SARDAR PATEL UNIVERSITY
F.Y.B.Sc. (IInd Semester) EXAMINATION
2012
Wednesday, 18th April
11.00 a.m. to 1.00 p.m.

US02CICV02 :INDUSTRIAL CHEMISTRY VOCATIONAL

(METALLURGY and MATERIAL SCIENCE)

Total Marks :70

Note: Figures to the right indicate marks.

Q.1 Answer the following questions by choosing any one of the given   [10]
     options.
  1. Rate of filteration depends on _____
      (a) pressure difference across filter media.
      (b) surface area of filter media.
      (c) resistance of filter media and cake.
      (d) all the above.
  2. Plate and frame filter press is _____
      (a) cake filter   (b) Vacuum filter   (c) Centrifugal filter
  3. Filter aid may be used by _____ prior to filteration.
      (a) its addition in slurry
      (b) developing its precoat on filter media
      (c) both (a) and (b)
  4. Swirling and vortex formation is the feature of _____ during
      mixing.
      (a) unbaffled tank   (b) baffled tank   (c) both (a) and (b)
  5. Flow pattern in agitated versel depends on _____
      (a) design of impeller and tank
      (b) characteristics of material under mixing
      (c) both (a) and (b)
  6. Paddle impeller essentially consist of _____ blades
      (a) two   (b) three   (c) four or more
  7. In ball mill, size reduction involve _____ action.
      (a) impact   (b) attrition   (c) both (a) and (b)
  8. Size separation in screening is preliminarily based on _____
      (a) size of particle
      (b) density of particles
      (c) None of above
  9. Solids whose surface be easily wetted by water are known as ____
      (a) hydrophilic   (b) hydrophobic   (c) both (a) and (b)
 10. Cyclones are used for _____
      (a) collecting heavy and coarse dust
      (b) separating coarse from dust
      (c) both (a) and (b)

Q.2   Answer the following short questions **(Any Ten)**   [20]
  1. Define and explain filteration operation.
  2. List the characteristics of good filter media.
  3. What are filter aids ? Explain its role in filteration.
  4. Explain free settling and hindered settling.
  5. Give sketch of batch settling test.
  6. Explain vortex and swirling formation in mixing tank.
  7. List the machinaries designed for mixing solids with solids and viscous masses.
  8. Sketch various designs of impellers.
  9. State various trommel arrangements.
 10. Write equation showing definite relationship among size of feed, product and rolls.
 11. Explain mixing operation and state mixing problems.
 12. State Rittinger's law

Q.3
 (a) State and explain rate equation of filteration   [04]
 (b) Discuss general construction and working of rotary vacuum filter.   [06]
                                    OR
Q.3   Discuss general construction and working of plate and frame filter press.   [10]

Q.4   Giving sketch, discuss the design and working of cyclone separator.
                                    OR
Q.4   Write short note on Froath Floatation Process.   [10]

Q.5   Answer the following :   [10]
      (i)   State importance of mixing problem.
      (ii) How swirling and vortex formation be prevented in mixing tank ?
      (iii) Write the factors affecting mixing operation.
                                    OR
Q.5   Discuss about various types of impellers employed with mixing tank.   [10]

Q.6
 (a) List crushing and grinding machinaries   [04]
 (b) For selection of crushing rolls, prove that tangent of angle of nip (α)   [06]
     must be Less than coefficient of friction (μ).
                                    OR
Q.6   Describe design and working of
 (a) ball mill   [06]
 (b) Vibrating screen   [04]

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