امتحان منتصف الفصل الدراسي الثاني 2026/2025

Midterm of Term 2 Exam 2025/2026

@physixspert

	Teacher ~~Student~~ Number
model Answer	Student Name
	School
	Class
	Stream
physics	Subject

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Marker			Total
Signature	Name	20	

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الرؤية : تعليم حكومي مبتكر وريادي يمثل نموذج يحتذى به عالمياً

Part 1 : Multiple choice questions (10 marks) (1 each)

Q1. The total energy of the molecule is called ?

a. Heat
b. Temperature
[✓ c. Thermal energy]
d. Thermal equilibrium

Q2. Which of the following statements about thermal equilibrium is false?

a. When two objects are at equilibrium, they have the same temperature.
b. The total energy flow equal to zero.
c. the rate of energy flow between the two objects is equal.
[✓ d. Heat transfer continues after reaching thermal equilibrium state.]

Q3. the boiling point of water in kelvin scale is?

a. 100 k
b. 212 k
[✓ c. 373 k]
d. -173 k

Q4. which of the following is true about converting 34 kelvin to degree Celsius ?

[✓ a. -239 °C] ✓
✗ b. 307 °C
c. 93.2 °C
d. 1.11 °C

$TK = T°C + 273$
$T°C = TK - 273$
$= 34 - 273 = -239°C$

Q5. which of the following conversions is false?

a. 0 °C = 273 k
b. 273 k= 32 °F
c. 316 k =109.4 °F
[✓ d. 240 F = -33 °C]

$TF = (T°C \times \frac{9}{5}) + 32$
$T°C = (TF - 32) \times \frac{5}{9}$

1. c
2. d
3. a
4. b
5. d

Q6. according to the specific heat of the following substances which substance will be heated up more quickly?
(aluminum =897 j/kg.k) (brass=376 j/kg.k) (silver=235 j/kg.k)
(zinc=388 j/kg.k)

Lowest specific Heat will be heated more quickly.

a. aluminum
b. brass
[✓ c. silver]
d. zinc

Q7. How much heat is needed to warm 363 g of water in a baby bottle from 24°C to 38°C? (specific heat of water=4180)

[✓ a. 21 kj]
b. 121 kj
c. 36 kj
d. 820 kj

$Q = mC\Delta T$
$= 0.363 \times 4180 \times (38 - 24)$
$= 21242.7\ J \simeq 21 \times 10^3\ J$
$= 21 kJ$

$m = 0.363\ Kg$
$T_i = 24°C$
$T_f = 38°C$
$C = 4180\ J/KgK$

Q8. which of the following is correct about two cubes of iron at the same temperature but with different masses?

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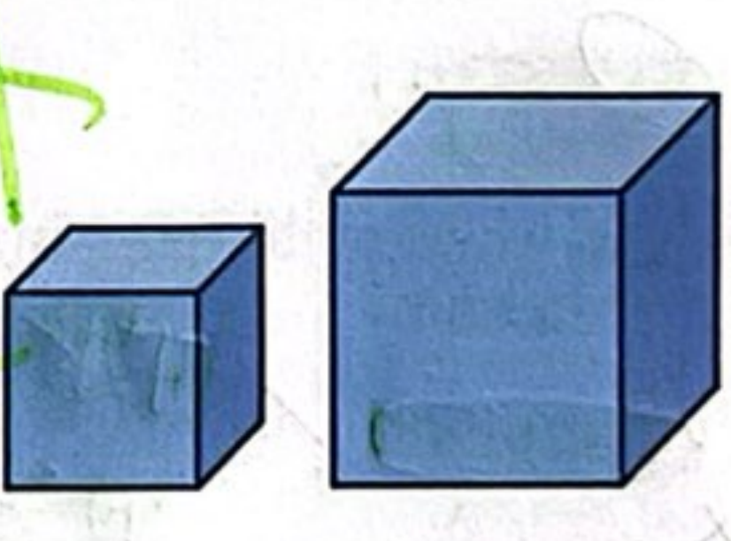

a. The larger cube has less thermal energy.
b. The smaller cube has more thermal energy .
c. The two cubes have the same thermal energy .
[✓ d. The larger cube has more thermal energy.]

~~6.~~ c
~~7.~~ a
~~8~~ d
~~9~~ c
~~10~~ d

Q9. what will happen to to the specific heat of water if the mass increased two times ?

a. The specific heat increased two times .
b. The specific heat decreased to half.
[✓ c. The specific heat remains constant.]
d. The specific heat increased four times.

Q10. which of the following is considered as a way of thermal energy transfer ?

a. Conduction
b. radiation
c. Convection
[✓ d. all of the above.]

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6. c
7. a
8. d
9. c
10. d

Part 2 : Written questions (10 marks)

Q1. (~~2.~~5 marks) $m_w = 0.1\ Kg$

A 1.50x10²g piece of glass at a temperature of 70.0°C is placed in a container with 1.00x10²g of water initially at a temperature of 16.0°C. What is the equilibrium temperature of the water?

$T_{iw} = 16°C$
$C_g = 840\ J/Kg.K$
$C_w = 4180\ J/Kg.K$

$m_g = \frac{1.5 \times 10^2}{10^3} = 0.15\ Kg$
$T_{ig} = 70°$
① $m_g C_g \Delta T_g = -m_w C_w \Delta T_w$ ①
$0.15 \times 840 \times (T_f - 70) = -0.1 (4180) (T_f - 16)$ ①
$\boxed{T_f = 28°C}$ ① ①

Q2. (~~2.~~5 marks)

A 4.00x10²g sample of water at 15.0°C is mixed with 4.00x10²g of water at 85.0°C. After the system reaches thermal equilibrium, 4.00x10²g of methanol at 15°C is added. Assume there is no thermal energy lost to the surroundings. What is the final temperature of the mixture?

$Q_1 = -Q_2$
$m_1 C_1 \Delta T_1 = -m_1 C \Delta T_1$ ①
$0.4 \times 4180 \times (T_f - 15) = 0.4 \times 4180 \times (T_f - 85)$ ①
$T_f = 50°C$ ①
$m_w C_w \Delta T_w = -m_m C_m \Delta T_m$
$0.8 \times 4180 \times (T_f - 50) = -0.4 \times 2450 \times (T_f - 15)$ ①
$T_f = 42°C$ ①

$C_w = 4180\ J/KgK$
$C_m = 2450\ J/KgK$
$m_1 = 0.4\ Kg$
$m_2 = 0.4\ Kg$
$T_1 = 15°C$
$T_2 = 85°C$
$m_m = 0.4\ Kg$
$T_{im} = 15°C$

Q3. (~~2.~~5 marks)

Conduction:The hard tile floor of a bathroom always feels cold to bare feet even though the rest of the room is warm. Is the floor colder than the rest of the room? Explain.

No, but the bathroom floor has a lower specific Heat, that's why The thermal Heat transfer from bare feet to the bathroom floor. that's why you feel it is Colder.

Q4. (~~2.~~5 marks)

A calorimeter contains 0.50 kg of water at 15°C. A 0.10 kg block of an unknown substance at 62°C is placed in the water. The final temperature of the system is 16°C. What is the substance?

specific Heat

$C = ?$
$m_w = 0.5\ Kg$
$T_i = 15°C$
$m_s = 0.1\ Kg$
$T_i = 62°C$
$T_f = 16°C$

$Q_w = -Q_s$ ①
$m_w C_w \Delta T_w = -m_s C_s \Delta T_s$ ①
$0.5 \times 4180 \times (16 - 15) = -0.1\ C_s (16 - 62)$ ①
$2090 = -0.1 (16 - 62) C_s$
$C_s = 454.3\ J/kg.K$
① ①

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