UNIT FOUR Lesson 1

MULTIPLE CHOICE QUESTIONS:

1) b	2) a	3) a	4) a	5) b
6) a	7) b	8) d	9) a	10) d
11) a	12) c	13) b	14) c	15) c
16) a	17) b	18) c	19) c	20) a
21) d	22) b	23) c		

PROBLEMS

1) $q_p = m \cdot c \cdot \Delta T = 50 \text{ X } 4.18 \text{ X } 20 = 4180$ Joules

2) $q_p = m \cdot c \cdot \Delta T$

$276 = 4.5 \text{ X } 0.13 \text{ X } \Delta T$

$$\Delta T = \frac{276}{4.5 \text{ X } 0.13} = 471.8^oC$$

$471.8 = T_2 - 25$ $\quad T_2 = 471.8 + 25 = 497^oC$

3) specific heat of water = 4180 J/kg°C = 4.18 J/g°C

For water: $q_p = m \cdot c \cdot \Delta T$

$6500 = 100 \text{ X } 4.18 \text{ X } \Delta T$

$\Delta T = 15.55^oC$ $\quad \Delta T = T_2 - T_1$ $\quad T_2 = 20 + 15.55 = 35.55^oC$

specific heat of sand = 4180 J/kg°C = 4.18 J/g°C

For sand: $q_p = m \cdot c \cdot \Delta T$

$6500 = 100 \text{ X } 0.84 \text{ X } \Delta T$

$\Delta T = 77.38^oC$ $\quad \Delta T = T_2 - T_1$ $\quad T_2 = 20 + 77.38 = 97.38^oC$

4) $\Delta T = T_2 - T_1 = 40 - 25 = 15^oC$

$q_p = m \cdot c \cdot \Delta T$

$5700 = 155 \text{ x } c \text{ x } 15$ $\quad c = 2.45$ J/g°C

5) $\Delta T = T_2 - T_1 = 28 - 15 = 13^oC$

$q_p = 100 \text{ x } 0.143 \text{ x } 13 = 185.9$ J

6) $\Delta T = T_2 - T_1 = 28\text{-}30 = -2^oC$
In dil. Sol. 1ml = 1g so the mass of the sol. Is 20 g
In dil. Sol. the specific heat = that of water (4.18 J/g^{o}C)
$q_p = m \cdot c \cdot \Delta T = 20 \times 4.18 \times -2 = -167$ J
q_p in calories = $\frac{-167.2}{4.18}$ = -40 Cal
7) The amount of heat lost from the hot amount of water (80g at 50^{o}C) = the amount of heat absorbed by the cold amount of water (250g at 10^{o}C)
$q_p = -q_p$
$m.c.\ \Delta T = -(m.c.\ \Delta T)$
Since the specific heat of water is constant so, (c) can be cancelled in both sides
$m \cdot \Delta T = - m \cdot \Delta T$
$80\ (T_2 - 50) = -250\ (T_2 - 10)$
$80T_2 - 4000 = -250T_2 + 2500$
$330T_2 = 6500$
$T_2 = 20^oC$