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

G.R. No.	

U18-105B (BE-FS)

DEC. 2018 / Backlog 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) Define Corrosion. Give any 2 factors affecting rate of dry corrosion. Write reaction of following metals with oxygen and identify types of oxide films formed. (i) Na (ii) Al (iii) Ag (iv) Mo **(6 marks)**

b) Explain any six factors affecting rate of corrosion **(6 marks)**

c) Explain the process of galvanisation with the help of diagram. **(4 marks)**

OR

Q.2) a) Explain wet corrosion with hydrogen evolution mechanism and oxygen absorption mechanism. **(6 marks)**

b) What is principle of cathodic protection? Explain sacrificial anodic and impressed current cathodic protection with figures. **(6 marks)**

c) What is cathodic and anodic coating? Which is more protective? Why? **(4 marks)**

Q.3) a) Give the construction, reactions during discharging and charging along with two applications of Lead-acid battery. **(6 marks)**

b) Define fuel cell. Give 2 advantages, 2 disadvantages and 2 applications of fuel cells **(4 marks)**

c) Mention any four outstanding features of lithium batteries in comparison with conventional batteries. **(4 marks)**

OR

Q.4) a) What are the different types of batteries? Describe construction with figure, working with reactions and 2 limitations of Zn-MnO_2 dry cell. **(6 marks)**

b) Write electrode reactions of Ni-Cd cell. Give any four applications of it. **(4 marks)**

c) Differentiate between polymer electrolyte membrane fuel cell (PEMFC) and solid oxide fuel cell (SOFC).(Give 4 points) **(4 marks)**

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

1) The color of Metal-EDTA complex is **(1 mark)**

a) Blue b) Wine red c) Pink d) Colorless

2) If P < 1/2 M, then alkalinity of water is due to ions **(1 mark)**

(a) OH^- (b) $HC0^{3-}$

(c) $C0_3^{-2}$ and $HC0_3^-$ (d) OH and $C0_3^{-2}$

3) Exhausted zeolite is regenerated by using **(1 mark)**

(a) Solution of sodium aluminate (b) Solution of sodium phosphate

(c) Solution of sodium chloride (d) Solution of sodium silicate

4) The process used to decrease concentration of salts in water by applying direct electric current is **(1 mark)**

(a) Ion exchange (b) Reverse osmosis

(c) Electrodialysis (d) Osmosis

5) To avoid caustic embrittlement, boiler feed water is treated with **(1 mark)**

(a) Sodium phosphate instead of sodium carbonate

(b) Sodium bicarbonate instead of sodium carbonate

(c) Sodium chloride instead of sodium carbonate

(d) Sodium sulphide instead of sodium carbonate

6) In potentiometric redox titration indicator electrode used is _____ **(1 mark)**

a)Calomel electrode b)Platinum electrode

c)Silver electrode d) Glass electrode

7) Cell constant is given by the factor _____ **(1 mark)**

a) a/l b) $a.l$

c) l/a d) $a^2.l$

8) The cell emf at equivalence point in the titration of Fe^{+2} versus Ce^{+4} is **(1 mark)**

(a) 0.11 V (b) 0.75 V (c) 1.45 V (d) 1.1 V

9) Glass electrode is an example of **(1 mark)**

(a) Indicator electrode (b) Primary electrode

(c) Redox electrode (d) None of these

10) Absorbance is related to transmittance as..... **(1 mark)**

(a) A = - ln T (b) A = - logT

(c) A = +logT (d) A = + ln T

11) A good fuel should have _____. **(1 mark)**

a) Moderate ignition temperature b) Cheap and ready availability

c) High calorific value d)All of the above

12) Biodiesel is obtained from vegetable oil or animal oil by a chemical reaction called _____. **(1 mark)**

(a) Fractional distillation (b) Emulsification

(c) Trans esterification (d) Biological fermentation

13) Addition of Ethyl Alcohol to petrol **(1 mark)**

a) Increases the octane no. b) Decreases the octane no.
c) Makes the combustion fast d) Increases knocking

14) To get more accurate results the corrections considered while calculating the calorific value of a fuel by Bomb calorimeter are **(1 mark)**
(a) Cooling Correction (b) Fuse Wire Correction
(c) Acid Correction (d) All of these

15) Octane number of _____ is arbitrarily zero. **(1 mark)**
(a) Isooctane (b) Hexadecane
(c) n-heptane (d) 2-methyl naphthalene

16) Crystallinity of LDPE is **(1 mark)**
(a) 90% (b) 40%
(c) 50% (d) 99%

17) Urea formaldehyde resin is an example of _____ resin **(1 mark)**
a) thermoplastic b) thermosetting
c) thermoelastic d) thermotropic

18) Bulk polymerization techniques uses **(1 mark)**
a) monomer dispersed in water
b) monomer dispersed in water with emulsifier
c)only monomer and initiator
d) monomer and initiator along with organic solvent

19) N – doping in conducting polymer is done by_____ **(1 mark)**
a) I_2 b) $FeCl_3$
c) Na d) Br_2

20) Kevlar is an example of _____ **(1 mark)**
a) biodegradable polymer b) conducting polymer
c) electroluminescent polymer d) liquid crystal polymer
