



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
END OF SEMESTER TWO EXAMINATIONS – MAY 2005
INDUSTRIAL ORGANIC CHEMISTRY I – SCH 2215
TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

Answer **ANY FIVE (5)** questions from the six (6) provided. Each question carries 20 marks.

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1. Briefly explain the manufacturing procedures of the following products from coal:
 - (a) Pitch
 - (b) Ammonium Sulphate
 - (c) Benzol
 - (d) Naphthalene
 - (e) Fuel gas(20 marks)

 2. You are a Chemist at Wankie Colliery Company. Upon analysis of the fuel gas from the coke oven batteries you notice a sudden upsurge in the concentration of CH_4 and homologs and a sharp drop in H_2 content.
 - (a) What do you think is going wrong? (4 marks)
 - (b) Advise the Plant Manager of the steps to be taken to correct the situation. (8 marks)
 - (c) Show the composition of the gas expected from a properly functioning oven producing high quality metallurgical coke. (8 marks)

 3. A Pulp and Paper Manufacturing Company, U & I Paper Industries, has decided to improve the quality of its paper for Royal Airlines. Consequently the Company has instituted a project to convert its Sulphate (Kraft) Manufacturing Plant to the sulphite process.
 - (a) Indicate the process changes necessary to ensure the success of the project. (10 marks)
 - (b) Draw the process flow charts for liquor treatment in both processes. (10 marks)

 4. (a) Compare and contrast the manufacturing processes of Ammonium Nitrate and Nitroglycerin. (10 marks)

4. (b) A mine wishes to purchase explosives to blast a quarry to extract limestone. Advise, giving reasons which explosive to use between ammonium nitrate and nitroglycerin. (10 marks)
5. Write short notes on the following explosives:
- (a) RDX
 - (b) Picrate
 - (c) TNT
 - (d) PBX
 - (e) Lead Azide (20 marks)
6. (a) What are *mordant dyes*? (5 marks)
- (b) Describe the manufacture of one mordant dye that you know. (10 marks)
- (c) Write the coupling reaction of the *indigo dye*. (5 marks)

End of question Paper!!!