

B.E DEGREE EXAMINATIONS: NOV/DEC 2013

Second Semester

CHY103: APPLIED CHEMISTRY

(Common to AERO, ME, MCE and AU)

Time: Three Hours**Maximum Marks: 100****Answer all the Questions:-****PART A (10 x 1 = 10 Marks)**

- The calorific value of a coal sample is higher, if its
 - Moisture content is high
 - Ash content is high
 - Volatile matter is high
 - Fixed carbon is high
- Producer gas is a mixture of
 - CO+H₂
 - CH₄+H₂
 - CO+N₂
 - CO + CH₄
- Porosity in a refractory brick generally increases
 - density
 - resistance to spalling
 - strength
 - melting point
- The monomers used in the preparation of polycarbonates are
 - Diphenylcarbonate and bisphenol
 - Hexamethylenediamine and adipic acid
 - Hexamethylenediisocyanate and 1,4 butane diol
 - Formaldehyde and phenol
- During wet corrosion,
 - the anodic part undergoes oxidation
 - the cathodic part undergoes oxidation
 - the anodic part undergoes reduction
 - neither anodic nor cathodic parts undergo any changes
- Brass utensils are usually tinned since
 - tin is more anodic than copper or zinc
 - copper is more cathodic than zinc
 - tin is a noble metal and protects brass
 - zinc is more anodic than tin
- A semi-permeable membrane allows the flow of
 - solvent particle
 - solute particle
 - both solvent and solute particles
 - neither solvent nor solute particles
- Hard water is unfit for use in boilers for steam production because
 - its boiling point is higher
 - steam is generated at a high pressure
 - It leads to scale formation inside the boiler
 - Water undergoes decomposition into oxygen and hydrogen

Page 1 of 3

- For a one component system, the maximum number of variables may be
 - zero
 - one
 - two
 - three
- Tungsten(IV) oxide is heated in the current of hydrogen to get spongy metal powder. This process is an example of
 - mechanical pulverization
 - atomization
 - chemical reduction
 - briquetting

PART B (10 x 2 = 20 Marks)

- Define ignition temperature.
- Why is net calorific value less than gross calorific value?
- What is the maximum MOH's hardness value? Name any one material that has maximum value?
- What is meant by viscosity index?
- Corrosion of water filled steel tanks occurs below the waterline. Give reason.
- Which of the following metals could provide cathodic protection to iron? Al, Zn, Cu and Ni why?
- Why should the presence of CO₂ in a boiler feed water be avoided?
- What is meant by sedimentation?
- What is condensed phase rule?
- What is atomization?

PART C (5 x 14 = 70 Marks)

- What is proximate analysis? How is it done? What is its significance? (7)
 - What is cetane number? How can it be improved? (7)

(OR)

 - How will you determine calorific value by bomb calorimeter? (7)
 - What are the characteristics of metallurgical coke? (7)
- Explain the following: (i) graphite as solid lubricants (ii) Flash and fire point of the lubricants. (7)
 - What are the difference between polymer blends and alloys? Give their properties. (7)

(OR)

 - Explain the preparation and properties of high alumina and zirconia bricks. (7)
 - What are artificial abrasives? Explain any two artificial abrasives. (7)

Page 2 of 3

- Explain the mechanism of electro chemical corrosion. (7)
 - What are paints? Write its ingredients and their functions. (7)

(OR)

 - What are the factors affecting corrosion? (7)
 - How is corrosion controlled by cathodic protection? (7)
- How is scale formation prevented by ion exchange method? (7)
 - What is meant by caustic embrittlement? How is it formed? How can it be prevented? (7)

(OR)

 - Explain priming and foaming. (4)
 - Explain the various methods of disinfection of drinking water. (10)
- State phase rule. Explain the terms involved in phase rule with examples. (7)
 - What are the advantages and limitations of powder metallurgy? (7)

(OR)

 - Explain the following: compacting and sintering. (7)
 - Explain the phase diagram of two component system with an example. (7)
