www.recruitment.guru

**A**
**SET**

**Booklet No. :**

# CH - 16

# Chemical Engineering

**Duration of Test : 2 Hours** **Max. Marks : 120**

**Hall Ticket No.** | | | | | | | | |

**Name of the Candidate :** _____

**Date of Examination :** _____ **OMR Answer Sheet No. :** _____

_____ _____

**Signature of the Candidate** **Signature of the Invigilator**

## INSTRUCTIONS

1. This Question Booklet consists of **120** multiple choice objective type questions to be answered in **120** minutes.
2. Every question in this booklet has 4 choices marked (A), (B), (C) and (D) for its answer.
3. Each question carries **one** mark. There are no negative marks for wrong answers.
4. This Booklet consists of **16** pages. Any discrepancy or any defect is found, the same may be informed to the Invigilator for replacement of Booklet.
5. Answer all the questions on the OMR Answer Sheet using **Blue/Black ball point pen only.**
6. Before answering the questions on the OMR Answer Sheet, please read the instructions printed on the OMR sheet carefully.
7. OMR Answer Sheet should be handed over to the Invigilator before leaving the Examination Hall.
8. Calculators, Pagers, Mobile Phones, etc., are not allowed into the Examination Hall.
9. No part of the Booklet should be detached under any circumstances.
10. The seal of the Booklet should be opened only after signal/bell is given.

**CH-16-A**

www.recruitment.guru

## CHEMICAL ENGINEERING (CH)

**1.** If the eigen values of a matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ are 0 and 3 then the third eigen value is

(A) 1 (B) 3
(C) 0 (D) 15

**2.** The rank of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 5 & 8 \\ -3 & 4 & 4 \end{bmatrix}$ is

(A) 1 (B) 3
(C) 2 (D) 0

**3.** The gradient of a function $\phi(x, y, z) = xy + yz + zx$ at the point $(1,2,0)$ is

(A) $2i + j + 2k$ (B) $i - 2j + k$
(C) $i + 2j + 2k$ (D) $2i + k$

**4.** If $\phi_1 = 0$ and $\phi_2 = 0$ are scalar functions then the angle between $\phi_1$ and $\phi_2$ is

(A) $\cos^{-1} \frac{\nabla\phi_1 - \nabla\phi_2}{|\nabla\phi_1| . |\nabla\phi_2|}$ (B) $\tan^{-1} \frac{\nabla\phi_1 + \nabla\phi_2}{1 + \nabla\phi_1 . \nabla\phi_2}$
(C) $\nabla\phi_1 . \nabla\phi_2$ (D) $\sin^{-1} \nabla\phi_1 . \nabla\phi_2$

**5.** The value of $\oint_C (x^2 - y^2 + 2ixy)dz$, where C is the contour $|z| = 1$ is

(A) 0 (B) $2\pi i$
(C) $\pi$ (D) $-\pi i$

**6.** The integrating factor of the differential equation $\frac{dx}{dy} + \frac{3}{y}x = \frac{1}{y^2}$

(A) $e^{\log y}$ (B) $e^{y^3}$
(C) $y^3$ (D) $y$

**7.** The Laplace transform of $\sinh 2x$ is

(A) $\frac{2}{s^2 + 4}$ (B) $\frac{2}{s^2 - 4}$
(C) $\frac{2}{s^2 + 2}$ (D) $\frac{2}{s^2 - 2}$

**8.** If $f(x)=x+x^2$ satisfy Lagrange Mean Value theorem in $[0,2]$ at c, then

(A) c = 0 (B) c = 3

(C) c = 1 (D) c = 2

**9.** The function $f(x,y)=xy+(\frac{1}{x}+\frac{1}{y})$ is minimum at the point

(A) (1,1) (B) (0,1)

(C) (1,2) (D) (0,0)

**10.** If $y(x_i)=y_i, i=0,1,2,3$ and $h$ the step size then by Simpson 1/3rd rule $\int_{x_0}^{x_3} y(x)\,dx$

(A) $\frac{h}{2}[y_0+2y_1+2y_2+y_3]$ (B) $\frac{h}{3}[y_0+2y_1+2y_2+y_3]$

(C) $\frac{h}{2}[y_0+4y_1+2y_2+y_3]$ (D) $\frac{h}{3}[y_0+4y_1+2y_2+y_3]$

**11.** According to Hydrostatic equilibrium, the pressure in a static fluid depends on

(A) Location in cross-section (B) Location in cross-section and elevation

(C) Elevation only (D) None of the above

**12.** The term that is not a part of Bernoulli's equation is

(A) Enthalpy (B) Pressure

(C) Elevation (D) Velocity

**13.** The pressure difference of a process fluid shown by a U tube manometer is a function of

(A) Height of process fluid in the left arm

(B) Height of process fluid in the right arm

(C) Height of manometric fluid in left arm

(D) Height difference of manometric fluid in both arms.

**14.** For a Pseudo-plastic fluid, which is true ?

(A) viscosity decreases with time (B) viscosity increases with time

(C) viscosity increases with shear rate (D) viscosity decreases with shear rate

**15.** For a laminar flow of a fluid in a tube ($N_{Re}$=1000), the fanning friction factor is

(A) 0.16 (B) 0.016

(C) 1.6 (D) 16

**16.** The dimensions of dynamic viscosity are

(A) $ML^{-1}T^{-1}$ (B) $M^{-1}L^{-1}T^{-1}$

(C) $ML^{2}T^{-1}$ (D) $MLT^{-2}$

17. The frictional loss in an unseparated boundary layer is called
(A) Form Friction (B) Pressure Friction
(C) Dynamic Friction (D) Skin Friction

18. The pressure drop in a packed bed
(A) Navier Stokes equation (B) Euler's Equation
(C) Ergun Equation (D) Bernoulli's equation

19. The velocity profile of a laminar flow of a Newtonian fluid in a tube is
(A) Linear (B) Parabolic (C) Hyperbolic (D) Sinusoidal

20. To avoid cavitation in a pump, the main principle to be applied is
(A) Maintain NPSH (B) Do Priming
(C) Do Cleaning (D) Apply lubricant

21. Head developed by a centrifugal pump is proportional to impeller speed "n" as
(A) n (B) $n^2$
(C) $n^3$ (D) $n^{-1}$

22. The drag coefficient for the flow a past sphere in stokes law regime is given by
(A) $16/N_{Re,p}$ (B) $N_{Re,p}/16$
(C) $24/N_{Re,p}$ (D) $N_{Re,p}/24$

23. The skin friction loss along the flow of 10 m of the pipe (100 mm diameter) at a velocity of 10m/s is (given fanning friction factor is 0.001)
(A) 20 J/kg (B) 5 J/kg
(C) 40 J/kg (D) 10 J/kg

24. Among the flow devices, the linear one is
(A) Venturimeter (B) Nozzle meter
(C) Orificemeter (D) Rotameter

25. For an ideal screen
(A) the smallest in overflow is slightly larger than the largest in the underflow
(B) the smallest in overflow is very much larger than the largest in the underflow
(C) the smallest in overflow is slightly smaller than the largest in the underflow
(D) the smallest in overflow is very much smaller than the largest in the underflow

**26.** The collection efficiency in a cyclone increases with

(A) decrease in particle density (B) decrease in viscosity of gas

(C) increase in viscosity of gas (D) increase in temperature of gas

**27.** For a particle dropped inside a stagnant fluid, the force that shall not act is

(A) weight of particle (B) drag force

(C) centrifugal force (D) buoyant force

**28.** According to which law of crushing, the work required is constant for same size ratio ?

(A) Rittingers Law (B) Bonds Law

(C) Kicks Law (D) Newton's Law

**29.** To avoid centrifuging in a ball mill, the operating speed should be

(A) Slightly less than critical speed

(B) Very much less than critical speed

(C) Slightly greater than critical speed

(D) Very much larger than critical speed

**30.** The fluid that shows time dependent rheology is

(A) Thixotropic Fluid (B) Pseudo plastic Fluid

(C) Dilatant Fluid (D) Binghamplastic Fluid

**31.** The mode of heat transfer in which Fouriers Law is applicable is

(A) Conduction (B) Forced Convection

(C) Radiation (D) Free Convection

**32.** The units of heat transfer coefficient is

(A) W/m.K (B) $W/m^2K$

(C) J/m.K (D) $J/m^2K$

**33.** In a pool boiling phenomenon, the preferred regime is

(A) Transition Boiling (B) Radiative Boiling

(C) Film Boiling (D) Nucleate Boiling

**34.** The convective heat flux in SI units through a medium of heat transfer coefficient 100 units (SI) with a temperature difference of 50 °C is

(A) 5000 (B) 2

(C) 0.5 (D) 500

35. The dimensionless group that gives the ratio of thermal to hydrodynamic boundary layer thicknesses is
(A) Nusselt Number (B) Prandtl Number
(C) Reynolds Number (D) Grashoff Number

36. The emissivity of a black body is
(A) 1 (B) >1
(C) 0 (D) <1

37. According to Stefan Boltzmann law, the emissive power of black body is proportional to
(A) T (B) $T^2$
(C) $T^3$ (D) $T^4$, where T is absolute temperature

38. The economy of an evaporator is defined as
(A) Steam consumed/hr
(B) Water evaporated/hr
(C) Steam consumed/water evaporated
(D) Water evaporated/steam consumed

39. In general, the major resistance in film type condensation is
(A) Liquid side (B) Vapor side
(C) Wall side (D) Fouling

40. The product of Grashoff and Reynolds number is called
(A) Prandtl Number (B) Peclet Number
(C) Rayleigh's Number (D) Nusselt Number

41. Overall thermal resistance in a heat exchanger is proportional to
(A) Overall heat transfer coefficient
(B) Reciprocal of overall heat transfer coefficient
(C) Overall temperature drop
(D) Temperature difference across the wall

42. In a closed system, which is true ?
(A) Only energy exchange
(B) Only mass exchange
(C) Neither mass nor energy exchange
(D) Both mass and energy exchange

43. According to Kelvin Planck statement of second law, if in a heat engine heat taken from source is 100 units, then
(A) Heat delivered to sink should be 100 units
(B) Work done should be 100 units
(C) Work done cannot be 100 units
(D) Heat delivered to sink cannot be 100 units

44. If in a piston cylinder assembly, a gas does 40 J work by taking 100 J heat, then the change in its internal energy is
(A) 140 J (B) –60 J
(C) –140 J (D) +60 J

45. An isentropic process is
(A) Reversible (B) Adiabatic
(C) Reversible Adiabatic (D) Reversible Isothermal

46. In a compressible cake
(A) Cake resistance is function of time.
(B) Cake resistance is function of position and time.
(C) Cake resistance is not function of time.
(D) Cake resistance is not function of position.

47. Partial molar Gibbs free energy is also called
(A) Enthalpy (B) Fugacity
(C) Chemical Potential (D) Entropy

48. The number of degrees of freedom to define the system of water and toluene (immiscible) in contact with its vapors is
(A) 1 (B) 2
(C) 3 (D) 4

49. For a steady flow through an adiabatic compressor (neglecting kinetic and potential energy changes), the work done on it is equal to
(A) 0 (B) $\Delta U$
(C) $\Delta H$ (D) $\Delta S$

50. Which is true according to principle of increase of entropy ?
(A) $\Delta S$ system>0 (B) $\Delta S$ surroundings>0
(C) $\Delta S$ system>=0 (D) $\Delta S$ universe>=0

51. Which is not a VLE model ?
(A) Raoults Law (B) Hess Law
(C) Modified Raoults Law (D) Henry's Law

52. Which of the combinations indicate Bubble point calculation ?

i. Calculate yi and T given x and P
ii. Calculate xi and T given y and P
iii. Calculate yi and P given x and T
iv. Calculate xi and P given y and T

(A) i and ii (B) ii and iii
(C) i and iii (D) i and iv

53. Enthalpy change of mixing ideal gases would be

(A) 0 (B) Positive
(C) Negative (D) Can't say

54. Internal energy of a two phase mixture with 40% quality is (internal energy values are 200 kJ/kg and 1200 kJ/kg for saturated liquid and vapor respectively).

(A) 1400 kJ/kg (B) 700 kJ/kg
(C) 600 kJ/kg (D) 1000 kJ/kg

55. Which thermodynamic function is called as Generating function ?

(A) Enthalpy (B) Internal Energy
(C) Entropy (D) Gibbs Free Energy

56. For water gas shift reaction, $CO(g) + H_2O(g) \rightarrow CO_2(g) + H_2(g)$, (all species are ideal gases), if the extent of reaction is 0.5 at 10 bar pressure, the extent at 20 bar pressure would be

(A) 0.5 (B) 1.0
(C) 0.25 (D) 0.75

57. Which is not true regarding bypass stream ?

(A) Passes through all stages
(B) Affects the final product composition
(C) Skips one or more stages
(D) Affects the component material balances

58. A saturated solution at 30 °C contains 5 moles of solute (M W=50 kg/kmol) per kg of solvent (M.W=20 kg/kmol). The solubility at 100 °C is 10 moles of solute/kg solvent. If 10 kg of the original solution is heated to 100 °C, then the weight of the additional solute that can be dissolved in it is

(A) 0.25 kg (B) 1 kg
(C) 2 kg (D) 3.34 kg

**59.** The products of combustion of methane with air (21% $O_2$ and 79% $N_2$) in mole percent on dry basis are $CO_2$-10; $O_2$-2.37; CO-0.53 and $N_2$-87.1%. Then the mole ratio of $CH_4$ to $O_2$ in the feed stream is

(A) 1.05 (B) 0.6
(C) 0.51 (D) 0.45

**60.** For the reaction of CO (g) +(1/2)$O_2$ (g) $\rightarrow$ $CO_2$, if the standard heats of formation of CO and $CO_2$ are $H_1$ and $H_2$ respectively, then standard heat of the reaction is

(A) $H_1+H_2$ (B) $H_1-H_2$
(C) $-H_1-H_2$ (D) $H_2-H_1$

**61.** Which among the following is not a steady state flow reactor ?

(A) CSTR (B) Plug Flow Reactor
(C) Batch Reactor (D) Tubular Reactor

**62.** The units of a first order rate constant

(A) $Sec^{-1}$ (B) mol $lit^{-1}sec^{-1}$
(C) $lit.mol^{-1}sec^{-1}$ (D) $lit^{-1}mol^{-1}sec^{-1}$

**63.** In the integral method of analysis, for 2A$\rightarrow$Products, a plot of $1/C_A$ vs time gives a straight line of intercept and slope respectively as

(A) $C_{AO}$ and k (B) $1/C_{AO}$; 1/k
(C) $1/C_{AO}$, k (D) $C_{AO}$, 1/k

**64.** In a PFR of volume 200 lit, if the feed flow rate is 100 mol/hr at an initial concentration of $C_{AO}$=10 mol/lit, the space time is

(A) 10 hr (B) 20 hr
(C) 30 hr (D) 40 hr

**65.** For the reaction A $\rightarrow$ 5R, the fractional change in volume $\varepsilon$ is

(A) 2 (B) 3
(C) 4 (D) 5

**66.** For constant density systems, the area under the plot of $-1/r_A$ vs $C_A$ for a PFR between initial and final concentrations gives

(A) $T/C_{AO}$ (B) T
(C) $V/F_{AO}$ (D) 1/T

**67.** N PFRs in series of with a total volume of V gives the same conversion as a single PFR of volume

(A) NV (B) V/N
(C) V (D) 2NV

**68.** In an ideal CSTR, the concentration of species inside the reactor is

(A) Same as Inlet (B) Same as Exit

(C) Not same as Exit (D) Can't say

**69.** The half-life of $n^{th}$ order reaction in a batch reactor depends on

(A) Rate constant (B) Order of reaction

(C) Initial concentration (D) All of the above

**70.** For solid catalyzed reactions, Thiele modulus is defined as

(A) diffusion rate/intrinsic reaction rate

(B) [diffusion rate/intrinsic reaction rate]$^{1/2}$

(C) intrinsic reaction rate/diffusion rate

(D) [ intrinsic reaction rate/diffusion rate]$^{1/2}$

**71.** The units of residence time distribution, E is

(A) time (B) No Units

(C) time$^{-1}$ (D) time$^{-2}$

**72.** The slow reactions in gas/porous catalyst systems are influenced by

(A) Pore diffusion (B) Surface kinetics

(C) Film diffusion (D) Particle $\Delta T$

**73.** The reactor that suits the most for studying the kinetics of solid catalyzed reactions is

(A) Batch reactor (B) Differential reactor

(C) Packed bed reactor (D) Mixed Flow reactor

**74.** The resistance to pore diffusion is given by

(A) Thiele modulus (B) Weisz modulus

(C) Effectiveness factor (D) All of the above

**75.** For heterogeneous systems, the extra term that comes in the rate expression when compared to homogeneous system is

(A) Mass transfer term (B) Concentration term

(C) Temperature term (D) None

**76.** For dilute solutions, diffusivity in liquids is proportional to

(A) $T^{3/2}$ (B) T

(C) $T^{1/2}$ (D) No effect

where T is the absolute temperature of solution.

77. The theory that postulates the steady state concentration gradient is
(A) Surface Stretch theory (B) Surface Renewal theory
(C) Film theory (D) Penetration theory

78. The analogous dimensionless group in heat transfer to Sherwood number in mass transfer is
(A) Reynolds Number (B) Nusselt Number
(C) Prandtl Number (D) Grashoff Number

79. Which is not the characteristic of an ideal tower packing material in gas-liquid operations ?
(A) Small interfacial area between phases
(B) Large interfacial area between phases
(C) Chemically inert
(D) Structural strength

80. If in an absorption, the liquid and gas flow rates are $1.796 \times 10^{-3}$ kmol/s and 0.01052 kmol/s respectively and slope of the equilibrium curve is 0.1225, then the absorption factor is
(A) 1.125 (B) 1.366
(C) 0.732 (D) 0.889

81. No separation is possible by distillation, if the value of relative volatility, $\alpha$ is
(A) 1 (B) 1.25
(C) 1.5 (D) 2.0

82. The single stage operation among the following is
(A) Continuous Rectification (B) Differential Distillation
(C) Fractionation (D) Flash Vaporization.

83. As reflux ratio in distillation is increased to infinity, then which is true ?
i Number of trays become zero
ii Operating curves coincide with 45° diagonal
iii Number of trays becomes infinity
iv Operating curves deviate most from 45° diagonal
(A) i and ii (B) ii and iii
(C) ii and iv (D) i and iv

84. In a gas-liquid operation, at very low gas velocities, the phenomenon in which much of the liquid rains down through the openings of the tray is
(A) Flooding (B) Coning
(C) Weeping (D) Dumping

85. The units of gas hold-up is
(A) $m^3$ (B) $m^3/kg$
(C) $m^3/m^3$ (D) $kg/m^3$

**86.** Which cannot be the unit for mass transfer coefficient ?
(A) moles transferred/(area)(time)(pressure)
(B) moles transferred/(area)(time)(mole fraction)
(C) moles transferred/(area)(time)(mass fraction)
(D) moles transferred/(area)(time)(mass)

**87.** In drying, if moisture contained by a substance exerts an equilibrium vapor pressure that is less than that of the pure liquid at the same temperature is
(A) Free Moisture (B) Bound Moisture
(C) Unbound Moisture (D) Equilibrium Moisture

**88.** Which is not recommended for leaching operation ?
(A) High temperature (B) Low temperature
(C) High solubility of solute (D) Low liquid viscosity

**89.** In the McCabe thiele diagram, if the x coordinate of the point of intersection of q-line and the vapor-liquid equilibrium curve is greater than the x coordinate of the feed point, then the quality of the feed is
(A) Saturated Vapor (B) Superheated Vapor
(C) Liquid below bubble point (D) Saturated liquid

**90.** If in a counter current gas absorption, if the liquid-gas flow rate is increased, then which is true ?
(A) Operating line shifts towards equilibrium curve
(B) Operating line shifts away from equilibrium curve
(C) No shift of the operating line
(D) Concentration of absorbed species increases in the exit liquid stream.

**91.** Which of the pressure sensors is non-linear ?
(A) Liquid column manometer (B) Ring Balance
(C) Strain gauge on diaphragm (D) LVDT type

**92.** Which class of temperature measurement systems applies for widest range of temperature ?
(A) Solid Expansion type (B) Resistance type
(C) Thermocouple type (D) Liquid Expansion type

**93.** A constant volume gas thermometer works on the principle of
(A) Archimedes principle (B) Boyle's Law
(C) Charles Law (D) Pascal's Law

**94.** The generation of emf in thermocouples is explained by
(A) Seebeck effect (B) Ohms Law
(C) Stefan Boltzmann Law (D) Joule Heating effect

**95.** When a strip of iron and copper is heated
(A) it does not bend
(B) it gets twisted
(C) it bends with iron on concave side
(D) it bends with copper on concave side

**96.** Which is incorrect regarding the first order response system ?
(A) $\Delta$(Input)=Kp $\Delta$(Output)
(B) $\Delta$(Output)-$\Delta$(Input)=Kp
(C) $\Delta$(Input)-$\Delta$(Output)=Kp
(D) $\Delta$(Output)=Kp $\Delta$(Input), where Kp is steady state gain.

**97.** For a first order system, after one time constant, the percent response attained of the final value is
(A) 33.33% (B) 63.2%
(C) 75.5% (D) 100%.

**98.** Which is not true regarding PI control ?
(A) Order of response decreases
(B) Order of response increases
(C) Large Kc values produce very sensitive response
(D) As time constant decreases for constant Kc, response becomes more oscillatory

**99.** The amplitude ratio is defined as
(A) $K_p/[T_p^2\omega^2 + 1]$ (B) $[T_p^2\omega^2 + 1]/K_p$
(C) $K_p/[T_p^2\omega^2 + 1]^{1/2}$ (D) $K_p/[T_p^2\omega^2 + 1]^2$

**100.** The time lag of a first order instrument is
(A) T (B) $(1/\omega)\tan^{-1}(\omega T)$
(C) $(\omega)\tan^{-1}(\omega T)$ (D) $e^{-T}$

**101.** The major drawback of ammonium nitrate as a fertilizer is
(A) High Nitrogen content (B) Quick acting nitrate
(C) Slow acting ammoniacal nitrogen (D) Tendency to cake on storage

**102.** Which is incorrect regarding sulfuric acid ?
(A) Dibasic acid (B) Dehydrating agent
(C) Reducing agent (D) Forms hydrates

**103.** Oleums are
(A) $SO_3$ in water (B) $H_2SO_4$ in water
(C) $HNO_3$ in water (D) $NO_3$ in water

**104.** In the Kraft pulping process, the primary material added to the cooking liquor is

(A) $Na_2SO_4$ (B) $H_2SO_4$

(C) $NaHSO_4$ (D) Lime

**105.** Sizing is added to paper mainly to

(A) have desired color

(B) improve the finish

(C) increase penetration resistance to liquids

(D) to reduce cost

**106.** Which operation is not involved in oil processing ?

(A) Bleaching (B) Dehydrogenation

(C) Refining (D) Deodorization

**107.** Phosphatic fertilizer is graded based on its

(A) P content (B) $PCl_3$ content

(C) $H_3PO_4$ content (D) $P_2O_5$ content

**108.** Bleaching powder is represented by the formula

(A) $Ca(ClO_3)_2$ (B) $CaCl(OCl)$

(C) $Ca(OCl)_2$ (D) $Ca(ClO_4)_2$

**109.** Soap may be manufactured by

(A) hydrolysis of tallow

(B) hydrogenation of vegetable oils

(C) boiling of vegetable oils/tallow with caustic soda solution

(D) oxidation of tallow

**110.** For petroleum products, °API is given by

(A) (131.5/S)-141.5 (B) (141.5/S)-131.5

(C) (145/S)-130 (D) 141.5-(131.5/S)

where S is specific gravity at 60°F/60°F.

**111.** Profitability measure that considers time value of money is

(A) Net present worth (B) Return on investment

(C) Payback period (D) Net return

**112.** Which does not come under working capital ?

(A) Raw materials (B) Salaries

(C) Equipment (D) Finished products in stock

**113.** The relationship between the effective annual interest rate, $i_{eff}$ and nominal interest rate r is

(A) $i_{eff}=\ln(r+1)$ (B) $i_{eff}=e^{r}-1$

(C) $i_{eff}=\ln r-1$ (D) $i_{eff}=e^{r}$

**114.** In a straight line depreciation method, it is assumed that the value of property

(A) decreases linearly with time

(B) decreases exponentially with time

(C) decreases logarithmically with time

(D) remains constant with time

**115.** Present worth P, of future amount of money F for discrete discounting is

(A) $P=Fe^{-rN}$ (B) $F=Pe^{-rN}$

(C) $P=F(1+i)^{-N}$ (D) $F=P(1+i)^{-N}$

**116.** Which is the correct statement for profit ?

(A) Revenue Operating cost (B) Revenue Fixed cost

(C) Revenue Total cost (D) Revenue Book value

**117.** The unknown cost of desired capacity can be estimated from the known cost of another equipment from the formula

(A) $(cost)_1=(cost)_2\,[(capacity)_2/(capacity)_1]$

(B) $(cost)_1=(cost)_2\,[(capacity)_1/(capacity)_2]$

(C) $(cost)_1=(cost)_2\,[(capacity)_2/(capacity)_1]^{0.6}$

(D) $(cost)_1=(cost)_2\,[(capacity)_1/(capacity)_2]^{0.6}$

**118.** For most chemical plants, the ratio of working capital to total capital investment is

(A) 10-20% (B) 80-90%

(C) 50-60% (D) 1-2%

**119.** Pitot tube is used to measure

(A) average velocity (B) point velocity

(C) volumetric flow rate (D) viscosity

**120.** The cost of heat exchanger is mainly a function of

(A) Area (B) Volume

(C) Orientation (D) All of the above

**SPACE FOR ROUGH WORK**

# CHEMICAL ENGINEERING (CH)

## SET-A

| Question No | Answer | Question No | Answer |
|---|---|---|---|
| 1 | D | 61 | C |
| 2 | C | 62 | A |
| 3 | A | 63 | C |
| 4 | A | 64 | B |
| 5 | A | 65 | C |
| 6 | C | 66 | B |
| 7 | B | 67 | C |
| 8 | C | 68 | B |
| 9 | A | 69 | D |
| 10 | D | 70 | A |
| 11 | C | 71 | C |
| 12 | A | 72 | B |
| 13 | D | 73 | D |
| 14 | D | 74 | C |
| 15 | B | 75 | A |
| 16 | A | 76 | B |
| 17 | D | 77 | C |
| 18 | C | 78 | B |
| 19 | B | 79 | A |
| 20 | A | 80 | B |
| 21 | B | 81 | A |
| 22 | C | 82 | D |
| 23 | A | 83 | A |
| 24 | D | 84 | C |
| 25 | A | 85 | C |
| 26 | B | 86 | D |
| 27 | C | 87 | B |
| 28 | C | 88 | B |
| 29 | B | 89 | C |
| 30 | A | 90 | B |
| 31 | A | 91 | B |
| 32 | B | 92 | C |
| 33 | D | 93 | C |
| 34 | A | 94 | A |
| 35 | B | 95 | C |
| 36 | A | 96 | D |
| 37 | D | 97 | B |
| 38 | D | 98 | A |
| 39 | A | 99 | C |
| 40 | C | 100 | B |

| | | | |
|---|---|---|---|
| 41 | B | 101 | D |
| 42 | A | 102 | C |
| 43 | C | 103 | A |
| 44 | D | 104 | A |
| 45 | C | 105 | C |
| 46 | B | 106 | B |
| 47 | C | 107 | D |
| 48 | A | 108 | B |
| 49 | C | 109 | C |
| 50 | D | 110 | B |
| 51 | B | 111 | A |
| 52 | C | 112 | C |
| 53 | A | 113 | B |
| 54 | C | 114 | A |
| 55 | D | 115 | C |
| 56 | A | 116 | C |
| 57 | A | 117 | D |
| 58 | C | 118 | A |
| 59 | D | 119 | B |
| 60 | D | 120 | A |