

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2015–16)

SUBJECT CODE: 15CH/AC/FC33

B.Sc. DEGREE EXAMINATION, NOVEMBER 2016
BRANCH III - PHYSICS
THIRD SEMESTER

REG.NO

COURSE : ALLIED CORE

PAPER : FUNDAMENTALS OF CHEMISTRY- I

TIME : 30 MINUTES

MAX.MARKS : 30

SECTION – A **(30x1=30)**
ANSWER ON THE QUESTION PAPER ITSELF

I. Choose the correct answer: **(10x1=10)**

- One of the polymer is thermosetting
a) Bakelite b) Polypropylene c) Nylon d) Polyethylene
- The initiator used in cationic polymerization reaction is
a) AlCl_3 b) Na/LiqNH_3 c) Grignard reagent d) Ziegler-Natta catalyst
- Which of the following is not a monosaccharide?
a) Glucose b) Cellulose c) Ribose d) Fructose
- One of the following is an acidic amino acid
a) Lysine b) Arginine c) Histidine d) Aspartic acid
- Weak base among the following is
a) HCl b) NH_4OH c) HF d) Acetic acid
- The conjugate base of HCl is
a) NaCl b) Cl_2 c) Cl^- d) OH^-
- The unit of specific conductance is
a) Sm^{-1} b) Sm c) Sm^2 d) Sm^{-2}
- Electrolytic conductance does not depend on
a) Nature of the electrolyte b) Mobility of ions c) Concentration d) Pressure
- A factor that affects the TGA curve is
a) Furnace temperature b) Weight of the sample c) Particle size d) All the above
- The quantity measured in DTA is
a) Mass b) Temperature difference c) Heat difference d) Volume

II. Fill in the blanks:

11. Poly aniline is an example of _____ polymer
12. The metal atom present in chlorophyll is _____.
13. Example for weak electrolyte is _____.
14. When starch is treated with iodine, _____ colour is produced.
15. Precipitation occurs when ionic product _____ solubility product.
16. An aqueous solution of a salt of weak base and strong acid is _____.
17. Oswald dilution law is based on _____ theory of electrolytes.
18. An example for strong electrolyte is _____.
19. The reference material used in DTA is _____.
20. Glass transition temperature can be determined by _____.

III. State whether the following are true or false:**(5x1=5)**

21. Polyester is a condensation polymer
22. Sucrose is a non reducing sugar.
23. Water is a very strong base.
24. Conductance of strong electrolytes is explained with Kohlrausch's law
25. A thermistor is used to sense temperature change in thermometric titrations.

IV. Answer in a line or two:**(5x1=5)**

26. What are conducting polymers?
27. Define isoelectric point.
28. What are buffer solutions?
29. What is meant by transport number?
30. What is a thermogram?

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TIME : 2 ½ HOURS

MAX.MARKS : 70

SECTION – B

ANSWER ANY FIVE QUESTIONS :

5X6=30

1. Explain the mechanism of free radical polymerization.
2. Give the structure and application of Nylon – 6.
3. Draw the Haworth structure of glucose and give any two colour tests to identify glucose.
4. What is common ion effect? Give any one application.
5. a) What is pH. Discuss the importance of pH scale. (4)
b) Calculate the pH of 0.0001 M HCl solution. (2)
6. Explain the principle of thermometric titration.
7. a) Explain the Ninhydrin reaction of aminoacids. (3)
b) How are carbohydrates classified? (3)

SECTION – C

2X20=40

ANSWER ANY TWO QUESTIONS:

8. a) Explain Arrhenius concept and Lowry-Bronsted concept of acids & basis. (7)
b) Discuss the conductometric titration of a strong acid Vs strong base (5)
c) What are buffer solutions with an example? Explain the action of a buffer solution of weak acid and its salt. (4)
d) State the Debye-Huckel Theory of strong electrolytes. (4)
9. a) Explain the formation of peptides and what is denaturation of proteins. (4+4)
b) The molar conductance of sodium acetate, hydrochloric acid and sodium chloride at infinite dilution are 91.0×10^{-4} , 426.16×10^{-4} and $126.5 \times 10^{-4} \text{ Sm}^2\text{mol}^{-1}$ respectively at 25°C. Calculate the mole conductance at infinite dilution for acetic acid.
c) Draw the structure and explain the biological role of haemoglobin (6)
10. a) What are the different types of liquid crystals? (4)
b) Write a note on biodegradable polymers. (5)
c) Explain the thermo gravimetric analysis of calcium oxalate monohydrate (5)
d) Give the instrumentation of DTA. (6)
