

STUDYNEST | CLASS 11 PHYSICS MARKING SCHEME AND MODEL ANSWERS

Chapter 11: Thermodynamics

Maximum Marks: 40 | Suggested time: 60 minutes

Use after attempting the paper. Accept equivalent correct methods.

Suggested mark allocation:

1 mark: Correct fact, formula, unit or direction.

2 marks: Principle/formula (1); explanation, working or result (1).

3 marks: Relation (1); working/reasoning (1); final result and unit (1).

4 marks: Principle (1); setup/equation (1); working (1); result/interpretation (1).

Mark splits are a guide; award partial credit for valid steps.

Q1 - 1 mark

Thermal equilibrium is transitive.

Q2 - 1 mark

Microscopic energy of molecules and their interactions.

Q3 - 1 mark

$Q = \Delta U + W$.

Q4 - 1 mark

$Q = 0$.

Q5 - 1 mark

Temperature constant.

Q6 - 1 mark

No.

Q7 - 1 mark

$pV = nRT$.

Q8 - 1 mark

$1 - T_c/T_h$.

Q9 - 2 marks

Zero boundary work.

Q10 - 2 marks

500 J.

Q11 - 2 marks

50%.

Q12 - 2 marks

Zero.

Q13 - 2 marks

100 J.

Q14 - 2 marks

Isothermal: T constant; adiabatic: $Q = 0$.

Q15 - 3 marks

600 J.

Q16 - 3 marks

40%.

Q17 - 3 marks

$W = p\Delta V = 2000$ J.

Q18 - 3 marks

Second law requires rejected heat or other entropy increase.

Q19 - 4 marks

Reversible: ideal quasi-static frictionless; irreversible: friction or finite-temperature heat flow.

Q20 - 4 marks

Carnot limit 50%; actual efficiency 33.3%; $Q_{out} = 1000$ J.