

ENERGY AND PHYSICS — UNIT TEST

BC Science 10 | Revised ELL Version | Student Copy

Name: _____ Date: _____ Class: _____

Score: _____ / 100

Choose one answer unless the question asks for matching, classification, or a short response. Show your thinking for energy questions.

Part A — Multiple Choice (35 marks)

1. In photosynthesis, plants take in energy from:

- A. sunlight
- B. sound
- C. friction
- D. gravity

2. Cellular respiration helps living things:

- A. store sunlight directly
- B. release usable energy from sugar
- C. stop all chemical reactions
- D. make nuclear fuel

3. In an energy reaction, the system is:

- A. everything in the universe
- B. only the air
- C. the part being studied
- D. always a living thing

4. Energy that leaves a system enters the:

- A. surroundings
- B. nucleus
- C. vacuum only
- D. fuel cell

5. An exothermic reaction:

- A. absorbs heat from surroundings
- B. releases heat to surroundings
- C. destroys energy
- D. cannot change temperature

6. Which is an example of an exothermic reaction?

- A. melting ice
- B. evaporating water
- C. burning wood
- D. photosynthesis

7. An endothermic process:
- A. takes in energy from surroundings
 - B. always gives out heat
 - C. makes energy from nothing
 - D. never changes energy
8. Why can a perpetual motion machine not work?
- A. All motion is circular
 - B. It must lose or transfer energy and needs an input
 - C. Gravity does not exist
 - D. Objects have no kinetic energy
9. Kinetic energy is the energy of:
- A. height
 - B. movement
 - C. stored fuel only
 - D. a nucleus only
10. Gravitational potential energy increases when an object:
- A. moves lower
 - B. stops existing
 - C. is raised higher
 - D. gets colder
11. When a sled slides downhill, some energy changes into heat because of:
- A. photosynthesis
 - B. friction
 - C. fusion
 - D. evaporation
12. If speed doubles while mass stays the same, kinetic energy becomes:
- A. twice as large
 - B. four times as large
 - C. half as large
 - D. unchanged
13. Which pair of factors affects gravitational potential energy?
- A. mass and height
 - B. colour and shape
 - C. speed and sound
 - D. temperature and colour
14. Ignoring friction, a falling rock changes:
- A. kinetic energy into chemical energy
 - B. potential energy into kinetic energy
 - C. heat into nuclear energy
 - D. sound into solar energy

15. A hydrogen fuel cell mainly converts chemical energy into:
- A. electrical energy
 - B. gravitational energy
 - C. sound energy
 - D. light from the Sun
16. In the worksheet, hydrogen and oxygen in a fuel cell form:
- A. carbon dioxide
 - B. coal
 - C. water
 - D. uranium
17. Radioactivity happens when:
- A. unstable nuclei release particles or energy
 - B. water freezes
 - C. light reflects
 - D. all atoms disappear
18. Gamma radiation is mainly:
- A. a stream of water
 - B. energy released from a nucleus
 - C. two joined nuclei
 - D. a moving air current
19. Nuclear fission means:
- A. small nuclei join
 - B. a large nucleus splits
 - C. water evaporates
 - D. a fuel cell operates
20. Nuclear fusion means:
- A. small nuclei join
 - B. a large nucleus splits
 - C. heat moves by touch
 - D. coal burns
21. Which process powers the Sun?
- A. conduction
 - B. nuclear fusion
 - C. chemical combustion
 - D. friction
22. A nuclear power plant uses heat from fission to produce:
- A. steam that turns a turbine
 - B. wind inside the reactor
 - C. sunlight
 - D. new fossil fuels

23. Earth receives most of its external energy from:
- A. the Moon
 - B. the Sun
 - C. deep ocean rocks
 - D. human machines
24. Sunlight reaches Earth mainly through:
- A. conduction
 - B. convection
 - C. radiation
 - D. friction
25. Earth's energy balance compares:
- A. incoming and outgoing energy
 - B. day and night lengths only
 - C. land and water area
 - D. mass and speed
26. The Sun drives the water cycle by providing energy for:
- A. evaporation
 - B. nuclear fission
 - C. rock formation only
 - D. magnetism
27. During condensation, water vapour:
- A. turns into liquid droplets
 - B. becomes hydrogen fuel
 - C. stops having mass
 - D. changes into rock
28. Heat transfer through direct contact is:
- A. radiation
 - B. conduction
 - C. convection
 - D. fusion
29. Heat transfer through moving liquids or gases is:
- A. convection
 - B. fission
 - C. conduction only
 - D. potential energy
30. Which example shows radiation?
- A. a spoon warming in hot soup
 - B. warm water rising in a pot
 - C. sunlight warming your face
 - D. your hand touching a warm cup

31. Which example shows convection?
- A. sunlight travelling through space
 - B. warm water rising as soup boils
 - C. a metal handle heating by touch
 - D. a sled stopping
32. Which historical energy source powered many steam trains?
- A. coal
 - B. solar panels
 - C. hydrogen fuel cells
 - D. uranium fusion
33. A concern related to nuclear energy is:
- A. nuclear waste storage
 - B. the loss of gravity
 - C. no need for community input
 - D. lack of energy release
34. When planning nuclear waste storage on or near Indigenous lands, decision makers should:
- A. ignore local communities
 - B. consult and listen to affected Indigenous communities
 - C. consider only electricity prices
 - D. assume every community agrees
35. Which statement follows conservation of energy?
- A. Energy can be created freely
 - B. Energy disappears after friction
 - C. Energy transfers or changes form but is not destroyed
 - D. All energy remains useful forever

Part B — Matching (15 marks)

Match each term with its meaning. Write the correct letter. Each letter is used once.

- | | |
|--|---|
| 36. system _____ | A. Energy of movement |
| 37. surroundings _____ | B. Heat transfer by touching |
| 38. exothermic _____ | C. Small nuclei joining together |
| 39. endothermic _____ | D. Part of the world being studied |
| 40. kinetic energy _____ | E. Liquid water changing to water vapour |
| 41. gravitational potential energy _____ | F. Heat transfer by moving fluids |
| 42. friction _____ | G. Energy stored because of height |
| 43. fuel cell _____ | H. A process that takes in heat |
| 44. radioactivity _____ | I. A device converting fuel energy into electricity |
| 45. fission _____ | J. Everything outside the system |

46. fusion _____

47. radiation _____

48. conduction _____

49. convection _____

50. evaporation _____

K. Heat transfer that can travel through space

L. An unstable nucleus releasing particles or energy

M. A force that can change movement energy into heat

N. A large nucleus splitting into smaller nuclei

O. A process that gives out heat

Part C — Fill in the Blanks (10 marks)

Word bank: sunlight | heat | surroundings | speed | height | water | fusion | fission | evaporation | conduction

51. Plants use energy from _____ for photosynthesis.

52. An exothermic reaction releases _____.

53. Energy leaving a system goes to its _____.

54. Kinetic energy depends on mass and _____.

55. Gravitational potential energy increases with _____.

56. Hydrogen and oxygen in a fuel cell form _____.

57. The Sun releases energy through nuclear _____.

58. Splitting a large nucleus is called nuclear _____.

59. The Sun provides energy for water _____.

60. Heat moving through direct contact is _____.

Part D — Classification and Application (25 marks)

61. Classify each example as exothermic or endothermic: (a) burning wood; (b) melting ice; (c) a reaction that warms its surroundings. (5 marks)

62. A sled starts high on a hill and moves downhill. Identify (a) its main energy type at the top; (b) its main energy type while moving; (c) one reason it slows down. (5 marks)

63. Classify each example as radiation, conduction, or convection: (a) sunlight warms skin; (b) a metal spoon warms in soup; (c) warm water rises in a pot. (5 marks)

64. Put these nuclear-power steps in the correct order: steam turns a turbine; fission releases heat; electricity is produced; water turns into steam. (5 marks)

65. Complete the water-cycle sequence using these words: condensation, collection, evaporation, precipitation. Start with the Sun warming surface water. (5 marks)

Part E — Short Response (15 marks)

Answer each in 1–2 short sentences. Each question is worth 3 marks.

66. Why is a perpetual motion machine impossible?

67. Explain how friction affects a sled's energy as it slides.

68. Explain one difference between nuclear fission and nuclear fusion.

69. Describe how solar energy helps move water through the water cycle.

70. Give one benefit of an energy technology and one concern that people or communities should consider.

ENERGY AND PHYSICS — ANSWER KEY

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Part A — Multiple Choice

1. A 2. B 3. C 4. A 5. B 6. C 7. A
8. B 9. B 10. C 11. B 12. B 13. A 14. B
15. A 16. C 17. A 18. B 19. B 20. A 21. B
22. A 23. B 24. C 25. A 26. A 27. A 28. B
29. A 30. C 31. B 32. A 33. A 34. B 35. C

Part B — Matching

36. D 37. J 38. O 39. H 40. A
41. G 42. M 43. I 44. L 45. N
46. C 47. K 48. B 49. F 50. E

Part C — Fill in the Blanks

51. sunlight
52. heat
53. surroundings
54. speed
55. height
56. water
57. fusion
58. fission
59. evaporation
60. conduction

Part D — Sample Answers / Marking Guide

61. (a) exothermic; (b) endothermic; (c) exothermic. Award marks for correct classification and explanation.
62. (a) gravitational potential energy; (b) kinetic energy; (c) friction transfers some energy to heat.
63. (a) radiation; (b) conduction; (c) convection.
64. Fission releases heat → water turns into steam → steam turns a turbine → electricity is produced.
65. Evaporation → condensation → precipitation → collection. The Sun provides energy for evaporation.

Part E — Sample Answers

66. Energy cannot be created. Real machines transfer energy to surroundings, including through friction, so continued motion needs an energy input.
67. Friction transfers some of the sled's movement energy into heat, so it slows down.
68. Fission splits a large nucleus; fusion joins small nuclei. Both release energy.
69. Solar energy warms water and causes evaporation. Water later condenses and falls as precipitation.
70. Example: Fuel cells provide electricity and produce water at the point of use; making and supplying hydrogen still requires resources. Accept other well-supported examples from the unit.

Mark Distribution

Part A: 35 marks

Part B: 15 marks

Part C: 10 marks

Part D: 25 marks (5 each)

Part E: 15 marks (3 each)

TOTAL: 100 marks

Topic coverage: chemical reactions; systems; energy transfer; motion; fuel cells; radioactivity; fission and fusion; solar energy; water cycle; heat transfer; energy choices.