

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 435

PROBLEM SET 1

1. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the ground state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

2. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the first excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

3. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the second excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

4. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the third excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

5. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the fourth excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

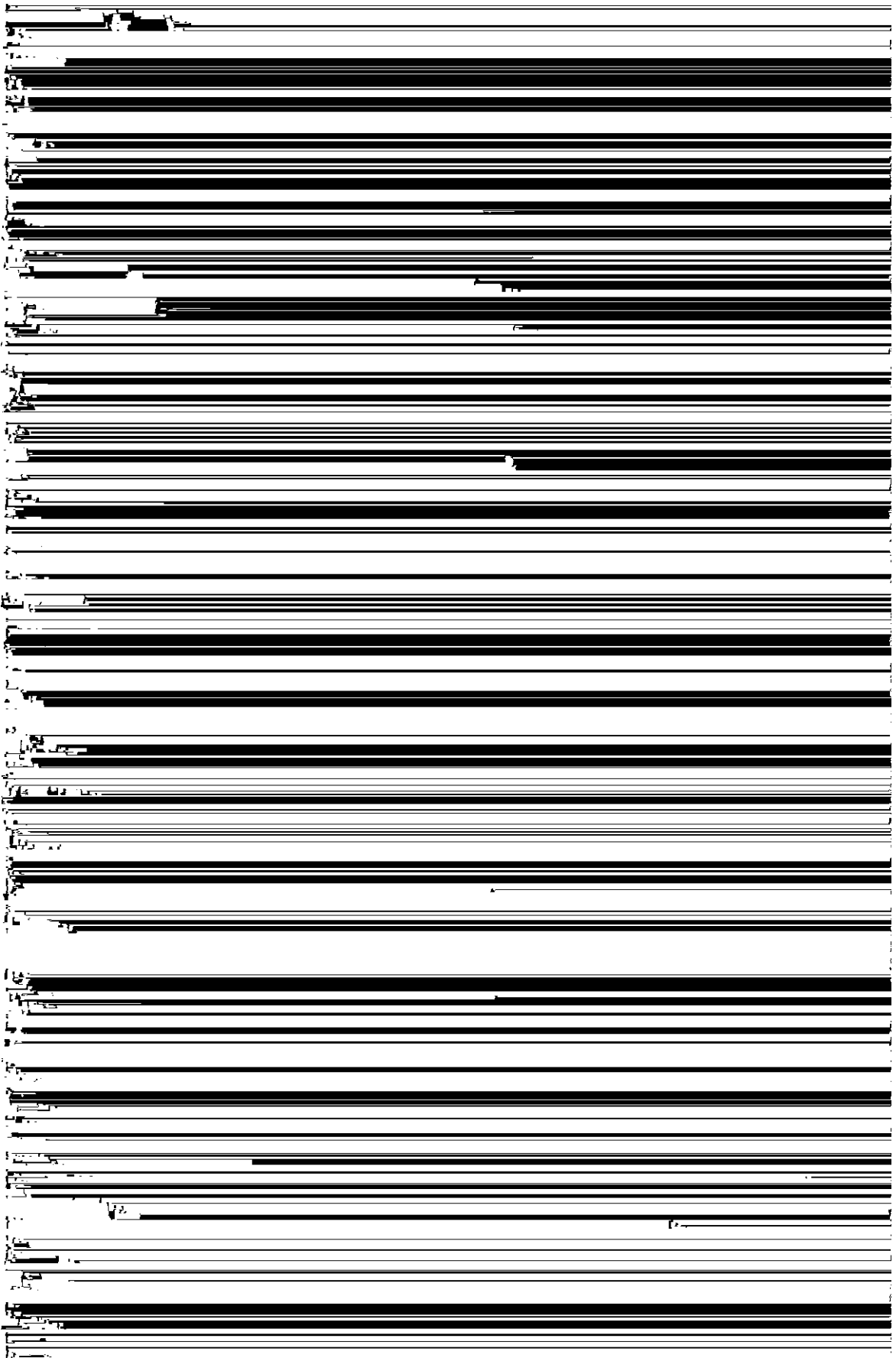
6. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the fifth excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

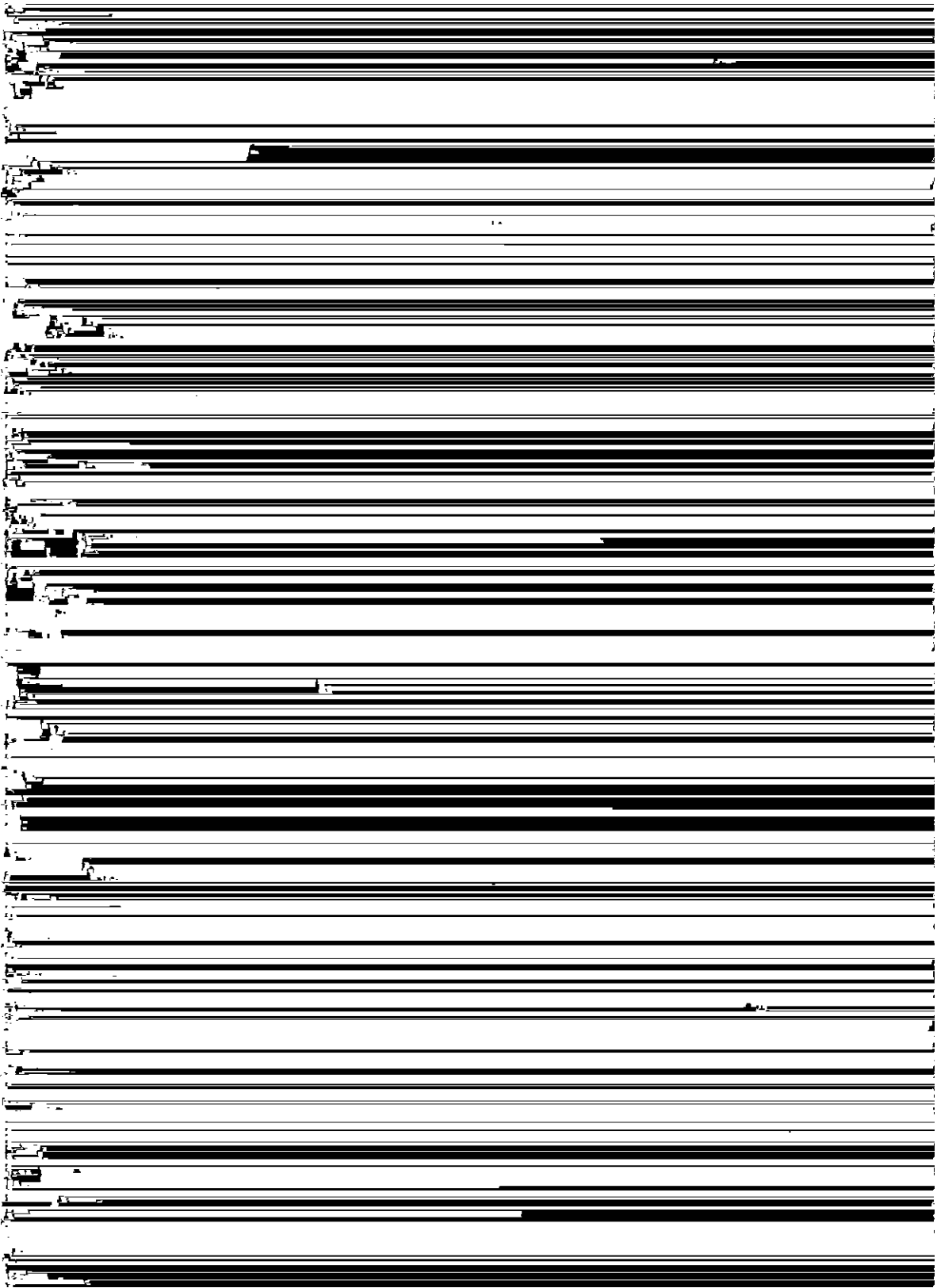
7. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the sixth excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

8. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the seventh excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

9. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the eighth excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.

10. A particle of mass m moves in a one-dimensional potential $V(x) = \frac{1}{2}kx^2$. The particle is in the ninth excited state. Calculate the probability of finding the particle between $x = -a$ and $x = a$.







[REDACTED]

[REDACTED]



