Unit II– Introduction to Thermal Engineering

1. Zeroth law of thermodynamics forms the basis of measurement of the following:
   a. Pressure
   b. Temperature
   c. Work
   d. Heat Exchanger

2. An isolated system is the one which
   a. Allows transfer of energy and mass across its boundaries
   b. Allows transfer mass only across its boundaries
   c. Allows transfer of energy across its boundaries only
   d. Does not allow neither transfer of energy not mass across its boundary.

3. Prime mover is a device which converts natural energy into
   a. True
   b. False

4. A refrigerator and a heat pump operate between the same temperature limits COP of heat pump is 4.The COP of refrigerator will be :
   a. 4
   b. 5
   c. 3
   d. None of the above

5. Which one is not fire tube boiler
   a. Lancashire
   b. Cochron
   c. Babcok-Wilcox
   d. None of the above

6. The suction compression expansion and exhaust strokes of 4 strokes engine are completed in x number of revolutions of crankshaft where the value of x is
   a. 1 b. 2 c. 3 d. 4

7. An internal combustion engine is one in which:
   a. Combustion of fuel takes place inside the cylinder
   b. Chemical energy is converted into mechanical energy
   c. A part of chemical energy released during combustion has to be released to atmosphere
   d. All the above

8. In four stroke petrol engine during the suction stroke,
   a. Only air is sucked
   b. Mixture of fuel and air is sucked
   c. Only fuel is sucked
   d. None of the above

9. In open system:
   a. Mass content of the system remains same.
   b. Transfer of mass and/or energy takes place
   c. There is only mass transfer even through there may not be any energy transfer.
   d. There is only energy transfer.

10. Fire tube boilers are not suitable for large power plants.
    a. True
    b. False

11. Convective thermal resistance is given as ------
    a. A/h
    b. h/A
    c. h.A
    d. 1/hA

12. Thermal resistance to heat flow by conduction is
    a. k/Ax
    b. kx/A
    c. x/kA

d. None of the above

13. Units of thermal conductivity are----.
    a. W/mK
    b. kW/m^2K
    c. Wm/K
    d. None of the above

14. Petrol Engine is
    a. Compression ignition engine
    b. Spark Ignition engine
    c. Mixed ignition engine
    d. All of the above

15. Which of the following is an extensive property?
    a. Volume
    b. Pressure
    c. Viscosity
    d. All of the above

16. According to Kelvin-Planck statement, it is impossible to construct a device operating on a cycle which transfers heat from ____

    a. low pressure heat reservoir to high pressure reservoir
    b. low temperature heat reservoir to high temperature reservoir
    c. high pressure heat reservoir to low pressure reservoir
    d. high temperature heat reservoir to low temperature reservoir

17. Which device maintains a body at a temperature lower than the temperature of the surroundings?
    a. PMM1
    b. PMM2
    c. refrigerator
    d. heat pump

18. What does a refrigerant do?
    a. absorbs the heat leakage into body from surroundings
    b. evaporates in the evaporator
    c. absorbs latent heat of vaporization form the body which is cooled
    d. all of the mentioned

19. Coefficient of performance(COP) is defined as
    a. heat leakage/work input
    b. work input/heat leakage
    c. latent heat of condensation/work input
    d. work input/latent heat of condensation

20. Which device maintains a body at a temperature higher than the temperature of the surroundings?
    a. PMM1
    b. PMM2
    c. refrigerator
    d. heat pump

21. In a heat pump, there is heat leakage from the body to the surroundings.
    a. true
    b. false

22. What is the relation between COP of heat pump and refrigerator?
    a. COP of pump=COP of refrigerator – 1
    b. COP of pump=COP of refrigerator + 1
    c. COP of pump=COP of refrigerator – 2
    d. COP of pump=COP of refrigerator + 2

23. Kelvin-Planck's and Clausius' statements are
    a. not connected to each other
    b. virtually two parallel statements of second law
    c. violation of one doesn't violate the other
    d. none of the mentioned

24. If one of the Kelvin-Planck's or Clausius' statement is violated, then other is also violated.
    a. true
    b. false

25. The transfer of heat between two bodies in direct contact is called
a. radiation
b. convection
c. conduction
d. none of the mentioned

26. The transfer of heat between a wall and a fluid system in motion is called
a. radiation
b. convection
c. conduction
d. none of the mentioned

27. The working cycle in case of four stroke engine is completed in following number of revolutions of crankshaft
a. 1/2
b. 1
c. 2
d. 4
e. 8

28. The Stefan Boltzman law states that
a. $E \alpha T$
b. $E \alpha T^2$
c. $E \alpha T^3$
d. $E \alpha T^4$

29. The body which absorbs all radiations incident upon it, is called as
a. Black body
b. White body
c. Opaque body
d. Transparent body

30. The process of heat transfer from one particle of the body to another without actual motion of the particle is called
a. Radiation
b. Conduction
c. Convection
d. None of these

31. A two stroke cycle engine gives _____ the number of power strokes as compared to the four stroke cycle engine, at the same engine speed.
a. half
b. same
c. double
d. four times

Q. No.	Solution		Q. No.	Solution
1	b		21	a
2	d		22	b
3	a		23	b
4	c		24	a
5	c		25	c
6	b		26	b
7	d		27	c
8	b		28	d
9	b		29	a
10	a		30	a
11	d		31	c
12	c			
13	a			
14	b			
15	a			
16	b			
17	c			
18	d			
19	a			
20	d			