

## Physics - Thermodynamic processes

1. A container of volume  $1\text{m}^3$  is divided into two equal compartments by a partition. One of these compartments contains an ideal gas at  $300\text{ K}$ . The other compartment is vacuum. The whole system is thermally isolated from its surroundings. The partition is removed and the gas expands to occupy the whole volume of the container. Its temperature now would be . [Manipal MEE 199]

- |                                |                                |
|--------------------------------|--------------------------------|
| <input type="checkbox"/> 300 K | <input type="checkbox"/> 200 K |
| <input type="checkbox"/> 239 K | <input type="checkbox"/> 100 K |

2. Heat given to a system is  $35\text{ joules}$  and work done by the system is  $15\text{ joules}$ . The change in the internal energy of the system will be . [MP PET/PMT 1988]

- |                                         |                                        |
|-----------------------------------------|----------------------------------------|
| <input type="checkbox"/> $-50\text{ J}$ | <input type="checkbox"/> $30\text{ J}$ |
| <input type="checkbox"/> $20\text{ J}$  | <input type="checkbox"/> $50\text{ J}$ |

3. A container that suits the occurrence of an isothermal process should be made of . [Pb. PMT 2000]

- |                                 |                                |
|---------------------------------|--------------------------------|
| <input type="checkbox"/> Copper | <input type="checkbox"/> Wood  |
| <input type="checkbox"/> Glass  | <input type="checkbox"/> Cloth |

4. In adiabatic expansion. [DPMT 1999]

- |                                                       |                                                       |
|-------------------------------------------------------|-------------------------------------------------------|
| <input type="checkbox"/> $\Delta U$                   | <input type="checkbox"/> $\Delta U = \text{positive}$ |
| <input type="checkbox"/> $\Delta U = \text{negative}$ | <input type="checkbox"/> $\Delta W = \text{zero}$     |

5. When a gas expands adiabatically. [CPMT 1990]

- |                                                                                                    |                                                                           |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <input type="checkbox"/> No energy is required for expansion                                       | <input type="checkbox"/> Internal energy of the gas is used in doing work |
| <input type="checkbox"/> Energy is required and it comes from the wall of the container of the gas | <input type="checkbox"/> Law of conservation of energy does not hold      |

5. Which of the following processes is reversible . [CBSE PMT 2005]

- |                                                                |                                                         |
|----------------------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> Transfer of heat by radiation         | <input type="checkbox"/> Transfer of heat by conduction |
| <input type="checkbox"/> Electrical heating of a nichrome wire | <input type="checkbox"/> Isothermal compression         |

7. When heat is given to a gas in an isobaric process, then . [DPMT 2001]

- |                                                               |                                                |
|---------------------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> The work is done by the gas          | <input type="checkbox"/> Both (a) and (b)      |
| <input type="checkbox"/> Internal energy of the gas increases | <input type="checkbox"/> None from (a) and (b) |

8. A vessel containing  $5\text{ litres}$  of a gas at  $0.8\text{ m}$  pressure is connected to an evacuated vessel of volume  $3\text{ litres}$ . The resultant pressure inside will be (assuming whole system to

be isolated). [MP PMT 1993]

- |                                |                                |
|--------------------------------|--------------------------------|
| <input type="checkbox"/> 4/3 m | <input type="checkbox"/> 2.0 m |
| <input type="checkbox"/> 0.5 m | <input type="checkbox"/> 3/4 m |

9. The work done in which of the following processes is zero . [UPSEAT 2003]

- |                                             |                                            |
|---------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Isothermal process | <input type="checkbox"/> Isochoric process |
| <input type="checkbox"/> Adiabatic process  | <input type="checkbox"/> None of these     |

10. The work done in an adiabatic change in a gas depends only on . [CPMT 1971; MP P]

- |                                             |                                                |
|---------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> Change in pressure | <input type="checkbox"/> Change in temperature |
| <input type="checkbox"/> Change in volume   | <input type="checkbox"/> None of the above     |

11. Compressed air in the tube of a wheel of a cycle at normal temperature suddenly starts coming out from a puncture. The air inside. [NCERT 1970]

- |                                                          |                                                                                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Starts becoming hotter          | <input type="checkbox"/> Starts becoming cooler                                                        |
| <input type="checkbox"/> Remains at the same temperature | <input type="checkbox"/> May become hotter or cooler depending upon the amount of water vapour present |

12. A thermally insulated container is divided into two parts by a screen. In one part the pressure and temperature are P and T for an ideal gas filled. In the second part it is vacuum. If now a small hole is created in the screen, then the temperature of the gas will. [RPET 1999]

- |                                   |                                            |
|-----------------------------------|--------------------------------------------|
| <input type="checkbox"/> Decrease | <input type="checkbox"/> Remain same       |
| <input type="checkbox"/> Increase | <input type="checkbox"/> None of the above |

13. Which of the following is not a thermodynamics co-ordinate . [AIIMS 2001]

- |                            |                            |
|----------------------------|----------------------------|
| <input type="checkbox"/> P | <input type="checkbox"/> V |
| <input type="checkbox"/> T | <input type="checkbox"/> R |

14. Which of the following is not thermodynamical function . [CBSE PMT 1993; ]

- |                                    |                                          |
|------------------------------------|------------------------------------------|
| <input type="checkbox"/> Enthalpy  | <input type="checkbox"/> Gibb's energy   |
| <input type="checkbox"/> Work done | <input type="checkbox"/> Internal energy |

15. If the amount of heat given to a system be 35 joules and the amount of work done by the system be joules, then the change in the internal energy of the system is . [MP PMT 1989]

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| <input type="checkbox"/> -50 joules | <input type="checkbox"/> 30 joules |
| <input type="checkbox"/> 20 joules  | <input type="checkbox"/> 50 joules |





32. Which of the following statements is correct for any thermodynamic system . [AIEEE 2004]

- The internal energy changes in all processes
- Internal energy and entropy are state functions
- The change in entropy can never be zero
- The work done in an adiabatic process is always zero

33. The first law of thermodynamics is concerned with the conservation of. [DCE 2000; BCECE]

- Momentum
- Energy
- Mass
- Temperature

34. A thermodynamic system goes from states (i)  $P_1, V$  to  $2P_1, V$  (ii)  $P, V$  to  $P, 2V$ . Then work done in the two cases is . [MP PMT 1990]

- Zero, Zero
- Zero,  $PV_1$
- $PV_1, Zero$
- $PV_1, P_1V_1$

35. Find the change in internal energy of the system when a system absorbs 2 kilocalorie of heat and at the same time does 500 joule of work. [EAMCET 1984]

- 7900 J
- 8200 J
- 5600 J
- 6400 J

36. First law of thermodynamics is a special case of . [ AIEEE 2002; AF]

- Newton's law
- Law of conservation of energy
- Charle's law
- Law of heat exchange

37. In isothermal expansion, the pressure is determined by . [AFMC 1995]

- Temperature only
- Compressibility only
- Both temperature and compressibility
- None of these

38. Entropy of a thermodynamic system does not change when this system is used for. [AIIMS 1995]

- Conduction of heat from a hot reservoir to a cold reservoir
- Conversion of heat into work isobarically
- Conversion of heat into internal energy isochorically
- Conversion of work into heat isochorically

39. In isothermic process, which statement is wrong . [RPMT 1997]

- Temperature is constant
- Internal energy is constant
- No exchange of energy
- (a) and (b) are correct

40. A monoatomic gas of  $n$ -moles is heated from temperature  $T_1$  to  $T_2$  under two different conditions (i) at constant volume and (ii) at constant pressure. The change in internal energy of the gas is . [CPMT 2000]

- More for (i)                       Same in both cases  
 More for (ii)                      Independent of number of moles

41. Air in a cylinder is suddenly compressed by a piston, which is then maintained at the same position. With the passage of time . [KCET 2000; AIIM]

- The pressure decreases       The pressure remains the same  
 The pressure increases        The pressure may increase or decrease depending upon the nature of the gas

42. In a cyclic process, the internal energy of the gas

- Increases                               Remains constant  
 Decreases                              Becomes zero

43. When the amount of work done is 333 cal and change in internal energy is 167 cal, then the heat supplied is . [AFMC 1998]

- 166 cal                                 500 cal  
 333 cal                                 400 cal

44. Work done on or by a gas, in general depends upon the

- Initial state only                     Both initial and final states only  
 Final state only                      Initial state, final state and the path

45. Which of the following can not determine the state of a thermodynamic system. [AFMC 2001]

- Pressure and volume                Temperature and pressure  
 Volume and temperature           Any one of pressure, volume or temperature

46. A thermodynamic process in which temperature  $T$  of the system remains constant though other variable  $P$  and  $V$  may change, is called. [Pb. PMT 2004]

- Isochoric process                     Isobaric process  
 Isothermal process                    None of these

47. In changing the state of thermodynamics from  $A$  to  $B$  state, the heat required is  $Q$  and the work done by the system is  $W$ . The change in its internal energy is . [MP PMT 1986; AM]

- $Q + W$                                   $Q$   
  $Q - W$                                   $(Q - W)/2$

48. Can two isothermal curves cut each other

- Never       They will cut when temperature is  $0^{\circ}\text{C}$   
 Yes       Yes, when the pressure is critical pressure

49. A system performs work when an amount of heat is added to the system, the corresponding change in the internal energy is . A unique function of the initial and final states (irrespective of the mode of change) is . [CPMT 1981; J & ]

- $\Delta Q$         $\Delta U$  and  $\Delta Q$   
  $\Delta W$         $\Delta U$

50. First law thermodynamics states that. [KCET 1999]

- System can do work       System has pressure  
 System has temperature       Heat is a form of energy

## Physics - Thermometry Thermal Expansion and Calorimetry

1. The temperature of a substance increases by  $27^{\circ}\text{C}$ . On the Kelvin scale this increase is equal to. [CPMT 1993]

- |                                 |                               |
|---------------------------------|-------------------------------|
| <input type="checkbox"/> 300 K  | <input type="checkbox"/> 27 K |
| <input type="checkbox"/> 2.46 K | <input type="checkbox"/> 7 K  |

2. A litre of alcohol weighs . [AFMC 1994]

- |                                                        |                                                         |
|--------------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> Less in winter than in summer | <input type="checkbox"/> Some both in summer and winter |
| <input type="checkbox"/> Less in summer than in winter | <input type="checkbox"/> None of the above              |

3. A device used to measure very high temperature is . [KCET 1998]

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> Pyrometer   | <input type="checkbox"/> Bolometer   |
| <input type="checkbox"/> Thermometer | <input type="checkbox"/> Calorimeter |

4. 80 gm of water at  $30^{\circ}\text{C}$  are poured on a large block of ice at  $0^{\circ}\text{C}$ . The mass of ice that melts is. [CBSE PMT 1989]

- |                                |                                  |
|--------------------------------|----------------------------------|
| <input type="checkbox"/> 30 gm | <input type="checkbox"/> 1600 gm |
| <input type="checkbox"/> 80 gm | <input type="checkbox"/> 150 gm  |

5. On which of the following scales of temperature, the temperature is never negative. [EAMCET 1997]

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/> Celsius    | <input type="checkbox"/> Reaumur |
| <input type="checkbox"/> Fahrenheit | <input type="checkbox"/> Kelvin  |

6. The absolute zero is the temperature at which . [AIIMS 1998]

- |                                                              |                                                  |
|--------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Water freezes                       | <input type="checkbox"/> Molecular motion ceases |
| <input type="checkbox"/> All substances exist in solid state | <input type="checkbox"/> None of the above       |

7. When a rod is heated but prevented from expanding, the stress developed is independent of . [EAMCET 1997]

- |                                              |                                        |
|----------------------------------------------|----------------------------------------|
| <input type="checkbox"/> Material of the rod | <input type="checkbox"/> Length of rod |
| <input type="checkbox"/> Rise in temperature | <input type="checkbox"/> None of above |

8. One quality of a thermometer is that its heat capacity should be small. If P is a mercury thermometer, Q is a resistance thermometer and R thermocouple type then. [CPMT 1997]

- |                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> P is best, R worst | <input type="checkbox"/> R is best, Q worst |
| <input type="checkbox"/> R is best, P worst | <input type="checkbox"/> P is best, Q worst |

9. 'Stem Correction' in platinum resistance thermometers are eliminated by the use of . [AIIMS 1998]

- Cells  Compensating leads  
 Electrodes  None of the above

10. Absolute temperature can be calculated by. [AFMC 1994]

- Mean square velocity  Both (a) and (b)  
 Motion of the molecule  None of the above

11. The absolute zero temperature in Fahrenheit scale is . [DCE 1996]

- 273°F  - 460°F  
 - 32°F  - 132°F

12. Expansion during heating . [CBSE PMT 1994]

- Occurs only in solids  Decreases the density of a material  
 Increases the weight of a material  Occurs at the same rate for all liquids and solids

13. When a bimetallic strip is heated, it . [CBSE PMT 1990]

- Does not bend at all  Bend in the form of an arc with the more expandable metal outside  
 Gets twisted in the form of an helix  Bends in the form of an arc with the more expandable metal inside

14. An iron bar of length 10 m is heated from 0°C to 100°C. If the coefficient of linear thermal expansion of iron is  $10 \times 10^{-6} / ^\circ\text{C}$ , the increase in the length of bar is . [UPSEAT 2005]

- 0.5 cm  1.5 cm  
 1.0 cm  2.0 cm

15. If the length of a cylinder on heating increases by 2%, the area of its base will increase by . [CPMT 1993; BHU ]

- 0.5%  1%  
 2%  4%

16. Coefficient of real expansion of mercury is  $0.18 \times 10^{-3} / ^\circ\text{C}$ . If the density of mercury at 0°C is 13.6 gm/cc. its density at 473K is . [DPMT 1996]

- 13.11 gm/cc  52.11 gm/cc  
 26.22 gm/cc  None of these

17. On heating a liquid of coefficient of cubical expansion  $\gamma$  in a container having coefficient of linear expansion  $\gamma / 3$ , the level of liquid in the container will . [EAMCET

1993]

- Rise                       Will remain almost stationary  
 Fall                         It is difficult to say

18. Thermoelectric thermometer is based on . [CPMT 1993, 95; ]

- Photoelectric effect                       Compton effect.  
 Seebeck effect                               Joule effect

19. A solid ball of metal has a concentric spherical cavity within it. If the ball is heated, the volume of the cavity will . [AFMC 1997; Oris]

- Increase                                       Remain unaffected  
 Decrease                                       None of these

20. At some temperature T, a bronze pin is a little large to fit into a hole drilled in a steel block. The change in temperature required for an exact fit is minimum when . [SCRA 1998]

- Only the block is heated                       Both block and pin are cooled together  
 Both block and pin are heated together       Only the pin is cooled

16. Coefficient of real expansion of mercury is  $0.18 \times 10^{-3}/^{\circ}\text{C}$ . If the density of mercury at  $0^{\circ}\text{C}$  is  $13.6 \text{ gm/cc}$ . its density at  $473\text{K}$  is . [DPMT 1996]

- $13.11 \text{ gm/cc}$                                         $52.11 \text{ gm/cc}$   
  $26.22 \text{ gm/cc}$                                        None of these

17. On heating a liquid of coefficient of cubical expansion  $\gamma$  in a container having coefficient of linear expansion  $\gamma / 3$ , the level of liquid in the container will . [EAMCET 1993]

- Rise                                               Will remain almost stationary  
 Fall                                                 It is difficult to say

18. Thermoelectric thermometer is based on . [CPMT 1993, 95; ]

- Photoelectric effect                       Compton effect.  
 Seebeck effect                               Joule effect

19. A solid ball of metal has a concentric spherical cavity within it. If the ball is heated, the volume of the cavity will . [AFMC 1997; Oris]

- Increase                                       Remain unaffected  
 Decrease                                       None of these

20. At some temperature T, a bronze pin is a little large to fit into a hole drilled in a steel block. The change in temperature required for an exact fit is minimum when . [SCRA

1998]

- Only the block is heated       Both block and pin are cooled together  
 Both block and pin are heated together       Only the pin is cooled

21. If mass energy equivalence is taken into account, when water is cooled to form ice, the mass of water should . [AIEEE 2002]

- Increase       Decrease  
 Remain unchanged       First increase then decrease

22. A brass disc fits simply in a hole of a steel plate. The disc from the hole can be loosened if the system . [UPSEAT 2001]

- First heated then cooled       Is heated  
 First cooled then heated       Is cooled

23. Water is used to cool radiators of engines, because . [AFMC 2001]

- Of its lower density       It is cheap  
 It is easily available       It has high specific heat

24. By exerting a certain amount of pressure on an ice block, you. [JIPMER 1997]

- Lower its melting point       Make it melt at a faster rate  
 Make it melt at  $0^{\circ}\text{C}$  only       Raise its melting point

25. The thermal capacity of 40 gm of aluminium (specific heat =  $0.2 \text{ cal/gm}^{\circ}\text{C}$ ) is. [CBSE PMT 1990]

- 40  $\text{cal}^{\circ}\text{C}$        200  $\text{cal}^{\circ}\text{C}$   
 160  $\text{cal}^{\circ}\text{C}$        8  $\text{cal}^{\circ}\text{C}$

26. A metallic ball and highly stretched spring are made of the same material and have the same mass. They are heated so that they melt, the latent heat required. [AIIMS 2002]

- Are the same for both       Is greater for the spring  
 Is greater for the ball       For the two may or may not be the same depending upon the metal

27. The saturation vapour pressure of water at  $100^{\circ}\text{C}$  is . [EAMCET 1997]

- 739 mm of mercury       760 mm of mercury  
 750 mm of mercury       712 mm of mercury

28. A closed bottle containing water at  $30^{\circ}\text{C}$  is carried to the moon in a space-ship. If it is placed on the surface of the moon, what will happen to the water as soon as the lid is opened. [RPMT 2002]

- Water will boil
- Water will freeze
- Nothing will happen on it
- It will decompose into  $H_2$  and  $O_2$

29. Mercury thermometers can be used to measure temperatures upto . [CBSE PMT 1992, ]

- $100^\circ C$
- $212^\circ C$
- $360^\circ C$
- $500^\circ C$

30. A quantity of heat required to change the unit mass of a solid substance, from solid state to liquid state, while the temperature remains constant, is known as. [AIIMS 1998]

- Latent heat
- Sublimation
- Hoar frost
- Latent heat of fusion

31. When vapour condenses into liquid. [CPMT 1990]

- It absorbs heat
- It liberates heat
- Its temperature increases
- Its temperature decreases

32. In cold countries, water pipes sometimes burst, because

- Pipe contracts
- Water expands on freezing
- When water freezes, pressure increases
- When water freezes, it takes heat from pipes

33. The factor not needed to calculate heat lost or gained when there is no change of state is. [AFMC 1997; BHU ]

- Weight
- Specific heat
- Relative density
- Temperature change

34. Compared to a burn due to water at  $100^\circ C$ , a burn due to steam at  $100^\circ C$  is. [KCET 1999; UPSE]

- More dangerous
- Less dangerous
- Equally dangerous
- None of these

35. The gas thermometers are more sensitive than liquid thermometers because. [CPMT 1993]

- Gases expand more than liquids
- Gases are easily obtained
- Gases are much lighter
- Gases do not easily change their states

36. On the Celsius scale the absolute zero of temperature is at . [CBSE PMT 1994]

- $0^\circ C$
- $-32^\circ C$
- $100^\circ C$
- $-273.15^\circ C$

37. Oxygen boils at  $-183^{\circ}\text{C}$ . This temperature is approximately . [CPMT 1992]

- $215^{\circ}\text{F}$    $329^{\circ}\text{F}$   
  $-297^{\circ}\text{F}$    $361^{\circ}\text{F}$

38. The latent heat of vaporization of a substance is always . [SCRA 1998]

- Greater than its latent heat of fusion  Equal to its latent heat of sublimation  
 Greater than its latent heat of sublimation  Less than its latent heat of fusion

39. The temperature on Celsius scale is  $25^{\circ}\text{C}$ . What is the corresponding temperature on the Fahrenheit scale . [AFMC 2001]

- $40^{\circ}\text{F}$    $50^{\circ}\text{F}$   
  $77^{\circ}\text{F}$    $45^{\circ}\text{F}$

40. The study of physical phenomenon at low temperatures (below liquid nitrogen temperature) is called. [CPMT 1992]

- Refrigeration  Cryogenics  
 Radiation  Pyrometry

41. At atmospheric pressure, the water boils at  $100^{\circ}\text{C}$ . If pressure is reduced, it will boil at. [MP PMT 1984]

- Higher temperature  At the same temperature  
 Lower temperature  At critical temperature

42. Melting point of ice. [CBSE PMT 1993]

- Increases with increasing pressure  Is independent of pressure  
 Decreases with increasing pressure  Is proportional to pressure

43. Maximum density of  $\text{H}_2\text{O}$  is at the temperature . [CPMT 1996; Pb. ]

- $32^{\circ}\text{F}$    $42^{\circ}\text{F}$   
  $39.2^{\circ}\text{F}$    $4^{\circ}\text{F}$

44. Standardisation of thermometers is obtained with . [CPMT 1996]

- Jolly's thermometer  Thermocouple thermometer  
 Platinum resistance thermometer  Gas thermometer

45. At NTP water boils at  $100^{\circ}\text{C}$ . Deep down the mine, water will boil at a temperature. [CPMT 1996]

- $100^{\circ}\text{C}$    $< 100^{\circ}\text{C}$   
  $> 100^{\circ}\text{C}$   Will not boil at all

46. The resistance of a resistance thermometer has values 2.71 and 3.70 ohm at  $10^{\circ}\text{C}$  and  $100^{\circ}\text{C}$ . The temperature at which the resistance is 3.26 ohm is. [CPMT 1994]

- $40^{\circ}\text{C}$    $60^{\circ}\text{C}$   
  $50^{\circ}\text{C}$    $70^{\circ}\text{C}$

47. Water has maximum density at . [Pb. PMT 1997]

- $0^{\circ}\text{C}$    $-4^{\circ}\text{C}$   
  $32^{\circ}\text{F}$    $4^{\circ}\text{C}$

48. A beaker is completely filled with water at  $4^{\circ}\text{C}$ . It will overflow if . [EAMCET 1992; BH]

- Heated above  $4^{\circ}\text{C}$   Both heated and cooled above and below  $4^{\circ}\text{C}$  respectively  
 Cooled below  $4^{\circ}\text{C}$   None of the above

49. Mercury boils at  $367^{\circ}\text{C}$ . However, mercury thermometers are made such that they can measure temperature up to  $500^{\circ}\text{C}$ . This is done by. [CPMT 2004]

- Maintaining vacuum above mercury column in the stem of the thermometer  Filling nitrogen gas at low pressure above the mercury level  
 Filling nitrogen gas at high pressure above the mercury column  Filling oxygen gas at high pressure above the mercury column

50. The temperature of the sun is measured with . [Pb. PMT 1998; C]

- Platinum thermometer  Pyrometer  
 Gas thermometer  Vapour pressure thermometer

### **Physics - Transmission of heat**

1. Distribution of energy in the spectrum of a black body can be correctly represented by. [MP PMT 1989]

- Wien's law  Planck's law  
 Stefan's law  Kirchhoff's law

2. There is a rough black spot on a polished metallic plate. It is heated upto  $1400\text{ K}$  approximately and then at once taken in a dark room. Which of the following statements is true . [NCERT 1984; CPM]

- In comparison with the plate, the spot will shine more  The spot and the plate will be equally bright  
 In comparison with the plate, the spot will appear more black  The plate and the black spot can not be seen in the dark room

3. Temperature of water at the surface of lake is Then temperature of water just below the

lower surface of ice layer is . [RPET2000]

- 4 °C
- 0 °C
- 4 °C
- 20 °C

4. When two ends of a rod wrapped with cotton are maintained at different temperatures and after some time every point of the rod attains a constant temperature, then . [MP PET/PMT 1988]

- Conduction of heat at different points of the rod stops because the temperature is not increasing
- Rod is bad conductor of heat
- Heat is being radiated from each point of the rod
- Each point of the rod is giving heat to its neighbour at the same rate at which it is receiving heat

5. On a cold morning, a metal surface will feel colder to touch than a wooden surface because . [AIIMS 1998]

- Metal has high specific heat
- Metal has high thermal conductivity
- Metal has low specific heat
- Metal has low thermal conductivity

6. In which case the thermal conductivity increases from left to right. [NCERT 1974, 76;]

- Al, Cu, Ag
- Ag, Cu, Al
- Cu, Ag, Al
- Al, Ag, Cu

7. The wavelength of radiation emitted by a body depends upon. [MP PMT 1992]

- The nature of its surface
- The area of its surface
- The temperature of its surface
- All the above factors

8. Half part of ice block is covered with black cloth and rest half is covered with white cloth and then it is kept in sunlight. After some time clothes are removed to see the melted ice. Which of the following statements is correct

- Ice covered with white cloth will melt more
- Ice covered with black cloth will melt more
- Equal ice will melt under both clothes
- It will depend on the temperature of surroundings of ice

9. If black wire of platinum is heated, then its colour first appear red, then yellow and finally white. It can be understood on the basis of. [MP PMT 1984]

- Wien's displacement law
- Prevost theory of heat exchange
- Newton's law of cooling
- None of the above

10. The rate of loss of heat from a body cooling under conditions of forced convection is proportional to its (A) heat capacity (B) surface area (C) absolute temperature (D) excess of temperature over that of surrounding : state if . [NCERT 1982]

- A, B, C are correct                       Only B and D are correct  
 Only A and C are correct                 Only D is correct

11. In heat transfer, which method is based on gravitation . [CBSE PMT 2000]

- Natural convection                       Radiation  
 Conduction                                 Stirring of liquids

12. Mud houses are cooler in summer and warmer in winter because . [BVP 2003]

- Mud is superconductor of heat             Mud is bad conductor of heat  
 Mud is good conductor of heat             None of these

13. A piece of glass is heated to a high temperature and then allowed to cool. If it cracks, a probable reason for this is the following property of glass. [CPMT 1985]

- Low thermal conductivity                 High specific heat  
 High thermal conductivity                 High melting point

14. If a liquid is heated in weightlessness, the heat is transmitted through. [RPMT1996]

- Conduction     Radiation  
 Convection     Neither, because the liquid cannot be heated in weightlessness

15. Four pieces of iron heated in a furnace to different temperatures show different colours listed below. Which one has the highest temperature. [MP PET 1992]

- White                                               Orange  
 Yellow                                               Red

16. If the temperature of the sun becomes twice its present temperature, then. [MP PET 1989; RP]

- Radiated energy would be predominantly in infrared                       Radiated energy would be predominantly in X-ray region  
 Radiated energy would be predominantly in ultraviolet                       Radiated energy would become twice the present radiated energy

17. The thermal conductivity of a material in CGS system is 0.4. In steady state, the rate of flow of heat 10 cal/sec-cm<sup>2</sup>, then the thermal gradient will be . [MP PMT 1989]

- 10 °C /cm                                       25 °C /cm  
 12 °C /cm                                       20 °C /cm

18. While measuring the thermal conductivity of a liquid, we keep the upper part hot and lower part cool, so that . [CPMT 1985; MP P]

- Convection may be stopped                 Heat conduction is easier downwards

- Radiation may be stopped       It is easier and more convenient to do so

19. At a common temperature, a block of wood and a block of metal feel equally cold or hot. The temperatures of block of wood and block of metal are. [AIIMS 1999]

- Equal to temperature of the body       Greater than temperature of the body  
 Less than the temperature of the body       Either (b) or (c)

20. In variable state, the rate of flow of heat is controlled by

- Density of material       Thermal conductivity  
 Specific heat       All the above factors

21. Which of the following cylindrical rods will conduct most heat, when their ends are maintained at the same steady temperature . [CPMT 1981; NCER]

- Length 1 m; radius 1 cm       Length 2 m; radius 2 cm  
 Length 2 m; radius 1 cm       Length 1 m; radius 2 cm

22. In order that the heat flows from one part of a solid to another part, what is required . [Pb. PMT 1999; E]

- Uniform density       Temperature gradient  
 Density gradient       Uniform temperature

23. A thermos flask is polished well. [AFMC 1996]

- To make attractive       To absorb all radiations from outside  
 For shining       To reflect all radiations from outside

24. The coefficient of thermal conductivity depends upon . [MP PET/PMT 1984]

- Temperature difference of two surfaces       Thickness of the plate  
 Area of the plate       Material of the plate

25. An object is at a temperature of  $400^{\circ}\text{C}$ . At what temperature would it radiate energy twice as fast? The temperature of the surroundings may be assumed to be negligible. [MP PMT 1990; DP]

- $200^{\circ}\text{C}$         $800^{\circ}\text{C}$   
 200K       800 K

26. It is hotter for the same distance over the top of a fire than it is in the side of it, mainly because . [NCERT 1976, 79,]

- Air conducts heat upwards       Convection takes more heat upwards  
 Heat is radiated upwards       Convection, conduction and radiation all contribute significantly transferring heat upwards

27. The heat is flowing through two cylindrical rods of same material. The diameters of the rods are in the ratio 1 : 2 and their lengths are in the ratio 2 : 1. If the temperature difference between their ends is the same, the ratio of rate of flow of heat through them will be . [NCERT 1982; CBS]

- 1 : 1
- 2 : 1
- 1 : 4
- 1 : 8

28. A slab consists of two parallel layers of copper and brass of the same thickness and having thermal conductivities in the ratio 1 : 4. If the free face of brass is at and that of copper at , the temperature of interface is . [IIT 1981; MP PM]

- 80°C
- 20°C
- 60°C
- 40°C

29. For proper ventilation of building, windows must be open near the bottom and top of the walls so as to let pass

- In more air
- In cool air near the bottom and hot air out near the roof
- In hot air near the roof and cool air out near the bottom
- Out hot air near the roof

30. The energy supply being cut-off, an electric heater element cools down to the temperature of its surroundings, but it will not cool further because . [CPMT 2001]

- Supply is cut off
- It is made of metal
- Surroundings are radiating
- Element & surroundings have same temp.

31. For cooking the food, which of the following type of utensil is most suitable . [MP PMT/PET 1998]

- High specific heat and low conductivity
- High specific heat and high conductivity
- Low specific heat and low conductivity
- Low specific heat and high conductivity

32. Under steady state, the temperature of a body. [CPMT 1978]

- Increases with time
- Decreases with time
- Does not change with time and is same at all the points of the body
- Does not change with time but is different at different points of the body

33. As compared to the person with white skin, the person with black skin will experience. [CPMT 1988]

- Less heat and more cold
- More heat and more cold
- More heat and less cold
- Less heat and less cold

34. Infrared radiation is detected by. [AIEEE 2002]

- Spectrometer  Nanometer  
 Pyrometer  Photometer

35. The temperature of hot and cold end of a 20cm long rod in thermal steady state are at  $100^{\circ}\text{C}$  and  $20^{\circ}\text{C}$  respectively. Temperature at the centre of the rod is. [MP PMT 1996]

- $50^{\circ}\text{C}$    $40^{\circ}\text{C}$   
  $60^{\circ}\text{C}$    $30^{\circ}\text{C}$

36. The velocity of heat radiation in vacuum is . [EAMCET 1982; KC]

- Equal to that of light  Greater than that of light  
 Less than that of light  Equal to that of sound

37. The amount of radiation emitted by a perfectly black body is proportional to. [CPMT 1974, 98, ]

- Temperature on ideal gas scale  Fourth power of temperature on ideal gas scale  
 Fourth root of temperature on ideal gas scale  Square of temperature on ideal gas scale

38. In which process, the rate of transfer of heat is maximum . [EAMCET 1977; MP]

- Conduction  Radiation  
 Convection  In all these, heat is transferred with the same velocity

39. Mode of transmission of heat, in which heat is carried by the moving particles, is . [KCET 1999]

- Radiation  Convection  
 Conduction  Wave motion

40. Two stars emit maximum radiation at wavelength  $3600\text{ \AA}$  and  $4800\text{ \AA}$  respectively. The ratio of their temperatures is . [MP PMT 1991]

- 1 : 2  4 : 3  
 3 : 4  2 : 1