1. Pistons of Diesel engines are usually cooled by

(a) Air

(b) Water

(c) Lubricating oil (Ans)

(d) Fuel oil

2. When a hydrocarbon fuel burns in excess air, Orsat analysis of products of combustion will show

(a) CO, CO_2 and N_2 (Ans)

(b) CO_2, CO, N_2 and H_2O

(c) CO_2, N_2, O_2 and H_2O

(d) CO_2, N_2 and O_2

3. What will be the products of combustion shown by an Orsat analyzer when natural gas burns in deficit air ?

(a) CO_2, O_2 and N_2

(b) CO_2, CO and N_2 (Ans)

(c) CO_2, CO, N_2 and H_2O

(d) CO_2, CO, N_2 and O_2

4. The energy produced by 4.5 tons of high grade coal is equivalent to the energy produced by

(a) 1 kg of Uranium

(b) 1 gram of Uranium (Ans)

(c) 100 grams of Uranium

(d) 10 grams of Uranium

5. Enriched Uranium is one in which

(a) Percentage of U235 has been artificially increased (Ans)

(b) Percentage of U238 has been artificially increased

(c) Percentage of U234 has been artificially increased

(d) Extra energy is pumped from outside

6. Which one o the following statements is not correct ?

(a) Fusion is the combination of heavy nuclei of elements resulting in the release of heat energy (Ans)

(b) Neutron bombardment is the most common and practiced method of initiation of reaction in fission materials

(c) When the multiplication factor is greater than 1, the chain reaction is uncontrollable

(d) The reactor produces a, β, g and neutron radiations. Of all these g radiation is the most dangerous

7. The reflectivity in a reactor depends upon

(a) Geometry of the reflector

(b) Energy of neutrons

(c) Properties of reflector

(d) All of these (Ans)

8. Shielding in a nuclear power plant is done

(a) To protect against neutron and gamma rays (Ans)

(b) To absorb excess neutrons

(c) To slow down the speed of fast moving neutrons

(d) To return the neutrons back into the core of the reactor

9. This substance has the minimum value of thermal conductivity

(a) Air (Ans)

(b) Water

(c) Plastic

(d) Rubber

10. Dimensionless number is represented by

(a) Biot number

(b) Fourier number (Ans)

(c) Euler number

(d) Gratez number

11. If the radius of any current carrying conductor is less than the critical radius, then the addition of electrical insulation will enable the wire to carry a higher current because

(a) The heat loss from the wire would decrease

(b) The heat loss from the wire would increase (Ans)

(c) The thermal resistance of the insulation is reduced

(d) The thermal resistance of the conductor is increased

12. Match List-I with List - II and select the correct answer using the code given below the lists:

List - I List – I

(A) Number of Transfer Units 1. Regenerators

(B) Periodic flow heat exchangers 2. Fouling factor

(C) Phase change 3. A measure of heat exchanger size

(D) Deposition on heat exchanger 4. Condensers

Codes :

(A) (B) (C) (D)

(a) 3 4 1 2

(b) 2 4 1 3

(c) 3 1 4 2 (Ans)

(d) 2 1 4 3

13. Floating heads are provided in heat exchangers to

(a) Accumulate vapours released

(b) Decrease pressure drop

(c) Regulate the flow (Ans)

(d) Avoid deformation of tubes due to thermal expansion

14. If the thermal conductivity of a material of wall varies as K0 (1 + at) then the temperature at the centre of the wall as compared to that n case of constant thermal conductivity will be

(a) More (Ans)

(b) Less

(c) Same

(d) Possible in all as above

15. Match List-I with List - II and select the correct answer using the code given below the lists:

List - I List - I

(A) Stanton number 1. Natural convection

(B) Grashof number 2. Mass transfer

(C) Peclet number 3. Forced convection

(D) Schmidt number 4. Forced convection for small Pr.Number

Codes :

(A) (B) (C) (D)

(a) 2 1 4 3

(b) 3 1 4 2 (Ans)

(c) 2 4 1 3

(d) 3 4 1 2

16. In the film established along a vertical plate during condensation of any vapour over the plates, the temperature distribution curve is

(a) Concave upwards (Ans)

(b) Concave downwards

(c) Parabolic

(d) Straight line

17. In spite of large heat transfer coefficients in boiling liquids, cavities are used advantageously when the entire surface is exposed to

(a) Nucleate boiling

(b) Film boiling (Ans)

(c) Transition boiling

(d) Pool boiling

18. For a fluid flowing over a flat plate, the Nusselt number at a point 1.25 m from the leading edge is 100. If the thermal conductivity of the fluid is 0.025 W/mK, the coefficient of convective heat transfer is

(a) 2000 W/m2 K

(b) 2 W/m2 K (Ans)

(c) 5 * 10-4 W/m2 K

(d) 1.25 * 10-4 W/m2 K

19. The unit of the following parameter is not m2/s :

(a) Thermal diffusivity

(b) Kinematic viscosity

(c) Mass diffusivity

(d) Dynamic viscosity (Ans)

20. Ice is very close to a

(a) Gray body (Ans)

(b) Black body

(c) White body

(d) Specular body

21. In a refrigeration plant, if the condenser temperature increase, the power input to the compressor will

(a) Increase (Ans)

(b) Decrease

(c) Remain the same

(d) Be unpredictable

22. In gas cycle refrigeration system, an expander replaces the throttle valve of a vapour compression system, because

(a) The pressure drop obtained is not adequate

(b) The drop in temperature by throttling the gas is very small (Ans)

(c) It reduces the irreversibility in the system

(d) Heat loss is significantly decreased with the expander

23. In an aircraft refrigeration system, the pressure at the cooling turbine outlet is equal to

(a) Ambient pressure

(b) Cabin pressure (Ans)

(c) Compressor inlet pressure

(d) Evaporator pressure

24. A condenser of a refrigeration system rejects heat at a rate of 120 kW, while the compressor of the system consumes a power of 30 kW. The COP of the system will be

(a) 1/4

(b) 1/3

(c) 3 (Ans)

(d) 4

25. Which of the following is not an essential component of refrigeration system, where refrigeration effect is produced by vaporization of refrigerant ?

(a) Compressor

(b) Condenser

(c) Evaporator

(d) Expansion device (Ans)

26. If the specific humidity of moist air remains the same but its dry bulb temperatures increases, its dew point temperature

(a) Remains the same (Ans)

(b) Increases

(c) Decreases

(d) May increase or decrease depending on its relative humidity

27. In an adiabatic saturation process of air

(a) The enthalpy remains constant (Ans)

(b) The temperature remains constant

(c) The absolute humidity remains constant

(d) The relative humidity remains constant

28. If air flows over a cooling coil, dehumidification of air will take place if the coil surface temperature is below the following of the entering air

(a) Wet bulb temperature

(b) Dry bulb temperature

(c) Dew point temperature (Ans)

(d) Adiabatic saturation temperature

29. In winter air-conditioning, the process is

(a) Heating, humidification and cooling

(b) Heating, humidification and heating (Ans)

(c) Heating, dehumidification and heating

(d) Cooling, dehumidification and heating

30. For a given dry bulb temperature, as the relative humidity decreases, the wet bulb temperature will

(a) Increase

(b) Decrease (Ans)

(c) Be the same

(d) Depend on other factors