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SARDAR PATEL UNIVERSITY

M.Sc. (Polymer Science Technology) Semester-II Examination-2016
Tuesday, 12th April-2016
10:30 A.M. to 01:30 P.M.
PS02EPST05: APPLIED & INDUSTRIAL CHEMISTRY - II

Total Marks: 70

Note: (1) Attempt all questions.
(2) Figures to the right indicate marks.

Q. 1 Answer the following multiple choice questions. **(08)**

(1) Separation using distillation relative volatility should be_____.
(i) 1 (ii) <1 (iii) >1(iv) 0

(2) Heat sensitive materials are dried using _____drier
(i) Freeze (ii) Tray (iii) Spray(iv) Rotary

(3) Fertilizers are dried in _____drier.
(i) Freeze (ii) Tray (iii) Spray (iv) Rotary

(4) Water always boils when it's _____.
(i) Temperature reaches 100^0C (ii) vapour pressure equals 76 cm of Hg
(iii) saturated vapour pressure equals external pressure on its surface
(iv) saturated vapour pressure is less than the atmospheric pressure

(5) In a shell & tube heat exchanger_____.
(i) Square pitch gives more heat transfer area than triangular pitch.
(ii) Triangular pitch gives more heat transfer area than square pitch.
(iii) Both square & triangular pitch give same heat transfer area.
(iv) Cleaning facility is same in both square & triangular pitch.

(6) The pitot tube is used to measure_____.
(i) Point velocity (ii) kinematic viscosity (iii) average velocity
(iv) absolute viscosity

(7) Crushers are _____ speed machines for coarse reduction of large quantities of solids.
(i) High (ii) slow (iii) medium (iv) none of this`.

(8) Rate of heat transfer per unit area is called_____.
(i) heat flux (iii) latent heat
(ii) sensible heat (iv) heat transfer co-efficient

Q. 2 Attempt **any seven** of the following. **(14)**

(1) Explain Freeze drying.
(2) Draw a neat labelled diagram of spray drier.
(3) Define dew point and bubble point.
(4) Explain distillate and residue.
(5) Discuss the criteria for selecting solvent in gas absorption.
(6) Explain roller mills.
(7) Explain the working of a pitot tube with neat labelled diagram.
(8) What are filter aids? Why are they used?

(9) Explain term of 'magma'?

Q. 3 (a) Explain the various parts and functions of fractionator. **(06)**

(b) Wet pellets are to be dried in through circulation dryer. The humidity of inlet gas is 0.01 and saturated humidity of gas is 0.031.Mass velocity of gas is 815 kg/hr.m^2.velosity of air is 0.59 and viscosity of gas is 0.046kg/hr.m. Diameter of particle is 0.053m.interficial area is 86 m^{-1}& thickness of cake is 0.167m. The density of gas is 37.9 kg/m^3 and Columbus factor is 0.06. Than calculate rate of drying. **(06)**

OR

(b) Describe on vacuum crystallizers. **(06)**

Q. 4 (a) Differentiate between constant pressure and constant rate filtration. Why is combination of constant pressure and constant rate filtration preferred? **(06)**

(b) Answer the following. **(06)**

1. Enlist the desirable characteristics of good tower packings.
2. Enlist the requirements for a good filter medium.

OR

(b) Answer the following. **(06)**

1. Distinguish between pressure filters and vacuum filters.
2. Discuss the criteria for selecting solvent in gas absorption.

Q. 5 (a) Explain the working of shell and tube heat exchanger with the help of a neat labelled diagram. **(06)**

(b) Discuss prandtls boundary layer concept. **(06)**

OR

(b) Calculate the number of tube required heat exchanger which has to be cool 52000 kg/hr of hot liquid from 65°C to 38°C using 42000 kg/hr cold liquid entering at 8°C.The specific heat of fluid 3.5 KJ/Kg.K. and of cold fluid is 4.18 KJ/Kg.K. also find LMTD for both counter and parallel flow. The dimeter of surface is 4.0cm.and U_o=2064. **(06)**

Q. 6 (a) Explain smooth-roll crusher. **(06)**

(b) Describe on fluid energy mills. **(06)**

OR

(b) Describe on attrition mills for size reduction equipment. **(06)**

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