University of Mumbai Examination 2020

Program: Automobile Engineering
Curriculum Scheme: Rev 2012 & Rev2016
Examination: Second Year Semester: III
Course Code: AEC302 and Course Name: Thermodynamics
Time: 1 hour Max. Marks: 50

1. In ..... approach, a certain quantity of matter is considered, without a concern on the events occurring at the molecular level.

   Mark only one oval.

   - ◯ macroscopic
   - ◯ microscopic
   - ◯ Menuscropic
   - ◯ random

2. A process in which all states of the system passes through are equilibrium states is called as

   Mark only one oval.

   - ◯ Isobaric Process
   - ◯ Quasis Staic Process
   - ◯ Polytropic Process
   - ◯ Adiabatic Process

3. Heat transfer is zero in

   Mark only one oval.

   - ◯ Polytropic Process
   - ◯ Adiabatic Process
   - ◯ Constant pressure process
   - ◯ Constant volume process

4. The enthalpy of an ideal gas is independent of its ..... , and depends only on its temperature

Mark only one oval.

- Pressure
- Volume
- Gas constant
- index

5. Energy is a ..... of a system.

Mark only one oval.

- State
- Property
- Process
- None of the above

6. ..... is a property of a system which determines the degree of hotness or coldness.

Mark only one oval.

- Pressure
- Volume
- Temperature
- Viscosity

7. In constant volume process the pressure at the initial state was 1 bar and temp was 300 k. At the end state the pressure was rise to 10 bar and temp. was 600K. Find the work done in KJ?

Mark only one oval.

- 30
- 300
- 250
- 0

8. Air is compressed poly-tropically till it's temp becomes 500 K. the initial temp of air is 300K. find the work done (KJ/Kg)? index of the process is 1.3

Mark only one oval.

- 191.33
- -191.33
- 0
- 250

9. Untitled Question

Mark only one oval.

- Option 1

10. What is the relation between efficiencies of Rankine cycle and Carnot cycle for the same pressure ratio?

Mark only one oval.

- $(\eta Rankine) = (\eta Carnot)$
- $(\eta Rankine) > (\eta Carnot)$
- $(\eta Rankine) < (\eta Carnot)$
- $(\eta Rankine) = (\eta Carnot) = 0$

11. For the dry steam, dryness fraction m is =

Mark only one oval.

- 0
- 1
- 0 > m
- 0 < m < 1

12. The ..... point of a substance is the temperature and pressure at which the three phases (gas, liquid, and solid) of that substance coexist in thermodynamic equilibrium.

Mark only one oval.

- first
- second
- triple
- last

13. The ..... temperature is the temperature for a corresponding saturation pressure at which a liquid boils into its vapor phase.

Mark only one oval.

- saturation
- fusion
- vanishing
- cold

14. The cycle which consists of two reversible isotherms and two reversible adiabatic is called as

Mark only one oval.

- Rankine cycle
- Carnot cycle
- Stirling cycle
- Ericsson cycle

15. Find the efficiency of otto cycle having compression ratio 8.

Mark only one oval.

- 56.5%
- 66.8%
- 48%
- 25%

16. What is the relation between compression ratio and the efficiency of the Otto cycle?

Mark only one oval.

- efficiency decreases with increase in compression ratio
- efficiency increases with increase in compression ratio
- efficiency does not affected by change in compression ratio
- efficiency may increase or decrease by change in compression ratio

17. How is the heat added in the Dual cycle?

Mark only one oval.

- reversibly partially at constant volume and partially at constant pressure
- irreversibly at constant pressure
- reversibly at constant pressure
- irreversibly at constant volume

18. For the same maximum pressure and temperature, what is the relation among the efficiencies of the Otto cycle, the Diesel cycle and the Dual cycle?

Mark only one oval.

- ηDual > ηDiesel > ηOtto
- ηDiesel > ηDual > ηOtto
- ηDiesel > ηOtto > ηDual
- ηOtto > ηDiesel > ηDual

19. The coefficient performance of a refrigerator is 5. Calculate the temperature of the surrounding if the temperature inside the freezer is -20 degree C

Mark only one oval.

- 11 degreeC
- 41 degreeC
- 21 degreeC
- 31 degreeC

20. The process will terminate when the pressure and temperature of the system and surrounding are equal. This state is referred as

Mark only one oval.

- live state
- no state.
- open state.
- dead state

21. ..... function is defined as the difference between the internal energy and the product of temperature and entropy.

Mark only one oval.

- Helmholtz
- GIBB'S
- Kelvin
- Joule's Thompson

22. ..... is expressed as the ratio of useful work Wu to the maximum useful work (Wu)max

Mark only one oval.

- Irreversibility
- Effectiveness
- Availability
- UE

23. A cyclic heat engine operates between a source temperature of 227 C and a sink temperature of 27 C. What will be the maximum efficiency of the heat engine?

Mark only one oval.

- 100%
- 80%
- 40%
- 60%

24. Carnot cycle is

Mark only one oval.

- reversible cycle
- an irreversible cycle
- practical cycle
- Dual cycle

25. COP of a heat pump is

Mark only one oval.

- always less than infinity (COP < ∞)
- always less that 1 (COP < 1)
- always equals to 1 (COP = 1)
- always equals to infinity (COP = ∞)

26. Which among the following is an example of a sink?

Mark only one oval.

- Furnace where fuel is continuously burning
- Sea
- Flywheel in running condition
- Compressed spring