



1. Thermal diffusivity of a substance is .

- (a) proportional of thermal conductivity
- (b) inversely proportional to k
- (c) proportional to (k)
- (d) inversely proportional to k^2
- (e) none of the above.

Ans: a

2. Thermal conductivity of glass-wool varies from sample to sample because of variation in

- (a) composition
- (b) density
- (c) porosity
- (d) structure
- (e) all of the above.

Ans: e

3. Thermal conductivity of a material may be defined as the

- (a) quantity of heat flowing in one second through one cm cube of material when opposite faces are maintained at a temperature difference of 1°C
- (b) quantity of heat flowing in one second through a slab of the material of area one cm square, thickness 1 cm when its faces differ in temperature by 1°C
- (c) heat conducted in unit time across unit area through unit thickness when a temperature difference of unity is maintained between opposite faces
- (d) all of the above
- (e) none of the above.

Ans: d

4. Which of the following has maximum value of thermal conductivity

- (a) aluminium
- (b) steel

- (c) brass
- (d) copper
- (e) lead.

Ans: a

5. Moisture would find its way into insulation by vapour pressure unless it is prevented by

- (a) high thickness of insulation
- (b) high vapour pressure
- (c) less thermal conductivity insulator
- (d) a vapour seal
- (e) all of the above.

Ans: d

6. Heat is transferred by all three modes of transfer, viz, conduction, convection and radiation in

- (a) electric heater
- (b) steam condenser
- (c) melting of ice
- (d) refrigerator condenser coils
- (e) boiler.

Ans: e

7. According to Prevost theory of heat exchange

- (a) it is impossible to transfer heat from low temperature source to a high temperature source
- (b) heat transfer by radiation requires no medium
- (c) all bodies above absolute zero emit radiation
- (d) heat transfer in most of the cases takes place by combination of conduction, convection and radiation
- (e) rate of heat transfer depends on thermal conductivity and temperature difference.

Ans: c

8. The ratio of heat flow Q_1/Q_2 from two walls of same thickness having their thermal conductivities as $k_1 - 2k_2$ will be

- (a) 1
- (b) 0.5
- (c) 2
- (d) 0.25
- (e) 4.0

Ans: c

9. Unit of thermal diffusivity is

- (a) m^2/hr
- (b) $m^2/hr^\circ C$
- (c) $kcal/m^2 hr$
- (d) $kcal/m.hr^\circ C$
- (e) $kcal/m^2 hr^\circ C$.

Ans: a

10. Thermal conductivity of wood depends on

- (a) moisture
- (b) density
- (c) temperature
- (d) all of the above
- (e) none of the above.

Ans: d

11. In convection heat transfer from hot flue gases to water tube, even though flow may be turbulent, a laminar flow region (boundary layer of film) exists close to the tube. The heat transfer through this film takes place by

- (a) convection



- (b) radiation
- (c) conduction
- (d) both convection and conduction
- (e) none of the above.

Ans: c

12. Film coefficient is defined as Inside diameter of tube

- (a) Equivalent thickness of film
- (b) Thermal conductivity Equivalent thickness of film Specific heat x Viscosity
- (c) Thermal conductivity Molecular diffusivity of momentum Thermal diffusivity
- (d) Film coefficient x Inside diameter Thermal conductivity
- (e) none of the above.

Ans: b

13. Heat conducted through unit area and unit thick face per unit time when temperature difference between opposite faces is unity, is called

- (a) thermal resistance
- (b) thermal coefficient
- (c) temperature gradient
- (d) thermal conductivity
- (e) heat-transfer.

Ans: d

14. The rate of energy emission from unit surface area through unit solid angle, along a normal to the surface, is known as

- (a) emissivity
- (b) transmissivity
- (c) reflectivity
- (d) intensity of radiation

(e) absorptivity.

Ans: d

15. Emissivity of a white polished body in comparison to a black body is

- (a) higher
- (b) lower
- (c) same
- (d) depends upon the shape of body
- (e) none of the above.

Ans: b

16. The insulation ability of an insulator with the presence of moisture would

- (a) increase
- (b) decrease
- (c) remain unaffected
- (d) may increase/decrease depending on temperature and thickness of insulation
- (e) none of the above.

Ans: b

17. When heat is Transferred by molecular collision, it is referred to as heat transfer by

- (a) conduction
- (b) convection
- (c) radiation
- (d) scattering
- (e) convection and radiation.

Ans: b

18. Heat transfer in liquid and gases takes place by

- (a) conduction



- (b) convection
- (c) radiation
- (d) conduction and convection
- (e) convection and radiation.

Ans: b

19. Which of the following is the case of heat transfer by radiation

- (a) blast furnace
- (b) heating of building
- (c) cooling of parts in furnace
- (d) heat received by a person from fireplace
- (e) all of the above.

Ans: d

20. Heat is closely related with

- (a) liquids
- (b) energy
- (c) temperature
- (d) entropy
- (e) enthalpy.

Ans: c

21. Pick up the wrong case. Heat flowing from one side to other depends directly on

- (a) face area
- (b) time
- (c) thickness
- (d) temperature difference
- (e) thermal conductivity.

Ans: c

22. Metals are good conductors of heat because

- (a) their atoms collide frequently
- (b) their atoms are relatively far apart
- (c) they contain free electrons
- (d) they have high density
- (e) all of the above.

Ans: a

23. The time constant of a thermocouple is

- (a) the time taken to attain the final temperature to be measured
- (b) the time taken to attain 50% of the value of initial temperature difference
- (c) the time taken to attain 63.2% of the value of initial temperature difference
- (d) determined by the time taken to reach 100°C from 0°C
- (e) none of the above.

Ans: c

24. Thermal conductivity of air with rise in temperature

- (a) increases
- (b) decreases
- (c) remains constant
- (d) may increase or decrease depending on temperature
- (e) none of the above.

Ans: a

25. Heat flows from one body to other when they have

- (a) different heat contents
- (b) different specific heat
- (c) different atomic structure

(d) different temperatures

(e) none of the above.

Ans: d

26. The concept of overall coefficient of heat transfer is used in heat transfer problems of

(a) conduction

(b) convection

(c) radiation

(d) all the three combined

(e) conduction and convection.

Ans: e

27. In heat transfer, conductance equals conductivity ($\text{kcal/hr/sqm}/^\circ\text{C/cm}$) divided by

(a) hr (time)

(b) sqm (area)

(c) $^\circ\text{C}$ (temperature)

(d) cm (thickness)

(e) kcal (heat).

Ans: d

28. Which of the following is a case of steady state heat transfer

(a) I.C. engine

(b) air preheaters

(c) heating of building in winter

(d) all of the above

(e) none of the above.

Ans: e

23. Total heat is the heat required to

- (a) change vapour into liquid
- (b) change liquid into vapour
- (c) increase the temperature of a liquid or vapour
- (d) convert water into steam and superheat it
- (e) convert saturated steam into dry steam.

Ans: d

24. Cork is a good insulator because it has

- (a) free electrons
- (b) atoms colliding frequency
- (c) low density
- (d) porous body
- (e) all of the above.

Ans: d

25. Thermal conductivity of water in general with rise in temperature

- (a) increases
- (b) decreases
- (c) remains constant
- (d) may increase or decrease depending on temperature
- (e) none of the above.

Ans: d

26. Thermal conductivity of water at 20°C is of the order of

- (a) 0.1
- (b) 0.23
- (c) 0.42
- (d) 0.51
- (e) 0.64.

Ans: d

27. Temperature of steam at around 540°C can be measured by

- (a) thermometer
- (b) radiation pyrometer
- (c) thermistor
- (d) thermocouple
- (e) thermopile.

Ans: d

28. Thermal conductivity of air at room temperature in $\text{kcal/m hr }^{\circ}\text{C}$ is of the order of

- (a) 0.002
- (b) 0.02
- (c) 0.01
- (d) 0.1
- (e) 0.5.

Ans: b

29. The amount of heat flow through a body by conduction is

- (a) directly proportional to the surface area of the body
- (b) directly proportional to the temperature difference on the two faces of the body
- (c) dependent upon the material of the body
- (d) inversely proportional to the thickness of the body
- (e) all of the above.

Ans: e

30. Which of the following has least value of conductivity

- (a) glass
- (b) water



- (c) plastic
- (d) rubber
- (e) air.

Ans: e

31. Which of the following is expected to have highest thermal conductivity

- (a) steam
- (b) solid ice
- (c) melting ice
- (d) water
- (e) boiling water.

Ans: b

32. Heat transfer by radiation mainly depends upon

- (a) its temperature
- (b) nature of the body
- (c) kind and extent of its surface
- (d) all of the above
- (e) none of the above.

Ans: d

33. Thermal diffusivity is

- (a) a dimensionless parameter
- (b) function of temperature
- (c) used as mathematical model
- (d) a physical property of the material
- (e) useful in case of heat transfer by radiation.

Ans: d

34. Unit of thermal conductivity in M.K.S. units is

- (a) kcal/kg m² °C
- (b) kcal-m/hr m² °C
- (c) kcal/hr m² °C
- (d) kcal-m/hr °C
- (e) kcal-m/m² °C.

Ans: b

35. Unit of thermal conductivity in S.I. units is

- (a) J/m² sec
- (b) J/m °K sec
- (c) W/m °K
- (d) (a) and (c) above
- (e) (b) and (c) above.

Ans: e

36. Thermal conductivity of solid metals with rise in temperature normally

- (a) increases
- (b) decreases
- (c) remains constant
- (d) may increase or decrease depending on temperature
- (e) unpredictable.

Ans: b

37. Thermal conductivity of non-metallic amorphous solids with decrease in temperature

- (a) increases
- (b) decreases
- (c) remains constant
- (d) may increase or decrease depending on temperature

(e) unpredictable.

Ans: b

38. Heat transfer takes place as per -

- (a) zeroth law of thermodynamics
- (b) first law of thermodynamic
- (c) second law of the thermodynamics
- (d) Kirchoff's law (e) Stefan's law.

Ans: c

39. When heat is transferred from one particle of hot body to another by actual motion of the heated particles, it is referred to as heat transfer by

- (a) conduction
- (b) convection
- (c) radiation
- (d) conduction and convection
- (e) convection and radiation.

Ans: a

40. When heat is transferred from hot body to cold body, in a straight line, without affecting the intervening medium, it is referred as heat transfer by

- (a) conduction
- (b) convection
- (c) radiation
- (d) conduction and convection
- (e) convection and radiation.

Ans: c

41. Sensible heat is the heat required to

- (a) change vapour into liquid
- (b) change liquid into vapour
- (c) increase the temperature of a liquid of vapour
- (d) convert water into steam and superheat it
- (e) convert saturated steam into dry steam.

Ans: c

42. A steam pipe is to be insulated by two insulating materials put over each other. For best results

- (a) better insulation should be put over pipe and better one over it
- (b) inferior insulation should be put over pipe and better one over it
- (c) both may be put in any order
- (d) whether to put inferior OIL over pipe or the better one would depend on steam temperature
- (e) unpredictable.

Ans: a