

Course: - : First Year B. Tech(Group- A Chem, Mech, Civil)

Sem: II

Subject Name: Engineering Chemistry

Subject Code: BTBS 202

Max Marks: 20

Date:- 12/03/2019

Duration:- 1 Hr.

Instructions to the students:

1. Do not write anything on question paper
2. Neat and labeled diagram must be drawn whenever necessary.
3. Use of non programmable calculator is allowed.
4. Figures to the right indicate full marks.
5. Assume suitable data if required
6. All questions are compulsory

Q.1 Attempt the following Questions

(Level/CO) Marks

1. If degree of freedom for any system is zero, the system is said to be
a) Zero Variant b) Divariant c) Invariant d) Both a & c /CO3
2. For the given system degree of freedom is, /CO3



3. Phase diagram of sulphur system has.....triple point(s). /CO3
a) 4 b) 3 c) 2 d) 1
4. Exhausted zeolite can be regenerated by using /CO1
a) HCl b) NaOH c) NaCl d) All of these
5. Sodium Zeolite can be represented as /CO1
a) $\text{Ca}_2\text{O} \cdot \text{Si}_2\text{O}_3 \cdot x\text{Na}_2\text{O} \cdot y\text{H}_2\text{O}$ b) $\text{Mg}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot x\text{SiO}_2 \cdot y\text{H}_2\text{O}$
c) $\text{Si}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot x\text{Na}_2\text{O} \cdot y\text{H}_2\text{O}$ d) $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot x\text{SiO}_2 \cdot y\text{H}_2\text{O}$
6. Hardness of water is usually expressed in equivalent with /CO1
a) $\text{Ca}(\text{OH})_2$ b) CaCl_2 c) CaO d) CaCO_3

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Q.2 Solve Any Two of the following.

3 X 2

- A) What is condensed phase rule? When it is applied? /CO3
 - B) Ion exchange method is more advantageous than zeolite method, give your review. /CO1
 - C) Define the term Phase, Invariant system and temporary hardness /CO1, CO3
- Q.3 Solve Any One of the following.**
- A) How we determine hardness of water by EDTA method? What happen when hard water is used for industrial applications? /CO1
 - B) Draw neat labeled phase diagram for water system and explain areas, curves and triple points in it. What are the advantages of phase rule? /CO3

*** End ***

Isometric view of a mechanical part. The part features a circular top face with a radius of $R30$ and a central hole of diameter $\varnothing 45$. The top face is positioned at a height of 50 from the base. A vertical support of thickness 10 connects the top face to the base. The base is a rectangular plate with a width of 20 and a height of 25 . A horizontal support of thickness 10 extends from the base to the vertical support. A curved fillet with a radius of $R15$ transitions between the base and the vertical support. The overall width of the part is 90 . An arrow labeled X indicates the direction of the X-axis.

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