This question paper contains 2 printed pages

Q.P.NO.5104-A

Your Roll No.....

B

B.Sc. (Prog.)/II
CH-302-CHEMISTRY
(Organic and Physical Chemistry)

SECTION-A

Time: 3.00 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper)

Question No.2 is compulsory and carries 14 marks and attempt three more questions from the rest. Q.No.1,3,4 and 5 carry 12 marks each

Q.No.1

a) How was the structure of Naphthalene established?
b) What happens, when naphthalene is treated with a kaline $KMnO_4$ solution. (10,2)

Q.No.2

a) How to convert an Aldopentose to a Ketohexose.
b) Write the structure of starch.
c) What happens when fructose is treated with Conc Nitric acid. (8,2,4)

Q.No.3

a) Explain with example the 'Anionic-Mechanism during polymerization of the olefimc compounds.
b) How is NyLon 6.6 prepared? (6,6)

Q.No.4

a) Write a note on 'Essential Amino Acids'.
b) Using N-Protecting agent synthesise the dipeptide Ala-gly. (6,6)

Q.No.5

a) Give the structure of Atropine and its uses.
b) What are "Chromospheres and Auxochromes' Explain with examples.
c) Which region of the IR Spectrum is referred to as the finger print region? Why is it called finger print region and what information can be obtained from it? (3,5,4)

SECTION-B

Attempt any two questions. All questions carry equal marks, Log table/simple calculator may be used

Q.No.1

a) Write the time-independent schrodinger's wave equation for a particle confined to move in one dirction. What is its significance? (3)

b) Explain/give reasons

i) Zero point energy is not zero but have some finite value, Comment.
ii) Under what conditions, the wave function is said to be an acceptable wave function?
iii) Why is there a need to convert Cartesian coordinates into polar coordinates? (2,2,2)

c) For a diatomic molecule, show that the moment of inertia $I=\mu r^2$ (3 ½)

Q.No.2

a) Discuss the effect of isotopic substitution on rotational spectra (4)
b) What is 'Rule of Mutual Exclusion'. Explain with suitable examples. (3 ½)
c) If Hcl ^{35} is irradiated with 435.8 nm Hg line, calculate the Raman stokes and Raman Anti strokes lines in nm if the fundamental vibrational frequency of Hcl ^{35} is 8.667×10^{13} sec^{-1} (5)

Q.No.3

a) How does the adsorption of a gas on a solid change with pressure? Explain with the help of a diagram. (3 ½)
b) Draw the typical absorption isotherms obtained in case of monolayer and multilayer adsorption. (3)
c) Write short notes on the following: (any two)

i) Applications of adsorption
ii) Adsorption isotherm and isobar
iii) BET equation (3,3)

Q.No.4(a) Explain the following : (any two)

i) Copolymers
ii) Viscosity method
iii) Conducting Polymers (2 ½,2 ½)

b) Describe the characteristics of polymers. (5)
c) What is Vulcanisation and what is its use (2 ½)

Physical consultants

$c = 3 \times 10^{10}$ cm sec^{-1}
$\pi = 3.14$
$h = 6.626 \times 10^{-27}$ ergs sec
$m_e = 9.11 \times 10^{-28}$ g