B. E. Chemical Part I (Sem- VII)

Chemical Process Design (MCQs)

1) Which may not be the part of P & I diagram ---
   a) Process Equipment
   b) Off site facilities
   c) Instruments
   d) Piping

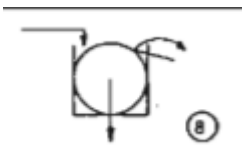
2) Locally mounted means controller and display are located in the ---
   a) Control Room
   b) Utillity section
   c) Safety office
   d) Field

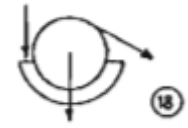
3) QRC is recording controller for ---
   a) Quality
   b) Quantity
   c) Quantum
   d) Quite

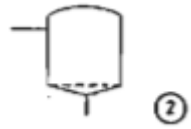
4) NRE is used to prevent ---- of fluid in pipe line
   a) Flow
   b) Pressure
   c) Back flow
   d) Velocity

5) In a double pipe (concentric) heat exchanger, the hydraulic radius for heat transfer (for a fluid flowing through the annulus) would be
   a) Same as that for fluid flow
   b) Less than that for fluid flow
   c) More than that for fluid flow
   d) D_2 - D_1 (D_1 and D_2 are I.D. of inner and outer pipes respt.)

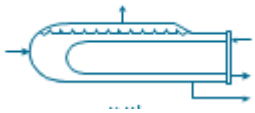
6) _____is not a symbol of rotary vacuum filter.
   a) 

b) 

c) 

d) 

7) The following symbol represents _____.



a. Double Pipe Heat Exchanger
b. Kettle type Heat Exchanger
c. Condenser
d. None of these

8) Identify the Butterfly Valve____

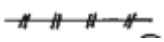
a. 

b. 

c. 

d. None of the above

9) The following symbol represent_____



a. Electrical Line
b. Capillary Line
c. Pneumatic Line
d. None of the above

10) Discharge of a centrifugal pump is proportional to .....

A. Impeller diameter(D)
B. D^2
C. D^3
D. $1/D^3$

11) Installing larger diameter pipe in pumping system results in reduction in
a. Static head
c. Both a and b
b. Frictional head
d. None of the above

12) For small discharge at high-pressure following pump is preferred .....

A. Centrifugal
B. Axial flow
C. Propeller
D. Reciprocating

13) Which of the following is not a rotary pump .....

A. Gear
B. Vane
C. Screw
D. Axial

14) Cornell's Equation is,

a. $H_G = 0.011\ \psi_h\ (Sc)_v^{0.5} \left(\frac{Dc}{0.305}\right)^{1.11} \left(\frac{Z}{3.05}\right)^{0.33} / (L_w^*\ f_1\ f_2\ f_3)^{0.5}$

b. $H_G = 0.011\ \psi_h\ (Sc)_v^{0.5} \left(\frac{Dc}{0.305}\right)^{1.11} \left(\frac{Z}{3.05}\right)^{0.33} / (L_w^*\ f_1\ f_2\ f_3)$

c. $H_G = 0.011\ \psi_h\ (Sc)_v \left(\frac{Dc}{0.305}\right)^{1.11} \left(\frac{Z}{3.05}\right)^{0.33} / (L_w^*\ f_1\ f_2\ f_3)^{0.5}$

d. $H_G = 0.011\ \psi_h\ (Sc)_v \left(\frac{Dc}{0.305}\right)^{1.11} \left(\frac{Z}{3.05}\right)^{0.33} / (L_w^*\ f_1\ f_2\ f_3)$

15) Percentage flooding =

a. $\left[\frac{K4\ at\ design\ pressure\ drop}{K4\ at\ flooding}\right]^{0.5}$

b. $\left[\frac{K4\ at\ design\ pressure\ drop}{K4\ at\ flooding}\right]$

c. $\left[\frac{K4\ at\ flooding}{K4\ at\ design\ pressure\ drop}\right]^{0.5}$

d. None of the above

16) Which method can be used to Design of distillation column?
a. Onda's method
b. Cornell's method
c. Both

d. None of the these

17) In a double pipe heat exchanger, in the inner side fluid enters at 20℃ and leaves at 45℃. The annulus has steam condensing at 1atm. What is the value of LMTD?
a) 39℃
b) 66.7℃
c) 70℃
d) 40.5℃

18) Consider we have a Double pipe Heat Exchanger, with inner tube of diameter 20mm (neglect thickness) and outer tube of diameter 30mm. We have two fluids A & B (K_A = 15W/mK and K_B = 20W/mK) we desire to have their flow rates as $15m^3/s$ and $21m^3/s$ respectively. If their Nusselt number after calculation is Nu_i = 429 and Nu_o = 530. What is the overall heat transfer coefficient of the equipment is no fouling exists?

a) 168.4 W/m^2K
b) 168.4×10^3 KW/m^2K
c) 188.4 W/m^2K
d) 168.4 KW/m^2K

19) Which of the following is not a subset of the category of Tubular Heat Exchangers?
a) Double pipe
b) Finned pipe
c) Shell and Tube
d) Spiral tube

20) In a double pipe concentric heat exchanger, the equivalent diameter of annulus for heat transfer would be
a. $D_2^2 - D_1^2 / D_1$
b. $D_2 - D_1$
c. $D_2^2 - D_1^2 / D_2$
d. None of these

21) Which is the major mean of heat transfer in a Double Pipe heat exchanger?
a) Convection
b) Conduction
c) Radiation
d) Combined Convection and Conduction

22) Fouling factor must be included in the calculation of overall design heat transfer coefficient, when the liquid
a. containing suspended solids flows at low velocity.
b. containing suspended solids flows at high velocity.
c. is highly viscous.
d. is of high specific gravity.

23) Which of the following has the maximum Log mean temperature difference for a Double Pipe Heat Exchanger?
a) Counter-flow
b) Parallel Flow
c) Cross Flow
d) Split Flow

24) Hydraulic gradient line (H.G.L.) represents the sum of .....

A. Pressure head and kinetic head
B. Kinetic head and datum head
C. Pressure head and datum head
D. Pressure head, kinetic head and datum head

25) The density of the fluids, its viscosity and the thermal conductivity (K) is measured at _____
a) LMTD
b) Mean temperature
c) Median of the temperature
d) Square mean of the temperature

26) The pressure drop required across a control valve will be a function of -----
a) Pressure in line
b) Valve design
c) Density of flowing material
d) Viscosity of flowing material

27) If T_1= 390°F, T_2= 200°F, t_1=100°F, t_2= 170°F then R =____, S =____

a) 2.70, 0.245 b) 2.75, 0.241 c) 2.71, 0.241 d) 2.71, 0.245

28) If T_1= 390°F, T_2= 200°F, t_1=100°F, t_2= 170°F Then LMTP (Counter Current) =_____°F

a) 152.8°F b) 153.3°F c) 151.2 °F d) 152.2°F

29) IF W=12400 lb/hr, λ= 961 Btu/lb, U= 250 Btu/hr.ft^2. $°F$,

T_1= 224 $°F$ T_2=194$°F$ then area 'A' = _____

a) $1585ft^2$ b)$1595ft^2$ c) $1580ft^2$ d) $1590ft^2$

30) lb of water evaporated divided by lb of steam is called as _____ economy.

a) Water b) Steam c) Process d) Evaporator

31) The shortest distance between two adjacent tube holes is called as

a) Square pitch b) Gap between the tubes

c) Clearance d) Pitch

32) Which is not the essential constituent of streams in the flow sheet

a) Temperature b) Flow rates

c) Physical Properties d) Compositions

33) Computer aided flow sheeting are capable of producing_____ .

a) Accurate and detailed material balance

b) Preliminary equipment design

c) Rigorous simulator heat & material balance

d) All the above

34) ISO means in coding system_____.

a) International Standardization Organization

b) Organization of International Standards

c) International Organization of Standard

d) International organization for standardization

35) Standered Inlet velocity of dust, laiden gas in cyclone separator is_____

a. 5 to 25 m/s
b. 6 to 26 m/s
c. 7 to 27 m/s
d. 9 to 27 m/s

36) If Dc = 420 mm, then Cyclone inlet duct area is _____mm^2.

a. 17500
b. 17600
c. 17540
d. 17640

37) At Reynolds's No. = 167. Find the value of j^H =

a. 120
b. 167
c. 267
d. 67

38) Find the specific heat of Benzene at T_{avg} = 100 ^{0}F.

a. 0.425 Btu / (lb)(^{0}F)
b. 0.665 Btu / (lb)(^{0}F)
c. 0.113 Btu / (lb)(^{0}F)
d. 0.005 Btu / (lb)(^{0}F)

39) If fc = 0.005, As = 2.218 x 10^6 mm^2, A1 = 16800 mm^2, then ψ = ____.

a. 0.55
b. 0.60
c. 0.66
d. 0.77

40) In a reactor if E = 19 x 10^7 Kg/mm^2 , t = 6.045 mm, Do = 8368 mm, L = 10570 mm.

Then critical buckling pressure is _____ and allowable pressure is_____.

a. 0.0540 Kg/cm^2 , 0.0136 Kg/cm^2
b. 0.1540 Kg/cm^2 , 0.1136 Kg/cm^2
c. 0.4540 Kg/cm^2 , 0.4136 Kg/cm^2
d. 0.0040 Kg/cm^2 , 0.0036 Kg/cm^2
