Total No. of Questions – [5] Total No. of Printed Pages :3

G.R. No.	

Paper Code - U127-105B(RE-F&FF)

JUNE **2018 / RE-EXAM**

F. Y. B. TECH. (COMMON) (SEMESTER - II)

COURSE NAME: Engineering Chemistry COURSE CODE: ES10175B

(2017 PATTERN)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4 and Q.5**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) **a)** What is electroplating? Explain electroplating with process, reactions and figure. Give 2 advantages and 2 applications of electroplating. **[6 marks]**

b) What is principle of cathodic protection? Give the various types of cathodic protection with figure and explanation. **[6 marks]**

c) Define galvanization. Explain the process with the help of diagram. **[4 marks]**

OR

Q.2) **a)** Define corrosion and explain any five factors affecting rate of corrosion related to **nature of metal** **[6 marks]**

b) Explain the mechanism of hydrogen evolution and oxygen absorption with reactions and neat labeled diagram. **[6 marks]**

c) Explain different types of oxide films formed on surface of metal with suitable examples. **[4 marks]**

Q.3) **a)** What are the different types of batteries? Explain the components of Li-MnO_2 cell. Discuss working of the cell with figure and reactions. **[6 marks]**

b) Describe the construction and working of a solid oxide fuel cell (SOFC). **[4 marks]**

c) Describe the working and electrode reactions of Ni-MH battery. Why is it preferred over Ni-Cd battery? **[4 marks]**

OR

Q4) **a)** Explain Lead-acid battery with figure, charging discharging reactions and any two applications. **[6 marks]**

b) What are lithium batteries? How they are classified? Mention any two outstanding features of lithium batteries in comparison with conventional batteries. **[4 marks]**

c) Give the construction with figure, working with reactions of PEMFC. **[4 marks]**

Q.5) Attempt following multiple choice questions: [1x20=20marks]

1) Temporary hardness is also known **[1 mark]**
a) Carbonate hardness b) Non-carbonate hardness
c) Total hardness d) None of above

2) If P = M, then alkalinity of water is due to ions **[1 mark]**
a) OH^- b)HCO_3^- c)CO_3^{-2} d)OH^- and CO_3^{-2}

3) Increase in temperature of water decreases the solubility of **[1 mark]**
a)$MgSO_4$ b)Na_2SO_4 c)$CaSO_4$ d)$ZnSO_4$

4) A sodium zeolite is chemically **[1 mark]**
a) Sodium silicate b) Sodium aluminates
c) Sodium alumino silicate d) Sodium phosphate

5) Dissolved carbon dioxide in water forms **[1 mark]**
a) Carbon monoxide b)Carbonic acid
c)Hydrogen dioxide d) Carbonate of calcium

6) In a glass electrode the glass bulb is filled with **[1 mark]**
(a) 0.01 M HCI (b) 0.1 M HCI
(c) 1 M HCI (d) None of these

7) The reciprocal of resistance is called ---------- **[1 mark]**
a) Conductance b) Potential c) Current d) Cell constant

8) The conducting power of all ions produced by one mole of an electrolyte in 1 dm^3 of water is known as_____. **[1 mark]**
(a) Conductance (b) Equivalent conductance
(c) Molar conductance (d) Specific conductance

9) In potentiometric redox titration between Fe^{+2} and Ce^{+4}, at equivalence point----- **[1 mark]**
(a) [Fe^{+3}] and [Fe^{+2}] ions are present
(b)[Ce^{+3}] and [Fe^{+2}] ions are present
(c) [Ce^{+3}] and [Ce^{+4}] ions are present
(d) [Fe^{+3}] and [Ce^{+3}] ions are present

10) Maximum energy is required for transition of ---- **[1 mark]**
(a) $\sigma \rightarrow \sigma^*$ (b) $\pi \rightarrow \pi^*$ (c)n $\rightarrow \pi^*$ (d) n $\rightarrow \sigma^*$

11) The relation between the two terms Gross Calorific Value and Net Calorific Value can be explained as **[1 mark]**
(a) GCV=NCV (b) GCV>NCV
(c) GCV<NCV (d) GCV ≥ NCV

12) Cooling Correction during calculating GCV for Bomb Calorimeter should be _____ . **[1 mark]**
(a) Added (b) Multiplied
(c) Not considered (d)Subtracted

13) Knocking in diesel engine is because of _____ **[1 mark]**
(a) Ignition delay (b) No ignition
(c) Pre – ignition (d) None of above

14) Cetane number of _____ is 100 **[1 mark]**

(a) n – Heptane (b) Iso octane
(c) Hexadecane (d) 2 – methyl naphthalene

15) $C(s) + O_2 g) \rightarrow CO_2 (g)$ **[1 mark]**

In above reaction 12g C reacts with how many grams of O_2?

(a) 32 (b) 16 (c) 8 (d)64

16) Which of the following is not a monomer? **[1 mark]**

(a) Ethylene (b) glycol (c) styrene (d) ethyl alcohol

17) The minimum functionality of a monomer is_____ **[1 mark]**

(a) 1 (b) 2 (c) 3 (d) 4

18) Nylon is chemically, **[1 mark]**

(a) Polyamide (b) polyether
(c) polyester (d) none of these

19) Glass transition temperature of a vinylic polymer can be decreased by addition of, **[1 mark]**

(a) filler (b) plasticizer (c) stabilizer (d)pigment

20) The polymers that can be moulded and remoulded to get different shapes are **[1 mark]**

(a) thermoplastic polymers
(b) thermosoftening polymers
(c) cross linked polymers
(d) none of these