

**Part One: Each question deserves one mark.****Choose the correct answer form the given options and write on the space provided.**

1. One of the following best describes the relationship between two systems at thermal equilibrium.
 - A. The volumes of the systems must be equal
 - B. The masses of the system must be equal
 - C. Their net energy exchange must be zero.
 - D. The velocities of the fundamental particle must be zero.
2. The transfer of heat by the actual movement of the molecules f the medium refers to
 - A. Radiation
 - B. Conduction
 - C. Convection
 - D. B and C
3. Which of the following is not true statement
 - A. Heat energy is the molecular kinetic energy possessed by its fundamental particles due to its random motion
 - B. Liquids boil when vapour pressure and external pressure are equal
 - C. Heat energy is said to be librateal as it changes from solid to liquid.
 - D. During latent heat of fusion heat is absorbed.

Use the following figure to answer the next for questions consider the liquid through the pipe is water.
(10^3kg/m^3)

4. The volume flow rate through the ends is ____ m^3/s
 - A. 1.6×10^{-2}
 - B. 16×10^2
 - C. 4×10^{-4}
 - D. 16
5. The value of V_2 is _____ m/s
 - A. 10
 - B. 20
 - C. 30
 - D. 40
6. If he second end is open to air at the standard atmospheric pressure ($1.01 \times 10^5 \text{ pa}$). What is the pressure that force the water through pipe (P_1) ?
 - A. $5.4 \times 10^5 \text{ Pa}$
 - B. $5.8 \times 10^5 \text{ Pa}$
 - C. $8.91 \times 10^5 \text{ Pa}$
 - D. $1.12 \times 10^6 \text{ Pa}$

7. What is the rate at which energy is transferred at the end one
 A. 656 ω B. 14256 ω C. 65.6 D. 441 ω
8. Strictly speaking, which of the following is different from the other
 A. Laminar flow B. streamlines flow C. Turbulent flow D. steady flow
9. Which of the following is not true of Bernoulli's principle?
 A. Bernoulli's principle is true at any arbitrary point along a stream lines.
 B. Total pressure is constant along a stream lines.
 C. It is based on the law of conservation of energy
 D. The mass out flow rate at the larger diameter end is greater than the mass inflow rate at the smaller diameter
10. The pressure exerted to a confined liquid is equally transmitted undiminishedly in all directions throughout the liquid this statement is referred to
 A. Bernoulli's principle B. Pascal's law C. Stoke's law D. Archimedes's principle
11. A bullet of mass 800g is fired horizontally with a velocity of 320 m/s into a sand bag and comes out on the other end with 10% of its initial velocity. If the change in temperature while it is through is, assumed to heat, what is the change in the temperatures of the bullet?
 $C_{\text{bullet}} = 800 \text{ J/kg K}$
 A. 51.84 K B. 640 K C. 33177.6 K D. 57.6 K
12. Which of the following is not true of the factors affecting the aerodynamics lift of the plane flying horizontally?
 A. Speed of the plane C. area of the wing
 B. The curvature of the wing D. all are true
13. Which one of the following do you think has more burning effect than the others?
 A. 1g water at 0°C B. 1g ice at 0°C C. 1g steam at 100°C D. 1g water /liquid/ at 100°C
14. What quantity of heat must be given out by 2 kg steam at its boiling point to a 2 kg water at 100°C ?
 $(L_v = 2.3 \times 10^6 \text{ J/kg})$
 A. $4.6 \times 10^6 \text{ J/kg}$ B. $1.15 \times 10^6 \text{ J/kg}$ C. $6.4 \times 10^6 \text{ J/kg}$ D. $64 \times 10^6 \text{ J/kg}$
15. The transfer of heat energy by convection does occur in
 A. Liquid B. Solid C. Gas D. Vacuum E. B and D
16. Which of the following is not true of radiation?
 A. All objects continuously radiate energy in the form of electromagnetic wave
 B. All surfaces are equal absorbing and radiating capacity
 C. Solar energy is received by radiation

D. The rate at which an object emits radiant energy is proportional to the four power of its absolute temperature.

17. The quantity of heat given out by a 1 kg of a substance without changing of its temperatures at melting point is
A. Latent Heat of fusion C. Latent Heat of condensation
B. Latent Heat of vaporization D. Latent Heat of solidification
18. One of the following is defined as the measure of the average molecular kinetic energy.
A. Heat capacity B. Heat intensity C. Temperature D. Specific heat capacity
19. What must be the rate of heat flow through a silver slab of area 6cm^2 and length 0.8m ? assume that the temperature difference between its ends is maintained at 40°C and the thermal conductivity of H_2 silver is 414 W/mK
A. 1.25 J/s B. 12.42 J/s C. 124.2 J/s D. 1242 J/s
20. _____ is a measure of the ability of a body to resist change in volume as pressure is exerted from all direction?
A. Shear modulus B. young modulus
C. Bulk modulus D. stress

Part II. One mark each

Fill the blank space given below with appropriate terms.

1. The point at which the vapor pressure of a water is equal to the pressure of the gas above it is called _____
2. The quantity of heat required to change the unit mass of a substance from solid to liquid at the melting point is known as _____
3. _____ is a perfect emitter and absorbed of all radiations
4. _____ is the movement of liquid molecules along the solid surfaces due to adhesive force.
5. Any object placed in a fluid experiences _____ force.

Part III. One mark each

Answer the following questions by writing 'True' or 'False' on the space provided.

1. As the speed of a fluid increases the pressure it exerts increase.
2. Bernoulli's principle is the result of conservation of energy.
3. Heat is transferred from a body of low temperature to a body of high temperature.
4. Warming a liquid can increase its surface tension.
5. Laminar flow can change to turbulent flow as the speed of the flow increase.

IV. Solve the following two questions. Show your steps clearly and neatly so you deserve the marks.

(5 marks each.)

1. Find the total heat energy that used to convert 3kg ice at -10°C to 3kg steam at 110°C at standard atmospheric pressure.
 $C_p = 4200 \text{ J/kg K}$
 $C_{\text{ice}} = 2100 \text{ J/kg K}$
 $C_{\text{steam}} = 2.08 \times 10^3 \text{ J/kg K}$
 $L_f = 3.4 \times 10^5 \text{ J/kg K}$
 $L_v = 2.3 \times 10^6 \text{ J/kg K}$

2. A block has a density of $3 \times 10^3 \text{ kg/m}^3$ and weights of 1.8N in air. When the block is completely submerged in a liquid, it weight 1.2N when it immerses in the liquid. What is the density of the liquid?

ANSWER SHEET

NAME _____ SECTION _____ ROLL NO _____

1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	