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SET 2 – WORK, ENERGY AND POWER

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1. The work done by a force is equal to the change in:
(a) momentum
(b) kinetic energy
(c) potential energy
(d) acceleration

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2. If a man pushes a wall and the wall does not move, work done by the man is:
(a) positive
(b) negative
(c) zero
(d) infinite

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3. The work-energy theorem is based on:
(a) First law of motion
(b) Second law of motion
(c) Third law of motion
(d) Newton's law of gravitation

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4. The dot product of two vectors is a:
(a) scalar
(b) vector
(c) tensor
(d) matrix

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5. Work done by gravity on a body moving along a circular path is:
(a) positive
(b) negative
(c) zero
(d) constant

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6. The slope of a work-time graph represents:
(a) power
(b) velocity

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(c) force
(d) energy

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7. If F = 10 N and displacement = 5 m in the direction of force, then work done = ?
(a) 15 J
(b) 5 J
(c) 50 J
(d) 0

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8. Work done by a man lifting a box of mass 5 kg through 2 m ($g = 10\ m/s^2$) is:
(a) 50 J
(b) 100 J
(c) 10 J
(d) 0

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9. The unit of power in CGS system is:
(a) erg/s
(b) joule/s
(c) watt
(d) dyne/cm

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10. 1 kilowatt-hour is equal to:
(a) 36×10^4 J
(b) 3.6×10^5 J
(c) 3.6×10^6 J
(d) 3.6×10^7 J

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11. The kinetic energy of a body depends on:
(a) mass only
(b) velocity only
(c) both mass and velocity
(d) acceleration only

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12. Potential energy depends on:
(a) position
(b) motion

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(c) direction
(d) density

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13. The energy of a body due to its position above the ground is:
(a) kinetic energy
(b) potential energy
(c) elastic energy
(d) electrical energy

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14. Power is the rate of change of:
(a) work
(b) acceleration
(c) displacement
(d) force

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15. The work done by friction on a moving body is generally:
(a) positive
(b) negative
(c) zero
(d) undefined

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16. The total energy of a freely falling body remains:
(a) constant
(b) increasing
(c) decreasing
(d) zero

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17. The unit of force is:
(a) joule
(b) newton
(c) watt
(d) erg

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18. Which of the following is a conservative force?
(a) gravitational
(b) friction

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(c) air resistance
(d) viscous

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19. Work is said to be positive when:
(a) θ = 180°
(b) θ = 90°
(c) θ = 0°
(d) θ = 60°

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20. A 100 W bulb glows for 10 hours. Energy consumed = ?
(a) 1000 J
(b) 1 kWh
(c) 10 kWh
(d) 0.1 kWh

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21. The power of a machine is 500 W. It does 1000 J of work in:
(a) 2 s
(b) 5 s
(c) 0.5 s
(d) 1 s

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22. The unit of energy commonly used in atomic physics is:
(a) joule
(b) erg
(c) electron volt
(d) calorie

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23. The work done by the net force on a particle is equal to the change in its:
(a) potential energy
(b) acceleration
(c) kinetic energy
(d) displacement

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24. Which of the following pairs has same dimensions?
(a) work and torque
(b) work and force

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(c) torque and acceleration
(d) power and energy

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25. 1 eV = ? joules
(a) 1.6×10^{-19} J
(b) 3.6×10^{-6} J
(c) 1.6×10^{6} J
(d) 3.6×10^{7} J

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26. A block of 2 kg slides 5 m down a smooth inclined plane. Work done by gravity = ? (g = 10 m/s², θ = 30°)
(a) 50 J
(b) 100 J
(c) 25 J
(d) 75 J

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27. The power developed by a force is given by:
(a) P = F/a
(b) P = F.v
(c) P = F × t
(d) P = m/F

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28. The work-energy theorem does not hold when:
(a) frictional forces are present
(b) external work is done
(c) pseudo forces are neglected
(d) forces are conservative

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29. When a spring is stretched by x, the work done by the spring is:
(a) +½ kx²
(b) –½ kx²
(c) kx²
(d) zero

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30. In which case is the work done maximum?
(a) θ = 0°
(b) θ = 45°

(c) $\theta = 90°$
(d) $\theta = 180°$

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31. The kinetic energy of a car of mass 1000 kg moving at 72 km/h is:
(a) 2×10^5 J
(b) 1×10^5 J
(c) 5×10^4 J
(d) 3×10^5 J

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32. A 2 kg body moving with a speed of 3 m/s has kinetic energy:
(a) 3 J
(b) 6 J
(c) 9 J
(d) 12 J

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33. Work done by a constant force F on a body moving distance s at angle θ is:
(a) $Fs \sin \theta$
(b) $Fs \cos \theta$
(c) F/s
(d) $F \times s$

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34. The power of an engine doing 600 J work in 10 s is:
(a) 60 W
(b) 6000 W
(c) 6 W
(d) 600 W

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35. Which of the following quantities has the unit J/s?
(a) energy
(b) work
(c) power
(d) impulse

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36. The work done by the gravitational force on a satellite moving around Earth is:
(a) positive
(b) negative

(c) zero
(d) infinite

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37. For a conservative system, total mechanical energy is:
(a) zero
(b) increasing
(c) decreasing
(d) constant

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38. The potential energy of a spring varies with:
(a) x
(b) x^2
(c) 1/x
(d) $\sqrt{x}$

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39. Work done by a man carrying a suitcase at constant height and speed is:
(a) zero
(b) positive
(c) negative
(d) maximum

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40. The dot product of two unit vectors inclined at 60° is:
(a) 1
(b) 0
(c) ½
(d) $\sqrt{3}/2$

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41. If work done on a system is positive, then its energy:
(a) increases
(b) decreases
(c) remains constant
(d) becomes negative

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42. Which physical quantity is the rate of change of momentum?
(a) force
(b) energy

(c) work
(d) pressure

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43. Which law ensures conservation of energy?
(a) Newton's 2nd law
(b) Work-energy theorem
(c) Hooke's law
(d) Coulomb's law

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44. In a simple pendulum, at the extreme position:
(a) kinetic energy is maximum
(b) potential energy is maximum
(c) both are zero
(d) both are equal

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45. The angle between force and displacement for which work is negative:
(a) 0°
(b) 45°
(c) 90°
(d) 180°

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46. A conservative force is one whose work done in a closed path is:
(a) maximum
(b) minimum
(c) zero
(d) constant

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47. Energy can neither be created nor destroyed — this statement is of:
(a) law of conservation of mass
(b) law of conservation of energy
(c) work-energy theorem
(d) law of motion

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48. The quantity having dimensions $[ML^2T^{-3}]$ is:
(a) work
(b) power

(c) energy
(d) impulse

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49. When a spring is stretched, the work done against the spring is stored as:
(a) thermal energy
(b) potential energy
(c) kinetic energy
(d) light energy

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50. The relation between work (W), force (F), and displacement (s) is:
(a) W = F × s
(b) W = F/s
(c) W = s/F
(d) W = F + s

✅ ANSWERS – SET 2

1 (b)	2 (c)	3 (b)	4 (a)	5 (c)	6 (a)	7 (c)	8 (b)	9 (a)	10 (c)
11 (c)	12 (a)	13 (b)	14 (a)	15 (b)	16 (a)	17 (b)	18 (a)	19 (c)	20 (b)
21 (a)	22 (c)	23 (c)	24 (a)	25 (a)	26 (a)	27 (b)	28 (c)	29 (b)	30 (a)
31 (a)	32 (b)	33 (b)	34 (a)	35 (c)	36 (c)	37 (d)	38 (b)	39 (a)	40 (c)
41 (a)	42 (a)	43 (b)	44 (b)	45 (d)	46 (c)	47 (b)	48 (b)	49 (b)	50 (a)