BITS, PILANI – DUBAI CAMPUS

SECOND SEMESTER 2013 – 2014

THIRD YEAR CHEM ENGG COMPREHENSIVE EXAMINATION(Closed Book)

Course Code:CHE F419 Date: 22.5.2014
Course Title:Chemical Process Tech Max Marks:40
Duration : 3 hours Weightage: 40%

1.(i) What is an electrostatic precipitator? Where is it generally used?
(ii) Describe briefly the method of sulfur production by oxidation-reduction of hydrogen sulphide with a neat flow chart.
(iii) DCDA process used in the production of sulphuric acid is superior to contact process. Justify.
(iv) Discuss the details of ammonia oxidation to nitric oxide (first stage of nitric acid production) with the help of a diagram of the converter.
(v) Write any two major engineering problems faced in the manufacture of producer gas.

(1+2+1+2+1M)

2. (i) Explain the manufacture of coke oven gas with a neat flow chart.
(ii) How is raw NG purified?
(iii) Discuss the production of ammonium nitrate by prilling process with relevant raw materials, chemical reaction, process description and diagram.
(iv) Write all the chemical equations involved in the production of phosphoric acid by strong acid process.
(v) Schematically represent the paper making process.

(2+2+2.5+1.5+1M)

3. (i) Explain the limestone benefication process with a neat flow chart.
(ii) What is meant by hydrogenation of oils? Describe the production of vanaspati with relevant flow chart.
(iii) Explain the cleansing action of soap . Give one example for an anionic detergent.
(iv) Describe the lurgi process used for coal gasification with a neat diagram.
(v) What is meant by the term contact finishing used in the refinery operations of crude oil? Write any one major catalytic reforming reaction.

(2+2+1.5+1.5+2M)

4.(i) Explain the production of methanol via synthesis gas route.
(ii) Write all the chemical reactions involved in the production of isoprene from propylene.
(iii) List any one intermediate produced from ethylene and give its use.
(iv) Give the chemical reactions involved in the butanol production by oxo process. Write any one unit operation involved in the process.
(v) Describe any two polycondensation process with suitable examples.

(2+1.5+1+2+2M)

5.(i) Write the chemical equations involved in the preparation of polyester and 6,6 -Nylon .
(ii) Draw and label a bioreactor used in the production of penicillin with all its sensors.
(iii) Write a note on the purification step involved in the penicillin production by fermentation process.
(iv) Write the undesirable side reaction taking place in the production of urea from ammonium carbamate.
(v) Write any two major engineering problems faced in the manufacture of portland cement.

(2+1+1.5+1+1M)

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SECOND SEMESTER 2013 – 2014

THIRD YEAR CHEM ENGG TEST-2 (OPEN BOOK)

Course Code:CHE F419 Date: 10.4.2014
Course Title:Chemical Process Technology Max Marks:20
Duration : 50 minutes Weightage: 20%

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1. (i) Write the significance of iodine number.
   (ii)A farm has a rich source of olive around the Mediterranean. Discuss the various chemical processes involved in getting a variety of products from the above source (include diagrams wherever necessary). **[1+4M]**

2. (i) What is meant by the term benefication? Explain its significance in the production of triple superphosphate.
   (ii)Draw the flow chart for the manufacture of glycerin by continuous process. **[3+1M]**

3. (i) How are soaps and detergents chemically alike and different ? How are they derived?
   (ii)Mention the role of zeolites added as phosphorus free builders in the manufacture of detergents. **[3+1M]**

4. (i) Write any two limitations of sulfite pulp process.
   (ii) How does the paper manufacturing processes contribute to air pollution? **[2+2M]**

5. (i)What is meant by soundness in cement?
   (ii)Gypsum is added to reduce the quick setting of cement. Justify. **[1+2M]**

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SECOND SEMESTER 2013 – 2014

THIRD YEAR CHEM ENGG TEST-1 (CLOSED BOOK)

Course Code:CHE F419 Date: 27.2.2014
Course Title:Chemical Process Technology Max Marks:20
Duration : 50 minutes Weightage: 20%

1.Discuss the elemental sulfur mining by Frasch process with a neat flow chart . **(4M)**

2. Indicate the schematic representation and comments for the unit operations given below **(3M)**

(i)Cyclone separator (ii) Screw conveyor

3. Write any two engineering problems faced in water gas manufacturing processes. **(1M)**

4. Give all the chemical reactions involved in the lead chamber process of manufacture of sulphuric acid. **(2M)**

5. Describe briefly the manufacture of sulphuric acid by contact process with a neat flow chart. **(3M)**

6. What is meant by 25% oleum? Give the composition of producer gas ? **(2M)**

7. Explain in detail any two unit operations involved in the manufacture of coke oven gas. **(2M)**

8. Explain how natural gas is purified during the treatment processes with the help of the relevant diagram. **(3M)**

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SECOND SEMESTER 2013 – 2014

Course Code:CHE F419 **THIRD YEAR CHEM ENGG** Date: 8.05.2014

Course Title:Chemical Process Tech QUIZ-2 Max Marks:10

Duration : 20 minutes Weightage: 10%

Name: ..... **ID No:** ..... **Sec / Prog:** .....

Instructions: (if any) Over writing will be taken as wrong answer

1. What is meant by hydrotreating that is used in crude oil refining processes? Give an example. **(2M)**

2. Mention the temperature and catalyst used in the fluidized bed type catalytic cracking process. **(1M)**

3. Write the approximate equation representing the chemical reaction for the coking of coal. **(1M)**

4. Write any two major engineering problems faced in the gasification of coal. **(1M)**

5. Give any one of the chemicals obtained from propylene along with the use. **(1M)**

6. Why do we use copper lined thick-walled pressure vessels in the synthesis of methanol. **(1M)**

7. What is meant by Rochow process? **(1M)**

8. Write the chemical equation for the synthesis of (a) Vinyl chloride (b) Butadiene. **(2M)**

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SECOND SEMESTER 2013 – 2014

Course Code:CHE F419 **THIRD YEAR CHEM ENGG** Date: 20.3.2014

Course Title:Chemical Process Technology Max Marks:10

Duration : 20 minutes Weightage: 10%

Name: . . . . . **ID No:** . . . . . **Sec / Prog:** . . . . . .

Instructions: (if any) Over writing will be taken as wrong answer

1. Mention any two processes used for concentration of the nitric acid to 95%. **(1M)**

2. Write the basic equations governing the SCR unit in the manufacture of nitric acid. **(1M)**

3. What does the converter section consists of in the manufacture of nitric acid by ammonia-oxidation process ? **(2M)**

4. What is the side product formed during prilling in the manufacture of urea ? How can it be prevented ? **(1M)**

5. Give the major use of ammonium nitrate with a suitable reason. **(1M)**

6. Write the chemical reaction involved and any 2 unit operations carried out in the production of phosphoric acid by strong acid process. **(2M)**

7. Name the modern urea process which operates by carbondioxide stripping. **(1M)**

8. Write the major engineering problem that arises due to the temperature in the production of phosphoric acid. **(1M)**

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