CLASS: B.Sc. CHEMISTRY **15A / 77**

St. JOSEPH'S COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002

SEMESTER EXAMINATIONS – APRIL 2015

TIME: 3 Hrs. **MAXIMUM MARKS: 100**

SEM	SET	PAPER CODE	TITLE OF THE PAPER
IV	2013	11UCH430206	GENERAL CHEMISTRY – IV

SECTION – A

Answer all the questions: **20 x 1 = 20**

Choose the correct answer:

1. Characteristic reactions of aromatic hydrocarbons are initiated by
   a) Electrophiles b) Nucelophiles
   c) Free radicals d) uncharged molecules
2. Ethylene glycol is
   a) monohydric alcohol b) dihydric alcohol
   c) trihydric alcohol d) polyhydric alcohol
3. Ethers are
   a) Lewis acids b) Neutral
   c) Lewis bases d) can not be predicted
4. $CaCO_3 \rightleftharpoons CaO + CO_2$
   a) one component system b) two component system
   c) three component system d) none of the above
5. The molecular formula for sodium carbonate
   a) $Na_2CO_3.10H_2O$ b) Na_2CO_3
   c) $Na_2CO_3.5H_2O$ d) $Na_2CO_3.7H_2O$

Fill in the blanks:

6. _____ catalyst is used to make benzene react with bromine to give bromobenzene.
7. Phenol $\xrightarrow{Br_2|H_2O}$ _____.
8. Ethers are stored in brown bottles. This is because on exposure to air and light ethers are converted into _____.
9. A solution of sugar in water is _____ phase system.
10. $MgSO_4.7H_2O$ shows the phenomenon of _____.

State True or False:

11. All carbon atoms in benzene are SP^3 hybridized.
12. Nitroglycerine is used in the manufacture of explosives.
13. Natural rubber is a polymer of 1,3–Butadiene.
14. Water ⇌ water vapour. This system has one degree of freedom.
15. Deliquescent substances are not soluble in water.

Match the following:

16. Gammexane - a) Cyclic polyethers
17. $CH_3CH_2.CHOH\ CH_3$ - b) Hexachloro cyclohexane
18. Crown ethers - c) $F = C – P + 2$
19. Gibb's phase rule - d) deliquescence
20. NaOH - e) Sec. butyl alcohol

SECTION – B

Answer all the questions: **5 x 4 = 20**

21. a. Give the mechanism of nitration of benzene.

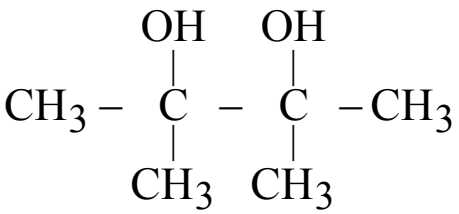
OR

b. Discuss the mechanism of Friedel crafts alkylation of benzene.

22. a. What are mercaptans? Indicate a method for converting mercaptan into sulphonal. (2+2=4)

OR

b. What do you expect when the following substance is treated with an acid catalyst? Explain the mechanism:



23. a. How will you prepare the following compounds from diethyl ether? (a) Ethyl chloride (b) ethanol (2+2=4)

OR

b. Write a note on vulcanization of rubber.

24. a. Sketch and explain the phase diagram of CO_2 system.

OR

b. Apply phase rule to sulphur system using a labelled phase diagram.

25. a. Draw and explain the phase diagram of Bi – Cd system.

OR

b. Explain the phase diagram of a two component system with an incongruent melting point.

SECTION – C

Answer any FOUR questions: **4 x 15 = 60**

26. i. How will you synthesize the following compounds from benzene? (5×2=10)
    (a) Acetophenone (b) Chlorobenzene (c) benzophenone
    (d) benzene hexa chloride (e) benzene sulphonic acid
    ii. What is Huckell's rule? Write the structure of two compounds that follow this rule: (2+3=5)
27. i. Give any five methods of preparation of alcohols. (6)
    ii. How will you convert (4)
    (a) propylene into glycerol
    (b) Glycerol into allyl alcohol
    iii. Name the reagent and reaction conditions for the preparation of following from phenol.
    (a) Salicylic acid (b) P-hydroxy acetophenone (5)
28. i. How will you prepare sulphone from thio ethers. (3)
    ii. Discuss the mechanism for the polymerisation of ethylene in the presence of an organic peroxide as catalyst. (10)
    iii. Give the difference between thermosetting and thermoplastic polymer. (2)
29. i. Give the equation for the reduced phase rule. (2)
    ii. Draw the phase diagram for water system and explain. (8)
    iii. Derive Gibb's Phase rule. (5)
30. i. Sketch and explain the phase diagram of $FeCl_3 – H_2O$ system.
    ii. What is meant by congruently melting compounds? Explain with Mg – Zn system. (6+9)

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