



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCE

DEPARTMENT OF APPLIED CHEMISTRY

INDUSTRIAL ORGANIC CHEMISTRY III
SCH 4215

FOR SCH STUDENTS ONLY

Supplementary Examination Paper

JULY 2016

This examination paper consists of 4 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: NONE

Examiner's Name: DR C T PAREKH

INSTRUCTIONS

1. Answer all questions from Section A and any three from Section B. Section A carries 40 marks and each question in Section B carries 20 marks.
2. Show mechanism, chemical steps or synthesis by means of curved arrows.

MARK ALLOCATION

QUESTION	MARKS
1.	40
2.	20
3.	20
4.	20
5.	20
TOTAL	100

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SECTION A:

1. (a) Draw the structures for the following compounds.
(i) Sunset yellow
(ii) Nylon 6,6 (4 Marks)
- (b) Define antibiotics? (2 Marks)
- (c) Give the therapeutic class of each of the following drugs: (do not repeat the class)
(i) ibuprofen (ii) sulphanilamide (iii) taxol
(iv) phenobarbital (v) aspirin (vi) LSD (6 Marks)
- (d) What is the difference between narcotics and non-narcotics? (4 Marks)
- (e) What do you understand by the term bioavailability? (3 Marks)
- (f) What do you understand by "*first pass effect*"? (4 Marks)
- (g) Why is β -naphthol and not 2-naphthyl amine used to manufacture Amino J-acid? (3 Marks)
- (h) Indicate the differences between virus and bacteria. (6 Marks)
- (i) Write reaction mechanism (use curved arrows) of a diazo coupling reaction between phenol and aniline (phenyl amine). Indicate reagents and reaction conditions. (6 Marks)
- (j) What is the difference between dyes and pigments? (2 Marks)

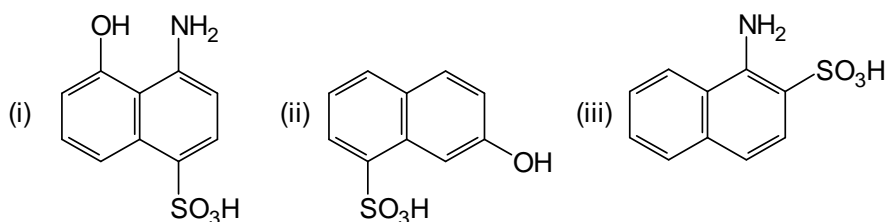
SECTION B:

2. (a) Describe the manufacture of citric acid by fermentation and suggest three main uses of it. (10 Marks)
- (b) Draw the labelled schematic diagram for the manufacture of LDPE. (10 Marks)
3. (a) There are two alkaloids namely vincristine and vinblastine among other alkaloids extracted from a plant which are used in the treatment of cancer.
(i) Give the botanical name and the common name of the plant.
(ii) Draw the chemical structure of any one of the alkaloids. (2+4 Marks)

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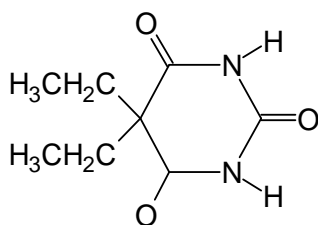
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- (b) Suggest at least two methods for the synthesis of phthalic anhydride. Use reagents of your choice. (5 Marks)
- (c) Hormones are secreted by ductless glands called endocrine glands. Give name of one of the ductless glands, name the hormones it secretes and the hormone's function in the body. (4 Marks)
- (d) State condition(s) and indicate the position by an arrow where the following intermediates couple during dye manufacturing. Also indicate wherever possible where the first coupling will take place.



(5 Marks)

4. (a) Outline the synthesis of barbital, from diethylmalonate. Use reagents such as sodium ethoxide, chloroethane, urea etc.

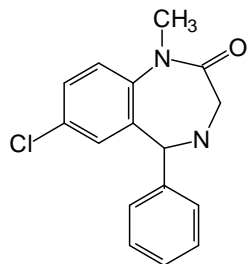


barbital

(10 Marks)

- (b) Draw the structure of oseltamivir phosphate known as Tamiflu which is prescribed for swine flu. (4 Marks)
- (c) Draw the structure of zanamivir known as relenza, also prescribed for swine flu. How this drug was discovered? (6 Marks)

5. (a) Outline the synthesis of valium (diazepam) which is used as an anti-anxiety and sedative (tranquilliser) drug from p-chloroaniline and benzoyl chloride. Use reagents such as zinc chloride, amino ester, dimethyl sulphate, and any other reagents you may need.



valium

(10 Marks)

- (b) You are given 1-amino-8-naphthol-4-sulphonic acid (S-acid), 4-aminobenzene sulphonic acid (sulphanilic acid), 1-naphthyl amine, acidic solution and alkaline solution. Draw the structure of the unknown dye step by step with coupling conditions. Indicate the Winther's formula for it. (10 Marks)

End of question Paper!!!

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