

19-07

Question 225

Liquid nitrogen boils at temperature of  $-196$  degrees Celsius when the pressure is one atmosphere. A silver coin of mass  $1.5 \times 10^{-2}$  Kg and temperature  $25$  degrees Celsius is dropped into the liquid. What mass of nitrogen boils off as the coin cools to  $-196$  degrees Celsius. [Take the specific heat of silver =  $235$  J/Kg/K and latent heat of vaporization for liquid nitrogen is  $2.0 \times 10^5$  J/Kg.

- (a) 8.10 g.
  - (b) 89.0 g.
  - (c) 20.1 g.
  - (d) 112 g.
  - (e) 3.90 g.
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Question 226

Two cubes, one silver and one iron, have the same mass and temperature. A quantity  $Q$  of heat is removed from each cube. Which one of the following causes the final temperature of the cubes to be different?

- (a) latent heat of vaporization
  - (b) density
  - (c) coefficient of volume expansion
  - (d) volume
  - (e) specific heat
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Question 227

An ice cube has a mass of  $30.0$  g and is at zero degrees-C. Calculate the amount of heat needed to convert the cube into water at  $20$  degrees-C. Latent heat of fusion of water =  $333$  kJ/kg latent heat of vaporization of water =  $2256$  kJ/kg Specific heat of water =  $4.19$  kJ/kg.K

- (a) 70.2 kJ
  - (b) 12.5 kJ
  - (c) 7.5 kJ
  - (d) 10.0 kJ
  - (e) 2.5 kJ
- 

Question 228

A  $2.00$ -kg sample of steam at  $100$  degrees-C loses  $2.26$  kJ of heat. What is the final temperature of the sample? Latent heat of vaporization of water =  $2256$  kJ/kg Latent heat of fusion of water =  $333$  kJ/kg specific heat of water =  $4.19$  kJ/kg.K

- (a) 96.2 degrees-C
  - (b) 100 degrees-C
  - (c) 94.6 degrees-C
  - (d) 86.4 degrees-C
  - (e) 99.5 degrees-C
- 

Question 229

Fifty grams of ice at zero degrees Celsius is placed in a thermos bottle containing  $100$  grams of water at  $6.0$  degrees Celsius. How many grams of ice will melt?

- (a) 2.0 grams.
  - (b) 17 grams.
  - (c) 7.5 grams.
  - (d) 3.5 grams.
  - (e) 50 grams.
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0.68-43%

Question 230

A person wants to cool 0.3-kg of water that is initially at 30 degrees Celsius by adding ice initially at -25 degrees Celsius. How much ice should he add so that the final temperature will be 0 degrees Celsius with all the ice melted? [For ice, use the specific heat =  $2.1 \times 10^3 \text{ J/(kg}\cdot\text{K)}$ , and heat of fusion =  $3.3 \times 10^5 \text{ J/kg}$ ].

- (a) 11 g.
- (b) 1.2 g.
- (c) 22 g.
- (d) 43 g.
- (e) 99 g.

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0.44-40%

Question 231

A metallic bullet, of mass  $m$  and specific heat  $c$ , hits a steel plate with a speed  $v$ . During the impact, 50% of the bullet's initial kinetic energy is converted to thermal energy in the bullet. What is the rise in temperature of the bullet?

- (a)  $v^2/(2c)$ .
- (b)  $v^2/(4c)$ .
- (c)  $v/(4c)$ .
- (d)  $v/(2c)$ .
- (e)  $v^2/c$ .

## 19-8 A Closer Look at Heat and Work

19-08

Question 232

The work done in the expansion of a gas from an initial to a final state

- (a) always equals  $P(V_f - V_i)$ .
- (b) depends only on the end points.
- (c) is the slope of a PV curve.
- (d) is the area under the curve of a PV diagram.
- (e) is negative.

19-08

0.39-58%

Question 233

One mole of an ideal gas is taken through the cyclic process ABCA as shown in Fig. (2). What is the net heat absorbed, or lost, by the gas?

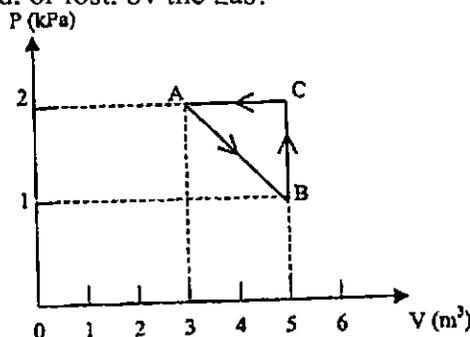


fig.(2)

- (a)  $-2.0 \times 10^3 \text{ J}$ .
- (b)  $-1.0 \times 10^3 \text{ J}$ .
- (c)  $1.0 \times 10^3 \text{ J}$ .
- (d)  $2.0 \times 10^3 \text{ J}$ .
- (e)  $5.0 \times 10^3 \text{ J}$ .