



**GENERAL PHYSICS (1) [100ph.]**

مادة الحرررة - الاجابات 1/2 ورقة - د/محمود حسنى موسى مقلد

**HEAT**

**Answer the following questions:**

**Q1) Choose the right answer: [24 Marks]**

- The boiling point temperature of a liquid increases as:  
A. the volume of the liquid increases. **Ans: B. the external pressure increases.**  
C. the mass of the liquid decrease D. the density decrease.
- Shiny surfaces have emissivity ( $\epsilon$ ) close to:  
**Ans: A.Zero.** B. One. C. Infinity. D. two.
- The rate of heat flow by conduction per unit area per unit temperature gradient is:  
A. the coefficient of linear expansion **Ans: B. the coefficient of thermal conductivity**  
C. the coefficient of resistance. D. latent heat of fusion.
- The platinum resistance thermometer depends on the thermometric property that:  
A. the change of density with temperature  
**Ans: B. the increase of electrical resistance with temperature**  
C. the increase of conductivity with temperature  
D. the decrease of resistance with temperature.
- The quantity of heat gained by a substance is proportional to it's:  
A. Volume and the change of temperature. **Ans: B. mass and the change of temperature**  
C. Density and specific heat. D. all the previous.
- The rate of emission of radiation for a perfect black body at temperature of 127 k is...  
( $\sigma = 5.67 \times 10^{-8} \text{ watt/m}^2 \cdot \text{k}^4$ ).  
**Ans A.  $1.45 \times 10^3 \text{ W/m}^2$**  B.  $1.45 \times 10^2 \text{ W/m}^2$  C.  $5.67 \times 10^3 \text{ W/m}^2$  D.  $5.67 \times 10^4 \text{ W/m}^2$
- At 4 °C, water has:  
A. maximum volume **Ans: B. minimum volume** C. minimum density D. nothing
- The rate of heat flow by conduction through a slab does NOT depend upon the:  
**ans A. specific heat of the** slab B. thermal conductivity of the slab  
C. slab thickness D. cross-sectional area of the slab
- The latent heat of fusion of water is 80 cal/g. This means 80 cal of energy are required to:

- A. raise the temperature of 1 g of water by 1K  
C. raise the temperature of 1 g of ice by 1K

- B. convert 1 g of water to steam  
ansD. melt 1 g of ice

10. Two different metals have the same mass and temperature. Equal quantities of energy are absorbed as heat by each. Their final temperatures may be different because the samples have different .....

- A. coefficients of expansion  
ans: C. heat capacities
- B. thermal conductivities  
D. densities

11. The coefficient of linear expansion of a certain steel is  $0.000012$  per  $^{\circ}\text{C}$ . The coefficient of volume expansion, in  $(^{\circ}\text{C})^{-1}$ , is:

- A.  $(0.000012)^3$  ans:B.  $3 \times 0.000012$  C.  $0.000012$  D.  $2 \times 0.000012$

12. Possible units for the coefficient of volume expansion are:

- Ans: A.  $1/^{\circ}\text{C}$  B.  $(^{\circ}\text{C})^3$  C.  $1/(^{\circ}\text{C})^3$  D.  $\text{mm}^3/^{\circ}\text{C}$

13. Calorie/ gm. $^{\circ}\text{C}$  are the unit of:

- A. Heat capacity. Ans: B. Specific heat. C. Latent heat. D. Thermal conductivity.

14. The "triple point" of a substance is that point for which the temperature and pressure are such that:

- A. Solid and liquid are in equilibrium B. liquid and vapor are in equilibrium  
Ans:C. Solid, liquid, and vapor can coexist in equilibrium. D. All the previous.

15. The principle of Joule's method to determine the specific heat of liquids depends on..

- A. Newton cooling law ans:B. conservation law of energy  
C. Stefan law C. Seebeck effect.

16. Heat has the same units as:

- A. temperature ans:B. energy C. energy/time D. energy/volume

Q<sub>2</sub>)

A) Describe briefly the principle, construction and working of a thermoelectric thermometer?  
[5Marks]

B) Drive the formula of the rate of heat flow through a compound wall made of two materials of the same area at the steady state?  
[6Marks]

C) 50 gm of ice at  $0^{\circ}\text{C}$  is add to 200 gm of water at  $30^{\circ}\text{C}$ . What the final temperature of the mixture since the specific heat of water  $4186 \text{ J/kg}\cdot\text{c}$  and the latent heat of fusion is  $3.33 \times 10^5 \text{ J/kg}$ .  
[5Marks]

Ans ; 8.089 c

*Kind regards*