw a labelled diagram of Van-de-graaff generator.

23. What is a capacitor? Derive an expression for the evergy stored in a charged capacitor.

24. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

25. What is a capacitor? Derive an expression for capacitance of a parallel plate capacitor.

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26. Derive an expression for energy stored in a capacitor. In which form energy is stored?

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27. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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28. Derive an expression for net capacitance of three cqpacitors in deries Combination.

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29. Derive an expression for energy stored in a capacitor. In which form energy is stored?

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30. What is a capacitor? Derive an expression for the evergy stored in a charged capacitor.

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31. What is spherical capacitor? Derive expression for its capacitance.

32. Define capacitance. of a capacitor. Give its SI unit. Prove that the total electrostatic energy stored in a parallel plate capacitor is $1/2CV^2$?

33. What is a capacitor? Derive an expression for capacitance of a parallel plate capacitor.

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34. Define the capacitance of capacitor. Derive an expression for the capacity of parallel plate capacitor with a dielectric slab placed in between the plates of capacitor.

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35. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

36. Describe the principle, Construction and working of a Van-de-Graff generator with the help of labelled diagram.

37. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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40. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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41. Explain why the capacitance of capacitor increases when dieslectric slab is inserted between plates of the capacitor.

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42. What is a capacitor? Derive an expression for the evergy stored in a charged capacitor.

> ▶ **Watch Video Solution**

43. Describe the principle, Construction and working of a Van-de-Graff generator with the help of labelled diagram.

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44. Define capacitance of a capacitor. Define the SI unit of capacitance.

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45. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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46. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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47. What is a capacitor? Derive an expression for the evergy stored in a charged capacitor.

48. Explain Polarisation of dielectric slab. What is the effect on capacitance if we introduce a dielectric slab of dielectric Constant K in between parallel plate capacitor, thickness of slab is less than the separation between the plates.

49. Derive an expression for capacitance of a parallel plate capacitor.

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50. Describe the principle, Construction and working of a Van-de-Graff generator with the help of labelled diagram.

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51. Explain why the capacitance of capacitor increases when dielectri slab is inserted between the plates of the capacitor. Derive an expression for energy stored in a charged capacitor.

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52. Define the capacitance of capacitor. Derive an expression for the capacity of parallel plate capacitor with a dielectric slab placed in between the plates of capacitor.

53. Derive an expression for the capacitance of

a parallel plate capacitor with dielectric as the

medium between the plates.

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58. What is the principle of capacitor?

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59. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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60. What is dielectric Constant?

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61. Draw a labelled diagram of Van-de-graaff generator.

62. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

63. Describe the principle, Construction and working of a Van-de-Graff generator with the help of labelled diagram.

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64. Explain principal,construction and working of D.C.generator.

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65. What is function of dielectric in capacitor?

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66. What is a capacitor? Derive an expression

for capacitance of a parallel plate capacitor.

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67. A parallel plate capacitor having area

$25cm^2$ and separation 1.00 mm is Connected

to a battery of 6.0 V. Calculate the charge flown through the battery. How much work has been done by the battery during this process?

$\left(Given \varepsilon_0 = 8.85 \times 10^{-12} C^2 N^{-1} m^{-2}\right)$

68. A parallel plate capacitor with air between the plates has a capacitance of 8 pF $\left(1pF = 10^{-12} F\right)$. What will be the capacitance if the distance between the plates is reduced by half, and the space between

them is filled with a substance of dielectric constant 6?

69. In a parallel plate capacitor with air between the plates, each plate has an area of $6 \times 10^{-3} m^2$ and the distance between the plates is 3 mm. Calculate the capacitance of the capacitor. If this capacitor is connected to a 100 V supply, what is the charge on each plate of the capacitor?

70. What should be the capacitance of a capacitor capable of storing 1j of energy when potential difference of 100V is applied between the plates?

71. A 12pF capacitor is connected to a 50V battery. How much electrostatic energy is stored in the capacitor?

72. What is the area of the plates of a 2 F parallel plate capacitor, given that the separation between the plates is 0.5 cm? [You will realise from your answer why ordinary capacitors are in the range of μF or less. However, electrolytic capacitors do have a much larger capacitance (0.1 F) because of very minute separation between the conductors.)

73. The plates of a parallel plate capacitor have an area of $90cm^2$ each and are separated by 2.5 mm. The capacitor is charged by connecting it to a 400 V supply. How much electrostatic energy is stored by the capacitor?

74. Three capacitors each of capacitance of $2\mu F$ are Connected in parallel across 6V

battery. Find the charge in each capacitor.

75. What is the area of the plates of a parallel plate capacitor of capacity 2pF with separation between the plates 0.5 cm?

76. The parallel plates of an air filled capacitor are1.0 mmapart. What must be the area of

plates if the capacity is to be 1.0F ?

77. Calculate the area of plates of a capacitor

of capacity $2\mu F$, with separation 1.77 mm

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80. A 900 pF (PiCo farad) capacitor is charged by 100 V (Volt) battery The capacitor is now disConnected from the battery and is Connected to another uncharged 900pF (PiCo farad) capacitor. How much is the electrostatic energy stored in the system?

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81. What is one Picofarad?

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82. Define capacitance, give its S.I unit.

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83. Give the expression for the energy stored in a capacitor and an indicator.

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84. Three capacitors C_1, C_2, C_3 are Connected in series. Derive an expression for the equivalent capacitance.

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85. What is capacitor? Explain its principle.

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86. Find an expression for the capacity of a metallic sphere.

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87. Find an expression for the energy of a charged capacitor.

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88. With the help of labelled diagram of Van-de-Graaff generator. Explain its principle, construction and working of van-de-Graaff generator.

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89. Find an expression for the energy of a charged capacitor.

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90. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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91. Derive an expression for capacitance of a parallel plate capacitor.

▶ **Watch Video Solution**

92. Give the expression for the energy stored in a capacitor and an indicator.

93. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

94. Derive an expression for net capacitance of three capacitors in series Combination.

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99. Derive an expression for capacitance of a parallel plate capacitor.

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101. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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102. With the help of labelled diagram of Van-de-Graaff generator. Explain its principle, construction and working of van-de-Graaff generator.

103. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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106. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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107. Explain why the capacitance of capacitor increases when dieslectric slab is inserted between plates of the capacitor.

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109. With the help of labelled diagram of Van-de-Graaff generator. Explain its principle, construction and working of van-de-Graaff generator.

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110. Define the SI unit of capacitance.

111. Derive an expression for the capacitance of

a parallel plate capacitor with dielectric as the

medium between the plates.

112. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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113. Derive an expression for capacitance of a parallel plate capacitor.

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114. When a thick plate of a dielectric is place in the air space of a parallel plate capacitor, then

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115. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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116. With the help of labelled diagram of Van-de-Graaff generator. Explain its principle, construction and working of van-de-Graaff generator.

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121. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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122. Define the SI unit of capacitance.

123. With the help of labelled diagram of Van-de-Graaff generator. Explain its principle, construction and working of van-de-Graaff generator.

124. What is capacitor? Explain its principle.

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125. Derive an expression for the capacitance of a parallel plate capacitor with dielectric as the medium between the plates.

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126. Define dielectric Constant of a medium.

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