

17206

21819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (8) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any TEN :

20

- (a) State the difference between Normality & Molarity.
- (b) Name any four unit operations.
- (c) Convert 120 °C & -15 °C to °F.
- (d) Define Conversion and Yield.
- (e) Define limiting reactant and excess reactant.
- (f) State the difference between basic unit and derived unit.
- (g) Define vapour pressure and partial pressure.
- (h) Define weight % and mole %.
- (i) Draw symbol of centrifugal pump and ball mill.

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P.T.O.

- (j) State the principle of mercury thermometer.
- (k) State two uses of nitric acid.
- (l) Name any two chemical industry with their product.

2. Attempt any FOUR :**16**

- (a) Calculate average molecular weight of air.
- (b) How will you prepare 3 litre 1 N solution of NaOH ? (At. wt. Na = 23, O = 16, H = 1)
- (c) Write two names of the following industry :
 - (1) Pharmaceutical industry
 - (2) Food industry
- (d) Define Size reduction; Size separation; Sedimentation; Filtration.
- (e) Define drying and importance of drying in industry.
- (f) Explain construction and working of redwood viscometer.

3. Attempt any FOUR :**16**

- (a) The concentration of acetic acid solution is 25% by weight. Find molality of solution.
- (b) Describe the methods of expressing composition of solutions.
- (c) 100 kg NaCl is mixed with 200 kg KCl. Find weight % & mole % composition of the mixture. (At. wt. Na = 23, K = 39, Cl = 35.5)
- (d) Explain Conduction and Radiation mode of heat transfer with suitable example.
- (e) Explain saponification & esterification with example.
- (f) State Amagat's & Dalton's law and give its expression.

4. Attempt any FOUR :**16**

- (a) Explain distillation and drying with suitable example.
- (b) Find molarity and normality of 20% by weight H_2SO_4 solution.
(Given : Specific gravity is 1.2)
- (c) Convert 600 mm Hg to following units :
 - (i) atm
 - (ii) bar
 - (iii) Pa
 - (iv) kg/cm^2
- (d) Give uses of :
 - (i) centrifugal pump
 - (ii) Blowers
 - (iii) Fans
 - (iv) Compressor
- (e) How are liquids and gases stored in industries ?
- (f) Draw a neat diagram of sight glass method and label it.

5. Attempt any FOUR :**16**

- (a) Define oxidation and reduction. Give one reaction for each.
- (b) Explain (i) Cracking (ii) Chlorination with suitable example.
- (c) Explain yield and selectivity.
- (d) Explain the importance of size reduction.
- (e) Draw process flow sheet for manufacture of H_2SO_4 .

P.T.O.

- (f) Draw flowsheet symbols for
 - (i) Mixer
 - (ii) Vaporiser
 - (iii) Packed
 - (iv) Column
 - (v) Jacketed vessel

6. Attempt any FOUR :

16

- (a) Explain the method of measuring density by specific gravity bottle.
 - (b) Name any four personal protective device and its use.
 - (c) Explain working of mercury thermometer with neat sketch.
 - (d) Explain level measurement by Bob and Tape method.
 - (e) Define Absolute pressure, Gauge pressure, vacuum pressure and atmospheric pressure.
 - (f) With neat sketch, explain U-tube manometer.
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