**Problem Set 5 (Due 4/1/2025 before class in stapled A4-sized paper)**

**Late homework will NOT be accepted, unless you have notified the course instructor 3 days BEFORE deadline.**

**Part I (60%)**

**文本, 信件

AI 生成的内容可能不正确。**

**文本

描述已自动生成**

**Part II (40%) Basic problems.**

For problems 1-5. A factory worker pushes a 30.0-kg crate a distance of 4.5 m along a level floor at constant velocity by pushing horizontally on it. The coefficient of kinetic friction between the crate and the floor is 0.25.

1. What magnitude of force must the worker apply?
2. How much work is done on the crate by this force?
3. How much work is done on the crate by friction?
4. How much work is done on the crate by the normal force? By gravity?
5. What is the total work done on the crate?
6. What is the kinetic Energy of a 150 kg object that is moving with a speed of 15 m/s?
7. An object has a kinetic energy of 25 J and a mass of 34 kg, how fast is the object moving?
8. Work done by a force on a moving object is 100J. It was traveling at a speed of 2 m/s. Find the new speed of the object if the mass of the object is 2 kg.

1. A 700-N marine in basic training climbs a 10.0m vertical rope at a constant speed, with a total duration of 8.00 s. What is his power output?
2. How long does it take a 2.5 kW electric motor to do 75, 000 J of work?