Energy—How Things Work

Standard difficulty · 20 questions · 40 marks · Time: 54 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. Energy is what makes things:
   (a) only coloured
   (b) stay still forever
   (c) only heavy
   (d) move, light up, make sound or get hot or cold

2. A electric bell changes electricity mainly into:
   (a) cooling **(b)** light **(c)** sound **(d)** heat

3. Which of these is a RENEWABLE source of energy?
   (a) diesel **(b)** coal
   (c) sunlight **(d)** cooking gas (LPG)

4. Which of these is NON-RENEWABLE and will run out one day?
   (a) diesel **(b)** flowing water **(c)** wind **(d)** biogas

5. What energy makes a car work?
   (a) petrol or diesel **(b)** cooking gas
   (c) wind **(d)** flowing water

6. A wet school shirt dries in 2 hours in the sun but takes 8 hours in the shade. How many hours sooner does it dry in the sun?
   (a) 10 hours **(b)** 8 hours **(c)** 2 hours **(d)** 6 hours

7. By switching off lights and fans when leaving rooms, a family saves 3 units of electricity a day. How many units do they save in 15 days?
   (a) 60 units **(b)** 18 units **(c)** 45 units **(d)** 42 units

8. One bus carries 180 people. If they each went in cars instead, with 2 people in each car, how many cars would be needed?
   (a) 90 cars **(b)** 178 cars **(c)** 180 cars **(d)** 92 cars

Section B — Short answer — 8 × 2 = 16 marks

9. What is energy?

10. What does each change electricity mainly into (movement, heat, light, sound or cooling)? (a) tube light (b) washing machine

11. Write "renewable" or "non-renewable": (a) coal (b) biogas

12. What energy makes each work? (a) a gas stove (b) a sailing boat

13. Two same rubber bands are stretched over a tin: one loose and one tight. Which one makes the LOWER sound when plucked?

14. A solar panel on a roof makes 6 units of electricity a day. Each unit costs ₹5. How much money does it save in a 30-day month?

15. Arjun cycles 7 km to school and 7 km back, 6 days a week. How many kilometres is that in a week, using only the energy from food?

16. A classroom has 7 fans. If each fan is left running 3 extra hours a day by mistake, how many fan-hours are wasted in 5 school days?

Section C — Word problems — 4 × 4 = 16 marks

17. Imagine a day without electricity. Describe four ways your day would change.

18. A family's solar panels make 10 units of electricity a day. Electricity costs ₹6 a unit. (a) How much do they save in a year (365 days)? (b) The panels cost ₹60,000. About how many full years until the savings pay for them? (c) Give one more reason to use solar energy.

19. Every morning 52 cars, each carrying 3 people, drive to the same office area. (a) How many people is that? (b) How many buses of 40 seats would carry them all? (c) Why is going by bus better for the air?

20. For a refrigerator and a washing machine: what energy goes in, what comes out, and one way to save energy while using it?

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Answer key

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Q	Answer	Working
1	**(d) move, light up, make sound or get hot or cold**	—
2	**(c) sound**	—
3	**(c) sunlight**	—
4	**(a) diesel**	—
5	**(a) petrol or diesel**	—
6	**(d) 6 hours**	8 − 2 = 6
7	**(c) 45 units**	3 × 15 = 45
8	**(a) 90 cars**	180 ÷ 2 = 90
9	**The ability to make things move, light up, make sound, or become hot or cold.**	—
10	**(a) light (b) movement**	—
11	**(a) non-renewable (b) renewable**	—
12	**(a) cooking gas (b) wind**	—
13	**the loose one**	—
14	**₹900**	6 × 30 = 180 units; × ₹5
15	**84 km**	7 × 2 × 6 = 84
16	**105 fan-hours**	7 × 3 × 5 = 105
17	**No fans or lights, so it would be hot and dark at night; no television or phone charging; the fridge would stop and food would spoil; water pumps would stop; we would study by sunlight or a lamp.**	—
18	**(a) ₹21,900 (b) 3 years (c) It is clean and renewable: no smoke, and it will not run out.**	10 × 6 × 365 = 21900; 60,000 ÷ 21900 → round up
19	**(a) 156 people (b) 4 buses (c) Fewer vehicles burn less fuel, so there is less smoke and the fuel lasts longer.**	52 × 3 = 156; 156 ÷ 40 → round up
20	**(a) cooling (b) movement**	—