S.B. Roll No……

APPLIED CHEMISTRY-II

2nd Exam/Common/2254/2451/5424/May'19

Duration: 3Hrs. **M.Marks:75**

SECTION-A

Q1. a) Fill in the blanks. **15x1=15**

i. Sulphide ores are concentrated by _____Process.
ii. The earthly impurities present in the ores are called_____
iii. Chromising is the process of depositing _____on iron.
iv. Percentage of volatile matter in coal can be determined by _____analysis.
v. Water gas is a mixture of Carbon monoxide and_____
vi. Suspension of graphite in water is called_____
vii. The unit of viscosity is_____
viii. A pigment imparts _____to paint.
ix. Natural rubber is a polymer of_____
x. BOD stand for_____

b) State True or False.

xi. Annealing of steel causes softening of steel.
xii. Fire clay bricks are basic in nature.
xiii. A good fuel has high moisture content.
xiv. Bakelite becomes hard on heating and can be remoulded.
xv. Cow dung is biodegradable.

SECTION-B

Q2. Attempt any ten questions. **10x3=30**

a. Differentiate between roasting and calcination.
b. Explain the process of electrolytic reduction for extraction of metals from their fused salts.
c. State and explain Pilling-Bedworth rule.
d. What is galvanization?
e. Write a short note on hydrogen as a future fuel.
f. What are the characteristics of a good fuel?
g. What is fire point and flash point of a lubricant?
h. Explain the mechanism of hydrodynamic lubrication.
i. Give detailed account of three main types of refractories.
j. Define glass and give its chemical composition.
k. Differentiate between thermoplastics and thermosetting plastics.
l. Give the synthesis of Bakelite.
m. What are the various sources of air pollution?
n. Explain green house effect and global warming.

SECTION-C

Attempt any three questions. **3x10=30**

Q3. Give any five methods for the purification of metals.

Q4. a) What are the factors that influence the rate of corrosion?
b) Define the following: metal cladding, metal spraying and cementation.

Q5. a) What is the importance of proximate analysis of coal?
b) Write a note on producer gas and biogas.

Q6. What are the functions of a lubricant? Explain total acid number (TAN) and saponification value of oils.

Q7. What is varnish? What are the constituents of paint?

Q8. Classify the polymers on the basis of synthesis with chemical reactions. Define vulcanization of rubber. Give advantages of vulcanized rubber.

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APPLIED CHEMISTRY-II

2nd Exam/Civil/Mech./Auto/4553/May'19

(FOR 2018 BATCH)

Duration: 3Hrs. **M.Marks:75**

SECTION-A

Q1. a) Fill in the blanks. **15x1=15**

i. Sulphide ores are concentrated by _____ process.
ii. _____ is an ore of aluminium.
iii. Siliconising is the process of coating base metal by _____.
iv. Corrosion of iron is _____ in moist air than in dry air.
v. Full form of LPG is _____.
vi. A good fuel should have _____ moisture content.
vii. The viscocity of grease is _____ than of olive oil.
viii. Optical glass is used for making _____.
ix. A good refractory material should have _____ porosity.
x. _____ is an example of elastomer.

b) State True and False.

xi. Fibers are weaker than elastomers.
xii. Graphite is used as solid lubricant.
xiii. Anthracite coal has highest calorific value.
xiv. Annealing is the process to make steel soft in nature.
xv. Noble gases cause corrosion.

SECTION-B

Q2. Attempt any ten questions. **10x3=30**

a. Distinguish between roasting and calcinations.
b. Explain electromagnetic separation process for concentration of ores.
c. What is an alloy? What are ferrous and non-ferrous alloys?
d. Give one use of i) Nichrome ii) Alnico iii) Nickel steel
e. What do you understand by corrosion?
f. Rusting of iron is quicker in sea water than in ordinary water. Explain.
g. What is power alcohol?
h. What are characteristics of a good fuel?
i. What is calorific value of a fuel? Name the apparatus used to measure calorific value.
j. What are cutting fluids?
k. What are refractories?
l. Give the advantages of varnish.
m. What are natural and synthetic polymers? Give one example of each.
n. What is vulcanization of rubber?

SECTION-C

Attempt any three questions. **3x10=30**

Q3. a) Explain froth floatation process for concentration of sulphide ores.
b) Define a) Mineral b) Ore c) Metallurgy d) Gangue e) Flux.

Q4. a) Distinguish between thermoplastics and thermosetting plastics.
b) What are fuels? What are the advantages of gaseous fuels?

Q5. a) What are the functions of a lubricant? b) What are the characteristics of a good paint?

Q6. a) What is varnish? What are its constituents?
b) Give uses of the following a) Soda-lime glass b) Borosilicate glass

Q7. a) Explain homopolymers and co-polymers with examples.
b) Write brief note on i) Caustic embrittlement ii) Galvanization

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APPLIED CHEMISTRY-I

1st Exam/ Common/2555/0451/5404/May'19

Duration: 3Hrs. **M.Marks:75**

SECTION-A

Q1. a) Fill in the blanks. **15x1=15**

i. Dimensional formula of area is_____
ii. A chemical reaction in which heat is absorbed is known as _____reaction.
iii. Elements of group 16 are also called_____
iv. The full form of TDS is_____
v. One faraday of electrical charge is equal to _____coulombs.
vi. pH of 10^{-3}M HCl solution is equal to_____
vii. For a chemical reaction to be feasible ΔG must be_____
viii. As per electronic concept reduction is _____of electrons.
ix. General formula of alkenes is_____
x. Functional group of carboxylic acids is_____

b) State True or False.

xi. Soaps are sodium or potassium salts of higher fatty acids.
xii. Iron is a d-block element.
xiii. Blood is a buffer solution.
xiv. Cations carry positive charge.
xv. Atomic number of Hydrogen is three.

SECTION-B

Q2. Attempt any ten questions. **10x3=30**

a. What are the essentials of a chemical equation?
b. Balance the following chemical equations:
   $Na + H_2O \longrightarrow NaOH + H_2$
   $CH_4 + O_2 \longrightarrow CO_2 + H_2O$
c. Define Heisenberg's uncertainty principle.
d. Define isotopes, isobars and isotones.
e. Differentiate between sigma bond and pi bond.
f. A sample of hard water is found to contain 204mg of $CaSO_4$ per litre of the solution. What will be the hardness in ppm? Given Atomic mass of Ca = 40, S =32, O = 16 and C = 12.
g. Explain desalination of sea water by reverse osmosis method.
h. Define Boyle's law.
i. Define second law of thermodynamics.
j. Explain Faraday's second law of electrolysis.
k. Give IUPAC names of the following: CH_3Cl, CH_3COOH, CH_3NH_2
l. What is isomerism? Give its types.
m. What are substitution reactions? Give one example.
n. Give any two Industrial applications of electrolysis.

SECTION-C

Attempt any three questions. **3x10=30**

Q3. What is a solution? Explain Molarity, Molality, Normality and Mole fraction.

Q4. Explain in detail: Ionic bond, Covalent bond, Coordinate bond and Metallic bond.

Q5. a) What is permutit? How it can be used to remove hardness of water?
b) Give the disadvantages of hard water.

Q6. Give definition of the following: a) Open syatem b) Isothermal process c) Adiabatic process d) Intensive property e) Spontaneous process.

Q7. a) Define electrochemical cell. Give the representation of an electrochemical cell.
b) Define electrochemical series. Give any two applications of electrochemical series.

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APPLIED CHEMISTRY-I

1st Exam/Civil/Mech./Electrical/ECE/IT/Auto/CSE/Mechatronics/6052/May'19

(FOR 2018 BATCH)

Duration: 3Hrs. **M.Marks:75**

SECTION-A

Q1. Do as directed. **10x1.5=15**

a. The nuclease of an atom contains _____and_____
b. Reducing agents _____Electrons
c. L shell has _____ sub shells.
d. Neutron was discovered by_____
e. Chemical name of permutit is _____
f. Units of molarity are_____.
g. Cations are _____charged ions.
h. The functional group of Ketone is_____
i. Isotopes have same number of protons (T/F)
j. A solution of three components is a binary solution. (T/F)

SECTION-B

Q2. Attempt any six questions. **6x5=30**

i. What are the limitations of a chemical equation?
ii. Differentiate between an orbit and orbital.
iii. What are electrolytes and non-electrolytes?
iv. Define chemical bond. What is the cause of chemical combination?
v. What are the advantages of long form of periodic table?
vi. Differentiate between temporary and permanent hardness of water.
vii. Define the terms Electron, Proton and Neutron.
viii. Explain scale and sludge formation.
ix. Calculate the percentage composition of various elements in $C_2H_2O_4$.[Atomic mass of C=12, H=1 and O=16]
x. How will you define indicator, titration and end point?

SECTION-C

Attempt any three questions. **3x10=30**

Q3. a) Name and explain the quantum numbers. **5**
b) Explain the process of electroplating? **5**
Q4. a) Explain molarity, normality and molality. **5**
b) Write a short note on aufbau principle and hund's rule **5**
Q5. a) Differentiate between alkane and alkyne. **3**
b) Differentiate between 1s and 2s orbital. **2**
c) Balance the following equation by hit and trial method **5**

$$NaOH + Cl_2 \dashrightarrow NaCl + NaClO_3 + H_2O$$

Q6. a) Write the formula of the following compound. **5**
i) Acetic acid ii) Acetaldehyde iii) Acetone iv) Ethene v) Ethyne
b) Differentiate between compound and mixture? **3**
c) What are the causes of hardness of water? **2**
Q7. a) Define covalent bond. Explain it taking at least 2 examples? **5**
b) What is hybridization? What are the main characteristics of hybridization? **5**

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APPLIED CHEMISTRY-II

2nd Exam/Common/2254/2451/5424/Sep'2020

Duration: 1.15 Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any three questions. **3x5=15**

a. Differentiate between roasting and calcinations.
b. What are the characteristics of a good fuel?
c. What are ferrous and non-ferrous alloys? Give examples.
d. What is Galvanization? How it is done?
e. What are the constituents of paint?
f. Write a short note on greases.
g. What is difference between corrosion and erosion?
h. What are the functions of lubricants?
i. What are the sources of water pollution?
j. What are addition and condensation polymers? Give examples.

SECTION-B

Q2. Attempt any one question. **1x10=10**

i. Explain the Open Hearth Process for the manufacturing of steel with well labeled diagram and chemical reactions involved.
ii. What is corrosion? Explain the mechanism rusting of iron by electrochemical corrosion in detail.
iii. a) Give the composition and uses of gun metal and brass.
b) Explain fluid film mechanism of lubrication.
iv. a) What is Buna-s? What are its uses?
b) Explain Global warming.

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APPLIED CHEMISTRY-I

1st Exam/Common/2555/0451/5404/Sep'2020

Duration: 1.15 Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any three questions. **3x5=15**

a. Differentiate between sigma (σ) and pi (π) bond.
b. Define buffer solutions. Give example?
c. Define Homlogous series?
d. Differentiate between Electrolyte and Non-electrolytes?
e. Explain electrolytic refining?
f. Find number of moles in 39 g of Potassium. Given Atomic Weight of Potassium 39 ?
g. Find pH of 10^{-3} M HNO_3?
h. Explain Faradays first law of electrolysis?
i. Explain Oxidation and Reduction on basis of electronic concept. Give examples?

SECTION-B

Attempt any one question. **1x10=10**

Q2. a) Explain Permutit process to remove hardness of water?
b) Explain the process of electroplating?

Q3. a) Explain molarity, normality and molality.
b) Explain Aufbau principle and hund's rule of maximum multiplicity

Q4. a) Define Hybridization, Coavlent bond.
b) Explain structure of BF3 and NH3.5

Q5. Balance the following equation by hit and trial method
a) KClO3 KCl + O2
b) Na2 CO3 + HCl NaCl + CO2 + H2O

Q6. a) Give the main features of Bohr's atomic model?
b) Explain reverse osmosis process for desalination of sea water.

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APPLIED CHEMISTRY-II
2nd Exam/Common/4553/Jun'2021
(For 2018 Batch Onwards)

Duration: 1.15Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any five questions. **5x3=15**

i. Explain electromagnetic separation for concentration of ores.
ii. Differentiate between ferrous and non-ferrous alloys.
iii. What is galvanization of iron? Explain.
iv. Define corrosion? How is it different from erosion?
v. What are the advantages of gaseous fuels over solid and liquid fuels?
vi. Define calorific value of a fuel? What are the units of calorific value?
vii. What are the characteristics of a good lubricant?
viii. What is flash point and fire point of a lubricant?
ix. What is a refractory material?
x. What are the main characteristics of a good paint?

SECTION-B

Attempt any one question. **1x10=10**

Q2. i) Give the uses of the following alloys
a) Nickel steel b) Alnico c) Solder d) Nichrome e) German silver
ii) Explain froth floatation process for concentration of sulphide ores.

Q3. i) State and explain Pilling-Bedworth rule.
ii) Distinguish between thermoplastics and thermosetting plastics.

Q4. i) What should be the characteristics of a good fuel?
ii) Write short notes on a) Biogas b) Water gas

Q5. i) What are the functions of cutting fluids?
ii) What are the advantages of solid lubricants?

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APPLIED CHEMISTRY-II

2nd Exam/Common/2254/2451/5424/Jun'2021

Duration: 1.15Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any five questions. **5x3=15**

i. Explain Van Arkel method for the purification of titanium.
ii. What is galvanization?
iii. How corrosion can be prevented by material selection and design?
iv. Compare solid, liquid and gaseous fuels in terms of calorific value, ash content and combustion control.
v. Give the importance of proximate analysis of coal.
vi. What are the functions of a lubricant?
vii. Define flash and fire point of lubricants.
viii. What are composite materials? Give one example.
ix. Define addition and condensation polymerization. Give one example of each.

SECTION-B

Q2. Attempt any one question. **1x10=10**

a. Discuss in detail any four methods of concentration of the ore.
b. Give a detailed account of factors influencing the rate of corrosion.
c. Write a detailed note on CNG, LPG and producer gas.
d. Discuss in detail the mechanism of lubrication.