BENNETT UNIVERSITY
TIMES OF INDIA GROUP

DO NOT WRITE ANYTHING ON QUESTION PAPER EXCEPT YOUR NAME, DEPARTMENT AND ENROLMENT No.

Name of Student ---------- Enrolment No. ----------

Department / School ----------

BENNETT UNIVERSITY, GREATER NOIDA

Mid Term Examination, Fall SEMESTER 2019-20

COURSE CODE: **EPHY203L** MAX. DURATION: **1 hour**

COURSE NAME: **Electrodynamics** MAX. MARKS: **60**

Note :

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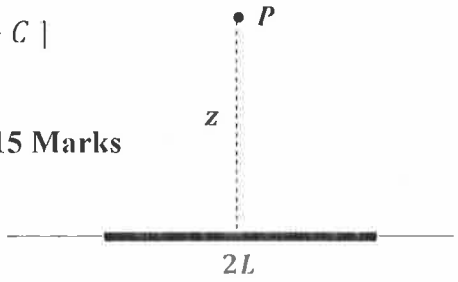
1) Find the electric field inside a sphere that carries a charge density proportional to the distance from the origin, $\rho = k\,r$, where k is a constant.

- 15 Marks

2) Find the potential at a distance z above the center of a line charge of length $2L$ and uniform charge density λ. Also find the electric field from the potential.

[Useful formula: $\int \frac{dx}{\sqrt{x^2+a^2}} = \log|x + \sqrt{x^2+a^2}| + C$]



- 15 Marks

3) A rectangular pipe, running parallel to the x-axis (from $-\infty$ to $+\infty$), has two grounded metal plates at $y = 0$ and $y = a$. The other two sides at $z = b$ and $z = -b$ are maintained at a constant potential V_0. Find the potential inside the pipe.

- 15 Marks

4) The potential at the surface of a sphere of radius R is given by $V_0(\theta) = k\cos\theta$, where k is a constant. Find the potential outside the sphere.

$[\, V(r,\theta) = \sum_{l=0}^{\infty}\left(A_l\, r^l + \frac{B_l}{r^{l+1}}\right) P_l(\cos\theta)\,]$

- 15 Marks
