END SEMESTER EXAMINATION (REGULAR /RETEST) 2019

Semester: 1st

Subject code: Sc-103

Subject: Chemistry-1(Old/New course)

Full marks: 70 (Part A-25 +Part B-45)

Duration: Three hours.

Instructions:

1. All questions in Part A are compulsory.

2. Answer **any five** from Part B

Part A	Marks-25

Q.1 Fill in the blanks :   1x10=10

a. At STP, temperature is 0°C and pressure is ....atm.

b. 16 grams of methane gas occupies ----------litres at STP.

c. The values of angular quantum no. give the *number* of orbitals.

d. Basicity Of nitric acid is...........

e. Conjugate base of NH_3 is .... *liquid*

f. Ionisation energy of elements ....along the period from left to right.

g. Ionic bond is formed by ....of electrons.

h. PH of distil water is ....

i. In Haber's process of manufacturing ammonia, ...is used as catalyst promoter.

j. During electrolysis metal is liberated at-----------.

Q.2 Write true or false   1x10=10

a. Absolute zero temperature is $0^\circ C$

b. Oxidation and reduction take place simultaneously.

c. Alpha scattering experiment was performed by Thomson.

d. Ozone is an oxidising agent.

e. 1M NaOH solution is a standard solution

f. Transitional elements have variable valency.

g. At equilibrium, both forward and backward reactions stop.

h. Bicarbonates of Ca and Mg make water permanently hard.

i. During electrolysis no chemical change takes place.

j. Hydrolysis of sodium carbonate gives alkaline solution.

Q.3 Choose the correct answer   1x5=5

a. One mole methane gas is equal to

| i) | 1 gram CH_4 | iii) 1 molecule of CH_4 |
| ii) | 16 gram CH_4 | iv) 1 litre at STP |

b. Dual nature of photons was proposed by

| i) | Einstein | iii) De-Broglie |
| ii) | J J Thomson | iv) Rutherford |

c. Ionic compounds are

| i) | hard and rigid | iii) non polar |
| ii) | low melting | iv) non electrolyte |

d. Deionised water is

| i) | saline water | iii) sterilised water |

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ii)   hard water   iv) demineralised water

e. Colour of phenolphthalein in acid medium is

| i) | pink | iii) purple |
| ii) | Yellow | iv) colourless. |

Part B   Marks-45
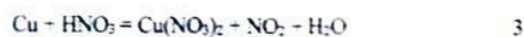
Q.4

a. State and explain Charles law.   2

b. Using Avogadro's hypothesis prove that M=2D   4

c. At $127^\circ C$ temperature and 152 cm pressure calculate the volume occupied by 34 gram of ammonia.   3

Q.5

a. Give the significances of balanced chemical reactions.   3

b. Balance the following reaction by partial method:

$$Cu + HNO_3 = Cu(NO_3)_2 + NO_2 + H_2O$$ 3

c. 24 grams of carbon is burnt in presence of 32 grams of oxygen. Calculate the amount of carbon di oxide produced.   3

Q.6

a. What is Acidimetry?   2

b. State and explain Lewis theory of acid-base with example.   4

c. 30 ml of 0.12N acid solution is neutralised by 20 ml of NaOH. Calculate the strength of NaOH in gram/litre   3

Q.7

a. Write the drawbacks of Bohr's model of atom.   3

b. State and explain Aufbau principle with example   3

3

c. Give the significances of Quantum numbers.   3

Q.8

a. What is periodic law?   *,   2

b. Compare the characteristics of ionic and covalent compounds. 4

c. What is Hydrogen bonding? Give its significances.   3

Q.9

a. Why chemical equilibrium is called dynamic equilibrium?   2

b. Derive an expression for equilibrium constant of reversible
reaction.   4

c. What is homogeneous catalysis? Give example   3

Q.10

a. Draw an electrolytic cell with suitable labelling   3

b: 100 amps current is passed through an acid cell for 6 hours.
Calculate the amount of hydrogen gas liberated at the electrode? 3

c. What is electro chemical equivalent (e.c.e)?   3

Q.11

a. Give the reason of permanent hardness of water.   2

b. Mention the problems faced in boiler using hard water.   2

c. Discuss the Permutit Process of softening of water.   5

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