

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. (FoA) Winter 2019 - 20 Examination

Semester: 3/1
Subject Code: 20103201
Subject Name: Engineering Chemistry

Date: 25/11/2019
Time: 10:30am to 01:00pm
Total Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 (A) Fill in the banks (All are compulsory) (Each of 0.5 mark) (05)

- I. The form of matter which is uniform throughout in chemical composition and physical state is know as _____.
- II. Bomb calorimeter is used for determination of calorific value of _____ fuels..
- III. _____ and _____ used for the synthesis of Buna-S rubber.
- IV. _____ is used as solid lubricant.
- V. _____ is due to the presence of bicarbonate, carbonates and hydroxides of the hardness producing metal ions.
- VI Lubricants used in refrigeration systems should have low _____ point.
- VII _____ number is a measure of acidic or basic impurities present in lubricating oil.
- VIII _____ polymerization requires the presence of two functional groups at both the ends of monomer.
- IX Polymerization between styrene and butadinene would lead to the formation of a _____.
- X The estimation of hardness of water by EDTA method involves a _____ titration.

Q.1 (B) Multiple Choice Questions (Each of 0.5 Marks) (10)

- (i) Which of the following is a two-phase system
 - (a) Water and ether
 - (b) Sand in water
 - (c) Kerosene in water
 - (d) All of them
- (ii) How many phases are present in a saturated salt solution containing solid salt?
 - (a) One
 - (b) Two
 - (c) Three
 - (d) none of these
- (iii) Which of the following is a primary fuel?
 - (a) Coke
 - (b) Coal gas
 - (c) Coal
 - (d) Charcoal
- (iv) Charcoal is secondary fuel derived from
 - (a) Wood
 - (b) Lignite
 - (c) Petroleum
 - (d) Coke
- (v) What is the best description of blood?
 - (a) Sol
 - (b) Foam
 - (c) Solution
 - (d) Aersol
- (vi) Which one of the following dispersions does not have liquid continuous phase?
 - (a) Nanosuspension
 - (b) Microemulsio
 - (c) Gel
 - (d) Foam
- (vii) Iron corrodes faster in
 - (a) hard water
 - (b) soft water
 - (c) demineralized water
 - (d) distilled water
- (viii) Ships sailing in ocean suffer from
 - (a) stress corrosion
 - (b) grain-boundary corrosion
 - (c) pitting corrosion
 - (d) waterline corrosion
- (ix) Hardness in water is caused by
 - (a) sodium chloride
 - (b) sodium carbonate
 - (c) calcium chloride
 - (d) potassium nitrate
- (x) temporary hardness of water can be removed by
 - (a) boiling
 - (b) filtration
 - (c) solvent extraction
 - (d) sedimentation

- (xi) Full form of TGA,
 (a) Thermo gravimetric analysis (b) Time gone for analysis
 (c) Temperature gram analysis (d) None of these
- (xii) Which one is the radioactive material
 (a) Uranium (b) Cobalt (c) Ammonia (d) none of these
- (xiii) Oiliness is excellent in
 (a) Mineral oil (b) castor oil (c) olive oil (d) greases
- (xiv) The example of solid lubricant is
 (a) grease (b) Vaseline (c) talc (d) castor oil
- (xv) polymer that softens on heating and stiffens on cooling is called
 (a) thermoset (b) thermoplastic (c) elastomer (d) rubber
- (xvi) polymer with low degree of polymerization is known as
 (a) high polymer (b) oligomer (c) macromolecule (d) copolymer
- (xvii) An example of chain growth polymer is
 (a) nylon 6,6 (b) Bakelite (c) terylene (d) Teflon
- (xviii) Raw rubber on vulcanization becomes
 (a) plastic (b) tacky (c) soft (d) less elastic
- (xix) Which of the functional group show a broad peak around 3300-3400 cm⁻¹
 (a) -OH (b) benzene (c) -CHO (d) CH₄
- (xx) Electrochemical corrosion takes place on,
 (a). Cathodic area (b). Anodic area (c) Near cathode (d) None of these

Q.1 (C) Define the following (Any five out of seven questions) (05)

- (a) Lipids (b) Proteins (c) Vitamins (d) Carbohydrate (e) Food (f) Monomer (g) Polymer

Q.2 Define the following (Any five out of seven questions) (05)

1. Which Lamp is used in IR instrument?
2. Which instrument used for viscosity measured.
3. Give the name of unit used to measure the hardness of water.
4. What means by half-life.
5. Give the definition of enzyme and give its example.
6. List out name of ions which are responsible for the temporary and permanent hardness of water.
7. List out name of radioactive materials.

Q.3 Write short notes (Any five out of six question) (10)

- I) What are the disadvantages of hard water?
- II) Give the classification of colloids in detail.
- III) Write a short note on Calorific value
- IV) Write about classification of fuels.
- V) Write advantages of phase rule.
- VI) Give the classification of polymers.

Q.4 Answer the following questions. (Attempt any three) (15)

- A) Write in detail about temporary and permanent hardness of water.
- B) What is nuclear radiation? Give the types of nuclear radiation and discuss in detail.
- C) Write a short note on scale and sludge formation in boilers.
- D) Write a short note on types of corrosion and discuss in detail.