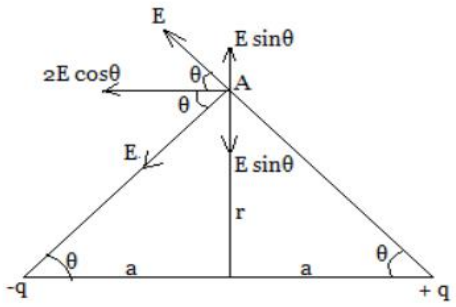
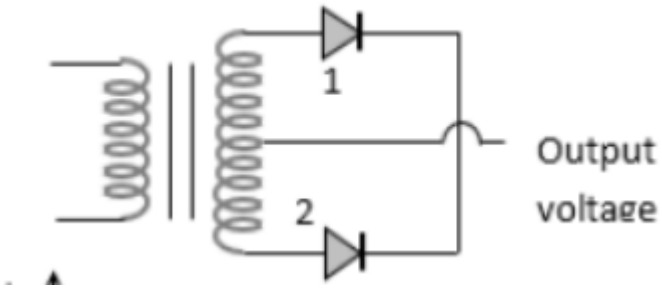
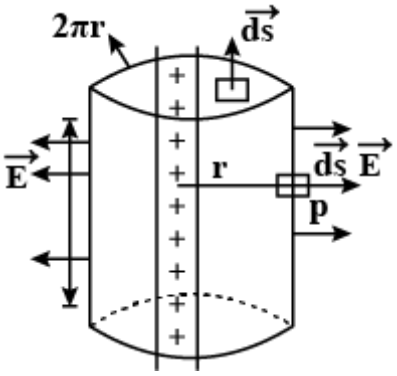
THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

GRADE - XII **10/06/2024**	**MT- 1[2024-2025]** **PHYSICS**	**Max Marks - 20** **TIME – 50 min**

	Section A	
1	(c)3×10^{7} Vm^{-1}	**1**
2	(b) cancels the potential barrier	**1**
3	(c)less than 1	**1**
4	C) Assertion is correct but Reason is incorrect.	**1**
	Section B	
5		**2**

	$E = \frac{1}{4\pi\varepsilon}\frac{p}{(r^2)^{\frac{3}{2}}} = \frac{1}{4\pi\varepsilon}\frac{p}{r^3}$	
6	$\vec{E} = \frac{\vec{F}}{q_0} = \frac{1}{4\,\pi\,\varepsilon_0}\frac{q}{r^2}$ E=E/4 X=6m	**2**
	Section C	
7	Halfwave Rectifier Full wave rectifier  A full-wave rectifier works by initially lowering the voltage of the input AC by using a step-down transformer. The anode of the diodes is connected to the secondary wiring of the transformer. During the half-cycles (the positive and the negative half cycles) any one part of the circuit becomes positive while the other becomes negative. During the positive half cycle of the alternating current, the upper part of the circuit becomes positive, whereas the lower part becomes negative. Due to this, the diode D1$D1$ becomes forward biased and conducts current, whereas the diode D2$D2$ becomes reverse biased and does not conduct current. In the negative half cycle of the alternating current, the diode D1$D1$ becomes reverse biased and does not conduct current,	3

	whereas the diode D2D2becomes reverse biased and conducts current during this cycle.	
	Section D	
8	Electric flux is defined as the measure of count of number of electric field lines crossing an area. Electric flux $\phi = EA\cos\theta$ SI unit of electric flux is Nm2/C The law states that the total flux of the electric field E over any closed surface is equal to 1ε0 times the net charge enclosed by the surface. $\phi = q\varepsilon 0$  The electric flux (ϕ) through curved surface $= \oint Eds\cos\theta$ $\phi = \oint Eds$ [$\because \theta = 0; \cos\theta = 1$] $= E(2r\pi l)$ [The surface area of the curved part is] since $\rightarrow E$ and $\rightarrow ds$ are right angles $2\pi rl$ to each other, the electric flux through the plane caps $= 0$. $\therefore$ Total flux through the Gaussian surface, $\phi = E(2\pi rl)$. The net charge	5

	enclosed by Gaussian surface is, $q=\lambda l$ $\therefore$ By Gauss's law, $=E(2\pi rl)\lambda l\varepsilon_0$ or $E=\lambda 2\pi\varepsilon_0 r$	
	Section E	
	Case Study Based Question: Read the Case Study given below and answer the question that follow:	**1X4=4**
9	1.d 2.c 3.a 4.b Or 4.d	