APPLIED PHYSICS

Subject Code: 4300002 **Date: 2025-04-05**

Subject Name: APPLIED PHYSICS

Time Duration: 92.0 minutes **Total Marks: 92**

---

1. An ice box of Styrofoam (Thermal Conductivity = 0.01 J/m.s.K)is used to keep liquid cool. It has a total wall area including lid of 0.8 m^2 and wall thickness of 2.0 cm. A bottle of water is placed in the box and filled with ice. If the outside temperature is 30°C. The rate of flow of heat into the box is _____.

2

○ 10 J/s ○ 10 J.s ◉ 12 J/s ○ 12 J.s

2. In which of the following process, convection does not take place primarily ?

2

- ○ Boiling of water
- ○ Heating air around a furnace
- ○ Sea and Land Breeze
- ◉ Warming of glass of bulb due to filament

3. Heat from the filament is transmitted through _____.

2

○ conduction ◉ radiation ○ convection ○ uv rays

4. A steel ball is brought with an identical ball of wood, then they will be equally hot or cold at what temperature ?

2

○ 98.4° C ○ 98.4° K ◉ 98.4° F ○ Room Temperature

5. A sphere, a cube and a thin circular plate. all of same materials and same mass are heated to same high temperature which of them will cool fastest.

2

◉ Plate ○ Sphere ○ Cube ○ All of them at same time

6. A big piece of glass is first heated and then is allowed to cool. On cooling down a crack is developed in it . One of the possible reason for this is _____.

2

- ○ High melting Point
- ○ Large Thermal Conductivity
- ○ Large Specific Heat
- ◉ Small Thermal Conductivity

7. At Atmospheric pressure, when equilibrium is established between pure water and its vapour temperature is taken ____ K

2

○ 273.15 ○ 100 ◉ 373.15 ○ 0

8. At what temperature do the fahrenite and Celcius scales concides ?

2

○ 0°F and 0°C ○ 40°C and 40°F ○ -40°C and 40°F ◉ -40°C and -40°F

9. Boiling point of water, which is used as one of the fixed point in the internation practical scale K is given by _____ K.

2

○ 100 ○ 212 ○ 273.15 ◉ 373.15

10. Freezing point of water, which is used as one of the fixed point in the internation practical scale K is given by _____ K.

2

○ 0 ○ 100 ◉ 273.15 ○ 373.15

11. A person weighing 60kg takes in 2000 kcal diet in a day. If this energy were to be used in heating the person without any losses. What would be the rise in temperature ? Given specific heat of human body is 0.83 cal g^{-1} $°C^{-1}$

2

○ 4.016°C ◉ 40.16°C ○ 104.3°F ○ Both B and C

12. Which of the following statements is true regarding thermal and electrical conductivity?

2

- ○ A good thermal conductor is always a poor electrical conductor.
- ◉ A good electrical conductor is also a good thermal conductor
- ○ A good thermal conductor is always an insulator
- ○ There is no relationship between thermal and electrical conductivity

13. The value of co-effcient of thermal conductivity (K) depends on _____.

2

◉ Nature of the solid ○ Temperature of solid ○ Both A and B ○ None

14. C.G.S unit of K

2

○ erg cm^{-1} s^{-1} $°C^{-1}$ ○ erg cm^{-1} s^{-1} K^{-1} ○ cal cm^{-1} s^{-1} K^{-1} ◉ All of Above

15. $\Delta Q / \Delta t$ $K = \frac{\Delta Q / \Delta t}{A \times (\Delta T / \Delta x)}$ Here the .....

2

- ○ K is thermal capacity, and temperature gradient is $\Delta T + \Delta x$
- ○ K is thermal resistivity, and temperature gradient is $\Delta T \times \Delta x$
- ○ K is thermal conductivity and temperature gradient is $\Delta Q / \Delta t$
- ◉ K is coefficient of thermal conductivity, and temperature gradient is $\Delta T / \Delta x$

16. What does the temperature gradient represent in heat transfer?

2

- ○ The ratio of heat energy to mass of the substance
- ○ The total heat energy stored in a material
- ◉ The fall of temperature with distance between two faces in the direction of heat flow
- ○ The increase in temperature with time in a body

17. Which of the following is a mode of heat transfer that does not require a medium ?

○ conduction ◉ Radiation ○ Convection ○ Expansion

2

18. Specific heat is the heat capacity per unit _____ .

◉ Mass ○ Volume ○ Area ○ Temperature

2

19. Which temperature scale is an absolute temperature scale ?

○ Celcius ◉ Kelvin ○ Fahrenhiet ○ Rankine

2

20. Which material would have generally have the highest thermal conductivity ?

○ Wood ◉ Aluminium ○ Styrofoam ○ Rubber

2

21. The mathematical formula for specific heat is _____ .

◉ $C = Q/m\Delta T$ ○ $Q = C/m\Delta T$ ○ $Hc = Q/\Delta L$ ○ $Q = Hc/\Delta T$

2

22. A person is having fever of 104°F. Convert it in Celcius.

○ 38°C ◉ 40°C ○ -40°C ○ -38°C

2

23. In which of the following process of heat transfer material is transported from one region to another ?

○ Conduction ◉ Convection ○ Radiation ○ None of These

2

24. The lowest theroectical possible temperature in nature is _____ .

◉ -273.15°C ○ 0°C ○ -100°C ○ 0°F

2

25. Heat energy required to increase temperature by 1K is called _____.

2

- ◉ Heat Capacity or Thermal Capacity
- ○ Latent Heat
- ○ Specific Heat
- ○ Internal Heat

26. SI unit of co-effecient of thermal conductivity is _____ .

○ $Wm^{-1}C^{-1}$ ○ $Jm^{-1}C^{-1}$ ◉ $Wm^{-1}K^{-1}$ ○ $Jm^{-1}K^{-1}$

2

27. SI unit of heat is _____ .

◉ Joule ○ Calorie ○ kWh ○ erg

2

28. The coefficient of linear thermal expansion of a material depends on _____ .

2

- ○ length of material
- ○ temperature difference
- ○ mass of the material
- ◉ nature of the material

29. Heat is transffered from one place to other due to difference in _____ .

2

○ Height ○ Energy ◉ Temperature ○ Electric Current

30. At what temperature do the Fahreneheit and Celsius scales coincide ?

2

○ 0 ○ 20 ○ 40 ◉ -40

31. 101°F = _____ °C

2

◉ 38.33 ○ 311.33 ○ 101 ○ 37

32. Which of the following is a unit of the rate of heat transfer ?

2

◉ Kelvin ○ Newton ○ Pascal ○ Watt

33. In Liquids and gases, heat transmission is primarily cause by _____ .

2

○ Conduction ◉ Convection ○ Radiation ○ Both A and B

34. In which phase of a substance does conduction mode of heat transfer take place ?

2

◉ solid ○ liquid ○ gaseous ○ all of above

35. What is the condition for conduction mode of heat transfer between two bodies ?

2

- ○ The two bodies must be in physical contact
- ○ There must be temperature gradient between two bodies
- ◉ both a and b
- ○ none of above

36. The fastest mode of heat transfer is _____.

2

○ Conduction ○ Convection ◉ Radiation ○ All are equally fast

37. Which of the following will expand most for the same rise in temperature ?

2

◉ Alumnium ○ Wood ○ Glass ○ All will expand

38. Woolen clothes are used in winter season because woolen clothes are

2

- ○ good sources for producing heat
- ○ absorbs heat from surroundings
- ◉ are bad conductor of heat
- ○ provide heat to body continously

39. By which mode of heat transfer does earth receive heat energy from sun ?

2

○ Conduction ○ Convection ◉ Radiation ○ All of these

40. Temperature of two ends of 2 m long metallic rod are 50°C and 100°C respectively. Find temperature gradient of the rod.

2

◉ 25°C/m ○ 50°C/m ○ 25°Cm ○ 50°Cm

41. SI unit of coeffecient of linear thermal expansion is _____ .

2

○ $°C^{-1}$ ○ $°F^{-1}$ ○ $°K^{-1}$ ◉ Both A and C

42. _____ is the measure of degree of hotnes or coldness of a body.

2

◉ Temperature ○ Thermometer ○ Humidity ○ Heat

43. What is the freezing point of water on the Celsius scale ?

2

○ 32°C ○ 273°C ○ 100°C ◉ 0°C

44. The process of heat transfer due to the temperature difference the adjacent parts of the object is called heat _____ .

2

◉ conduction ○ convection ○ radiation ○ refraction

45. The thermal conductivty of which material is highest ?

2

◉ Diamond ○ Silver ○ Aluminium ○ Copper

46. The thermal conductivity of which metal is highest ?

2

○ Diamond ◉ Silver ○ Alumnium ○ Copper