1. The first law of thermodynamics is a restatement of:

A) Law of conservation of energy
B) Law of conservation of mass
C) Newton's law
D) Hooke's law

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2. In the first law of thermodynamics, the term dQ=dU+dWdQ = dU + dWdQ=dU+dW represents:

A) Heat absorbed = Change in pressure + Work done
B) Heat added = Internal energy change + Work done
C) Heat added = Temperature change + Pressure
D) Work done = Internal energy × Pressure

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3. The SI unit of heat is:

A) Calorie
B) Joule
C) Watt
D) Kelvin

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4. Which thermodynamic process occurs at constant pressure?

A) Isothermal
B) Isobaric
C) Isochoric
D) Adiabatic

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5. In an adiabatic process:

A) Temperature remains constant
B) Pressure remains constant
C) No heat is exchanged
D) Volume remains constant

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6. Which of the following is a state function?

A) Heat
B) Work
C) Internal energy
D) Path length

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7. Work done in a cyclic process is:

A) Zero
B) Equal to heat absorbed
C) Equal to change in internal energy
D) Area enclosed in the PV diagram

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8. The internal energy of an ideal gas depends only on:

A) Volume
B) Pressure
C) Temperature
D) Both volume and pressure

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9. In an isochoric process, the work done is:

A) Minimum
B) Maximum
C) Zero
D) Infinite

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10. The second law of thermodynamics introduces the concept of:

A) Work
B) Heat
C) Internal energy
D) Entropy

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11. Which of the following statements is correct?

A) Heat flows from cold to hot naturally
B) Work can be completely converted into heat
C) Heat cannot be converted into work
D) Entropy of an isolated system always decreases

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12. The efficiency of a Carnot engine depends on:

A) Working substance
B) Temperature of source and sink
C) Pressure of gas
D) Volume of gas

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13. Efficiency η\etaη of a Carnot engine is:

A) 1−T1T21 - \frac{T_1}{T_2}1−T2T1
B) 1+T1T21 + \frac{T_1}{T_2}1+T2T1

C) T2−T1T2\frac{T_2 - T_1}{T_2}T2T2−T1
D) T1−T2T1\frac{T_1 - T_2}{T_1}T1T1−T2

Where T1=T_1 =T1= temperature of sink, T2=T_2 =T2= temperature of source

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14. In a thermodynamic process, no heat is exchanged. It is called:

A) Isothermal
B) Adiabatic
C) Isochoric
D) Isobaric

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15. When a gas expands adiabatically, its:

A) Temperature increases
B) Temperature remains same
C) Temperature decreases
D) Pressure remains same

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16. Heat engine converts:

A) Work into energy
B) Heat into work
C) Pressure into energy
D) Temperature into energy

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17. The efficiency of real heat engines is always:

A) Equal to Carnot engine
B) More than Carnot engine
C) Less than Carnot engine
D) 100%

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18. Zeroth law of thermodynamics defines:

A) Internal energy
B) Entropy
C) Heat
D) Temperature

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19. If no heat is supplied to a system and it still does work, the process must be:

A) Isothermal
B) Isochoric

C) Isobaric
D) Adiabatic

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20. The change in internal energy in an isothermal process is:

A) Maximum
B) Minimum
C) Zero
D) Infinite

✅ **Answer Key**

1. A
2. B
3. B
4. B
5. C
6. C
7. D
8. C
9. C
10. D
11. B
12. B
13. A
14. B
15. C
16. B
17. C
18. D
19. D
20. C