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# SE-6727

## B. E. - III (Sem - V) (Chemical) Examination

### May / June – 2011

## Mechanical Operations

Time : **3** Hours] [Total Marks : **100**

**Instructions :**

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
**Fillup strictly the details of ☛ signs on your answer book.**

Name of the Examination :

☛ **B. E. - III (Sem - V) (Chemical)**

Name of the Subject :

☛ **Mechanical Operations**

☛ Subject Code No. : **6 7 2 7** ☛ Section No. (1, 2,.....) : **1, 2**

Seat No. :

Student's Signature

(2) Answer to the two sections are to be written in seperate Answer books,

(3) Figure to the right indicate full marks.

(4) Assume suitable data whenever necessary.

(5) Draw neat and clean sketch whenever necessary.

## SECTION - I

**1** (a) Explain in brief. **10**

(i) Define work index.

(ii) What is Mechanical efficiency ?

(iii) List the advantages of size reduction.

(iv) Define volume surface mean diameter.

(v) Define free settling.

(b) Discuss about fluid energy mill. **6**

**2** Answer any **two** of the following. **18**

(a) Explain construction and working of Ball mill.

(b) What are screen capacity and screen effectiveness ? Derive the expression for screen effectiveness.

(c) Define sedimentation. Explain batch gravity sedimentation process in detail.

3 Answer any **four** of the following. **16**

(a) Agitated mill.

(b) Explain thickner.

(c) Compare ideal screen and actual screen.

(d) Jaw Crusher.

(e) Different properties of solids.

## SECTION - II

4 (a) Give the answer of all questions. **10**

(i) What is filtration ?

(ii) What is constent-pressure filtration ?

(iii) For alkalin slurry _____ are used and for acidic slurry _____ are used as a filter media.

(iv) In microfiltation. Particles in the size range of _____ to _____.

(v) Define : fludization.

(vi) Define : two phase theory.

(vii) What is turbulent fluidization ?

(viii) Principles of centrifugal filtration ?

(ix) Give types of filter.

(x) Give name of cake filter.

(b) Power required to crush 100 ton/h of limestone if 80% of the feed pass a 2-in. Screen and 80% of the product a $\frac{1}{8}$ in screen. **4**

(c) What is mixing effectiveness. **4**

5 Attempt any **two**. **16**

(a) Explain principle, construction & working of Ball mill.

(b) Explain principle, construction & working of plate & frame filter press.

(c) Explain filtration.

6 Attempt any **four**. **16**

(i) Continuous filtering centrifuge explain with neat sketch diagram.

(ii) Explain rate of sedimentation with diagram.

(iii) Explain equipment operation.

(iv) Define crusher & explain one of the crusher with diagram.

(v) Explain Jet mixers.

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