

Thermal Properties of Matter

Question 1.

Two stars A and B radiate maximum energy at 3600°A and 3600°A respectively. Then the ratio of absolute temperatures of A and B is

- (a) 256 : 81
- (b) 81 : 256
- (c) 3 : 4
- (d) 4 : 3

▼ Answer

Answer: (d) 4 : 3

Question 2.

Which of the following will radiate heat to large extent?

- (a) Rough surface
- (b) Polished surface
- (c) Black rough surface
- (d) Black polished surface

▼ Answer

Answer: (c) Black rough surface

Question 3.

Two spheres made of same material have radii in the ratio 2 : 1. if both the spheres are at same temperature, then what is the ratio of heat radiation energy emitted per second by them?

- (a) 1 : 4
- (b) 4 : 1
- (c) 3 : 4
- (d) 4 : 3

▼ Answer

Answer: (b) 4 : 1

Question 4.

The earth intercepts approximately one billionth of the power radiated by the sun. if the surface temperature of the sun were to drop by a factor of 2, the average radiant energy incident on earth per second would reduce by factor of

- (a) 2
- (b) 4
- (c) 8
- (d) 16

▼ Answer

Answer: (d) 16

Question 5.

A bucket full of hot water is kept in a room and it cools from 75°C to 70°C in t_1 minutes from 70°C to 65°C in t_2 minutes and from 65°C to 60°C in t_3 minutes; then

- (a) $t_1 - t_2 = t_3$
- (b) $t_1 < t_2 < t_3$

- (c) $t_1 > t_2 > t_3$
(d) $t_1 < t_2 > t_3$

▼ Answer

Answer: (b) $t_1 < t_2 < t_3$

Question 6.

A sphere, a cube and a thin circular plate, all made of the same material and having the same mass are initially heated to a temperature of 3000°K , which of these will cool fastest?

- (a) Sphere
(b) Cube
(c) Plate
(d) None

▼ Answer

Answer: (c) Plate

Question 7.

A perfectly black body emits radiation at temperature T^1 K. if it is to radiate 16 times this power, its temperature T^2 . will be

- (a) $T^2 = 16 T^1$
(b) $T^2 = 8 T^1$
(c) $T^1 = 4 T^1$
(d) $T^2 = 2 T^1$

▼ Answer

Answer: (d) $T^2 = 2 T^1$

Question 8.

Unit of Stefans constant is given by

- (a) W/ m K^2
(b) $\text{W/ m}^2 \text{ K}^2$
(c) $\text{W}^2/ \text{m}^2 \text{ K}^4$
(d) W/ mK

▼ Answer

Answer: (b) $\text{W/ m}^2 \text{ K}^2$

Question 9.

The good absorber of heat are

- (a) Non-emitter
(b) Poor-emitter
(c) Good-emitter
(d) Highly polished

▼ Answer

Answer: (c) Good-emitter

Question 10.

A black body is at a temperature of 500K . it emits energy at a rate which is proportional to

- (a) 500
- (b) $(500)^2$
- (c) $(500)^3$
- (d) $(500)^4$

▼ Answer

Answer: (d) $(500)^4$

Question 11.

The coefficient of transmission of a perfectly black body is

- (a) Zero
- (b) One
- (c) 0.5
- (d) 0.75

▼ Answer

Answer: (a) Zero

Question 12.

Newtons law of cooling is also applicable to

- (a) Convection losses
- (b) Natural convection losses
- (c) Forced convection losses
- (d) None of the above

▼ Answer

Answer: (c) Forced convection losses

Question 13.

A sphere, a cube and a thin circular plate all made of the same material and having the same mass are initially heated to a temperature of 300°C . which one of these cools faster?

- (a) Circular plate
- (b) Sphere
- (c) Cube
- (d) All will cool at the same rate

▼ Answer

Answer: (a) Circular plate

Question 14.

A sphere, a cube and a thin circular plate, all made of the same material and having the same mass are initially heated to a temperature of 3000°K , which of these will cool fastest?

- (a) Sphere
- (b) Cube
- (c) Plate
- (d) None

▼ Answer

Answer: (c) Plate

Question 15.

Which of the following statement is wrong?

- (a) Rough surfaces are better radiators than smooth surfaces
- (b) Highly polished mirror surfaces are very good radiators
- (c) Black surfaces are better absorbers than white ones
- (d) Black surfaces are better radiators than white ones

▼ Answer

Answer: (b) Highly polished mirror surfaces are very good radiators

Question 16.

In which process the rate of transfer of heat is maximum?

- (a) Conduction
- (b) Convection
- (c) Radiation
- (d) In all these heat is transferred with the same velocity

▼ Answer

Answer: (c) Radiation

Question 17.

Which of the following will radiate heat to large extent?

- (a) Rough surface
- (b) Polished surface
- (c) Black rough surface
- (d) Black polished surface

▼ Answer

Answer: (c) Black rough surface

Question 18.

A body cools from 60°C to 50°C in 10 minutes. If the room temperature is 25°C and assuming Newton's law of cooling to hold good, the temperature of the body at the end of the next 10 minutes will be

- (a) 38.5°C
- (b) 40°C
- (c) 42.85°C
- (d) 45°C

▼ Answer

Answer: (c) 42.85°C

Question 19.

A surface at temperature $T_0^{\circ}\text{K}$ receives power P by radiation from a small sphere at temperature $T \gg T_0$ and at a distance d . If both T and d are doubled, the power received by surface will become approximately

- (a) P
- (b) $2P$
- (c) $4P$
- (d) $16P$

▼ Answer

Answer: (c) $4P$

Question 20.

The process of heat transfer in which heat is transferred with actual migration of medium particles is known as (AFMC-94)

- (a) Conduction
- (b) Convection
- (c) Radiation
- (d) Reflection

▼ [Answer](#)

Answer: (b) Convection

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