[76] No. of printed pages: 3+2

SARDAR PATEL UNIVERSITY
T. Y. B.Sc. (V SEM.) (CBCS) EXAMINATION
Monday, 26th November 2012
2.30 pm - 5.30 pm
US05CCHE01 : Organic Chemistry

Total Marks: 70

Note: Figures to the right indicate full marks.

Q.1 Choose the correct option for the following. [10]

(1) Which of the following reagent will react with pyrrole to give 2-formylpyrrole?
(a) HCOOH (b) H_2O_2
(c) $CHCl_3$/KOH (d) H_2SO_4

(2) Pyridine reacts with a mixture of KNO_3 and H_2SO_4 at 300°C to give _____.
(a) 1-nitropyridine (b) 2-nitropyridine
(c) 3-nitropyridine (d) 4-nitropyridine

(3) Which of the following is not a six membered heterocycle?
(a) Pyridine (b) Piperidine
(c) Picoline (d) Furan

(4) γ effect is always _____.
(a) positive (b) negative
(c) either (a) or (b) (d) None of them.

(5) Which area of the IR spectrum is called the "finger print region"?
(a) 2000-1000 cm^{-1} (b) 2000-400 cm^{-1}
(c) 3000-1000 cm^{-1} (d) 1460-600 cm^{-1}

(6) How many NMR signals are possible for chloroethene?
(a) 1 (b) 2
(c) 3 (d) 4

(7) Which one is a more stable diene?
(a) 1,4-Pentadiene (b) alkene
(c) 1,3-butadiene (d) 1,2-butadiene

(8) Polymer prepared from single monomer is known as _____.
(a) Co-polymer (b) Homo polymer
(c) Hetero polymer (d) Cross-linked polymer

(9) Which of the following insecticides is transmitted into human body through cow's milk?
(a) Baygon (b) D.D.T.
(c) B.H.C. (d) Ferbum

(10) _____ is the detergent of imidazole class.
(a) Tinopal RBX (b) Igepon-T
(c) Miranol C_2M (d) None

Q.2 Answer the following. **(Any Ten)** [20]

(1) Pyrrolidine is a stronger base than pyrrole. Explain.
(2) Explain: Chichibabin reaction
(3) Complete and rewrite the following reactions
(i) Furan $\underline{H_2SO_4}$ (?) (ii) Pyridine $\underline{H_2SO_4}$ (?)
(4) Differentiate between shielded and deshielded protons.
(5) Give various aspects of CMR spectrum.
(6) Explain the following terms with suitable example.
(a) enantiotopic proton (b) Diastereotopic proton.
(7) Define diene and give its classification with example.
(8) Differentiate between Plastics and Resin.
(9) Give synthesis of vulcanized rubber.
(10) What is fixative? Explain the functions of fixative.
(11) Give synthesis of Miranol C_2M.
(12) Give the advantages of organophosphorus insecticides.

Q.3

(A) Discuss Skraup's synthesis for the preparation of quinoline. [04]
(B) Answer the following
(i) Give synthesis of β-cyanopyridine from β-picoline. [03]
(ii) Pyrrole on nitration gives 2-Nitropyrrole and not 3-notropyrrole. Explain. [03]

OR

Q.3

(A) Discuss Bischler-Napieralski synthesis for the preparation of isoquinoline. [04]
(B) Answer the following
(i) Why electrophilic substitution reaction occurs chiefly at 3-position and not at 2-position in pyridine? [03]
(ii) Discuss structure of pyridine. [03]

Q.4

(A) Give various aspects of NMR spectrum. [03]
(B) Give the structure consistent with the following data and explain your answer.
(i) Molecular formula: $C_3H_5F_2Cl$ [03]
NMR (δ ppm) : a) triplet, 3H, 1.75
b) triplet, 2H, 3.63
(ii) Molecular formula: $C_{10}H_{12}O$ [04]
IR (cm^{-1}): 3100, 3000, 2950, 2900, 1670, 1620, 1370, 1385, 750
NMR (δ ppm) : a) Doublet, 6H, 1.25
b) Multiplet, 1H, 3.47
c) Singlet, 5H, 7.67

OR

Q.4

(A) Discuss spliting of NMR signal by spin-spin coupling. [04]
(B) Answer the following
(i) How will you differentiate geometric isomers by using CMR spectroscopy? [03]
(ii) Draw all possible isomers for the formula C_6H_{14} and tell how many CMR signals do you expect from each of the isomers? [03]

Q.5

(A) Define the term Copolymerization and give the classification of copolymer in detail. [04]

(B) Answer the following

(i) Differentiate between fibre and elastomer. [03]

(ii) Define hyperconjugation by taking suitable example. [03]

OR

Q.5

(A) Give advantages of coordination polymerization over free radical polymerization. [03]

(B) Explain 1,2-and 1,4-addition in conjugated diene and conclude why 1,4-addition product is a major product? [04]

(C) Give the mechanism of free radical polymerization of acrylonitrile. [03]

Q.6 Define detergent and compare detergent with soap. Give principle of cleaning action of detergent also give synthesis of Tinopal RBX detergent. [10]

OR

Q.6 Give synthesis and application for the following compounds. [10]

(i) DDT

(ii) Coumarin

(iii) Igepon-T

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