Potential Energy Worksheet

Name: _____ Class: _____ Date: _____

A. MCQs

1. The energy possessed by an object due to its position is: a) Kinetic b) Potential c) Heat d) Sound
2. SI unit of potential energy is: a) Watt b) Newton c) Joule d) Pascal
3. Gravitational PE depends on: a) mass only b) height only c) mass and height d) speed
4. A 2 kg object is at a height of 5 m. Its PE is: a) 10 J b) 25 J c) 50 J d) 100 J
5. If the height of an object is doubled, its gravitational PE becomes:

   a) half b) unchanged c) double d) four times

6. Which has the greatest gravitational PE?

   a) 2 kg at 5 m b) 5 kg at 2 m c) 3 kg at 4 m d) 1 kg at 10 m

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B. Fill in the Blanks

7. Potential energy due to height is called _____ potential energy.
8. The SI unit of energy is _____.
9. Gravitational PE is given by PE=_____.
10. If h=0h=0, gravitational PE is _____.
11. Increasing the mass while keeping height constant _____ the PE.
12. A stretched rubber band possesses _____ potential energy.

C. True or False

13. Gravitational potential energy depends on the height of an object. _____
14. A heavier object always has greater PE regardless of its height. _____
15. A book kept on a high shelf has gravitational PE. _____
16. PE can be converted into kinetic energy. _____
17. The unit of PE is Newton. _____
18. At the same height, doubling mass doubles PE. _____

D. Match the Following

Column A	Column B
19. PE	a. mghmgh
20. SI unit	b. Height
21. Gravitational PE depends on	c. Joule
22. Stretched spring	d. Stored energy
23. Formula	e. Potential energy

E. Very Short Answer

24. What is potential energy?

25. Name two factors affecting gravitational PE.

26. What happens to PE when an object is lifted upward?

27. Give one everyday example of gravitational PE.

28. Give one example of elastic potential energy.

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F. Numerical Questions

29. Find the PE of a 5 kg object kept at 4 m.

30. A 10 kg box is lifted to a height of 6 m. Find its PE.

31. An object has a PE of 800 J at a height of 10 m. Find its mass.

32. A 4 kg object has 200 J of PE. Find its height.

33. A 2 kg ball is raised from 3 m to 8 m. Find the increase in PE.

G. Assertion–Reason

Choose: **A** Both true, and R explains A;

B Both true, but R does not explain A;

C A true, R false; **D** A false, R true.

34. **A:** A body at greater height generally has greater gravitational PE.
R: Gravitational PE is proportional to height.

35. **A:** A 10 kg object and a 2 kg object at the same height have equal PE.
R: Gravitational PE is independent of mass.

H. Case-Based Questions

36. Riya lifts a 4 kg schoolbag from the floor to a shelf 2 m high.

a) What type of energy increases?
b) Calculate the increase in PE.
c) What happens to its PE if it is lifted to 4 m?
d) Which quantity remains unchanged: mass or height?

37. A ball is held at a height and then released. As it falls:

a) What happens to its gravitational PE?
b) What happens to its kinetic energy?
c) Name the energy conversion taking place.
d) At the instant before reaching the ground, which form of energy is greatest (ignoring air resistance)?

I. HOTS / Application

38. Two identical balls are placed at heights of 2 m and 8 m. Which has more PE? Explain.

39. A 5 kg object at 6 m and a 10 kg object at 3 m are compared. Do they have the same PE? Show calculation.

40. A student says, **"A stationary object cannot have energy."** Is this statement correct? Explain using potential energy.

41. Why does water stored behind a dam have the ability to do work?

42. A climber carries a 15 kg bag from the ground to a height of 10 m. Calculate the gain in PE and explain where this energy comes from.

J.

43. Object A has mass mm and height hh. Object B has mass 2m2m and height h/2h/2. Compare their gravitational PE.

44. If the mass of an object is doubled and its height is tripled, by what factor does its PE change?

45. A 2 kg object has 100 J of gravitational PE. Another object has the same PE at twice the height. What is its mass?

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