

BITS, PILANI – DUBAI CAMPUS

SECOND SEMESTER 2011 – 2012

THIRD YEAR CHEM ENGG COMPREHENSIVE EXAMINATION

Course Code: CHE C322

Date: 10.6.2012

Course Title: Chemical Process Technology

Max Marks: 40

Duration : 3 hours

Weightage: 40%

- 1.(i) Indicate the schematic representation and comments for the unit operations given below
(a) Tunnel drier (b) Cyclone separator
- (ii) Write any 2 major engineering problems faced in elemental sulfur mining by Frasch process.
- (iii) Give the major overall reactions (chemical equations) involved in the lead chamber process of manufacture of sulfuric acid .
- (iv) Discuss briefly the production of urea from ammonium carbamate with a neat flow chart.
- (v) Mention all the basic equations governing the SCR process in the manufacture of nitric acid.

(2+1+2+3+1M)

- 2.(i) Differentiate between the blow cycle and run cycle in the manufacture of carburetted water gas.
- (ii) When do we call NG as sour gas ? How will you rectify it ?
- (iii) Draw the flow chart for the manufacture of super phosphate. Write the chemical reactions involved in this process.
- (iv) Schematically represent the paper making process. Write the role of sizing in paper making.
- (v) Explain the process of Portland cement manufacture with a neat flow chart . Write the chemical reactions involved and give the consequence in case if silica is present in excess .

(2+1+2+2+3.5M)

- 3.(i) How will you prepare synthetic glycerin from propylene via allyl chloride?
- (ii) Explain Alfol process through chemical equations and appropriate reaction conditions.
- (iii) Describe the coal gasification process with a neat diagram.
- (iv) Mention the different forms of fuel produced from coal.
- (v) Give any 2 advantages of catalytic cracking over thermal cracking.

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

4. (i) Write the chemical reactions taking place when methane is subjected to chlorination.
(ii) Write a note on solvent dewaxing (one of the refinery operations of crude oil).
(iii) List any 2 chemical intermediates produced from butylene and give their uses.
(iv) Explain in detail the preparation of vinyl chloride via ethylene dichloride with a neat flow chart.
(v) What is meant by oxo process? Write the chemical reactions involved in it.

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

5. (i) How is 6,6 - nylon synthesized? Describe the process using an appropriate flow chart.
(ii) Give any 2 examples of stereospecific agents used in the polymerization process.
(iii) Draw and label a bioreactor used in the production of penicillin with all the sensors.
(iv) Write any two major drug categories (other than antibiotics) and give an example of each.
(v) How will you prepare the fermentation medium in the penicillin drug production?

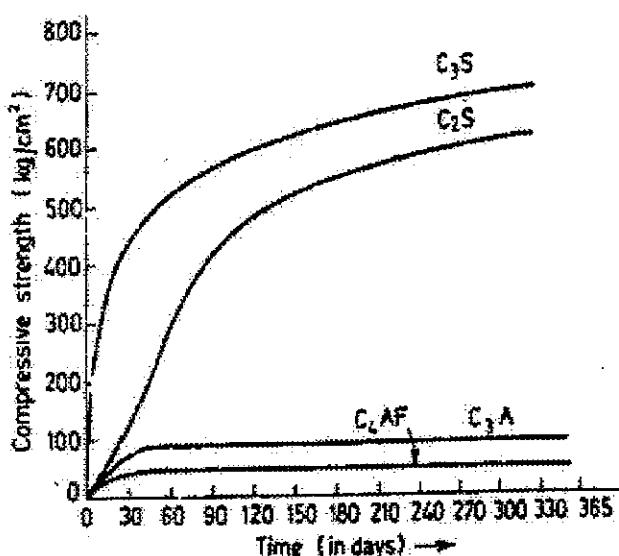
(2+1+1+1+1M)

BITS, PILANI – DUBAI CAMPUS
SECOND SEMESTER 2011 – 2012
THIRD YEAR CHEM ENGG TEST-2 (OPEN BOOK)

Course Code: CHE C322
 Course Title: Chemical Process Technology
 Duration : 50 minutes

Date: 6.5.2012
 Max Marks: 20
 Weightage: 20%

1. (i). Give the reason for the setting and hardening of cement.
 (ii) In the graph given below indicate the compound with lowest and highest strength with appropriate reasons.



- (iii) In the limestone beneficiation of cement manufacture, mention the types of flotation cells along with their functions. [2+2+2M]
2. (i) Draw the flow chart for the manufacture of soap by continuous process.
 (ii) How do soaps and detergents differ in their composition. Discuss by giving an example for each.
 (iii) Which are the two methods for getting oil from seeds? [1+3+1M]
3. A farm has a rich source of soyabeans. Discuss the various chemical processes involved in getting a variety of products from the above raw material. (include diagrams wherever necessary). [4M]
4. (i) Explain in detail the sulfite process with relevant chemical equations. Mention any two demerits of this process.
 (ii) Which substance is added during paper production to increase the softness of finished Paper? [4+1M]

BITS, PILANI – DUBAI CAMPUS

SECOND SEMESTER 2011 – 2012

THIRD YEAR CHEM ENGG TEST-1 (CLOSED BOOK)

Course Code: CHE C322

Date: 18.3.2012

Course Title: Chemical Process Technology

Max Marks: 25

Duration : 50 minutes

Weightage: 25%

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1. What is the composition of LPG? Write any two engineering problems faced in water gas manufacturing process. **(1+ 2M)**
 2. Discuss the production of coke oven gas plus derived ammonia synthesis gas with a neat flow sheet. **(6M)**
 3. Discuss the details of Ammonia oxidation (1st stage of nitric acid production) with the help of a diagram of the tube converter. **(4M)**
 4. How is raw NG purified ? **(4M)**
 5. What is the by product in urea prilling operation. How can it be minimized? **(2M)**
 6. Mention the technique used for high strength nitric acid production from weak nitric acid. Write the principle involved in it. **(3M)**
 7. Describe briefly the pool reactor of urea plants with a neat diagram. **(3M)**

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SECOND SEMESTER 2011 – 2012

Course Code:CHE C322

THIRD YEAR CHEM ENGG

Date: 17.4.2012

Course Title:Chemical Process Technology

QUIZ-2 (closed book)

Max Marks:14

Duration : 20 minutes

Weightage: 7%

Name: ID No: Sec / Prog:

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

1. Write the major use of ammonium nitrate with a suitable reason for your answer. **(2M)**

2. List the raw materials used for the production of ammonium nitrate. **(2M)**

3. How does super phosphate fertilizer differ from triple superphosphate ? **(2M)**

4. Write the material of construction used in the storage tanks and reaction tanks in the production of phosphoric acid. **(2M)**

5. Write the chemical formula and name of the fertilizer obtained when phosphoric acid is treated with (i) ammonia (ii) phosphate rock (2M)

6. Mention the different operations (any 4) involved in the beneficiation process used on low grade ore in the production of orthophosphoric acid by wet process. (2M)

7. Write any two unit operations carried out in the production of triple super phosphate. (2M)

BITS, PILANI – DUBAI CAMPUS
SECOND SEMESTER 2011 – 2012

Course Code: CHE C322

THIRD YEAR CHEM ENGG

Date: 28.2.2012

Course Title: Chemical Process Technology

Max Marks: 16

Duration : 20 minutes

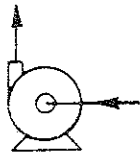
Weightage: 8%

Name: ID No: Sec / Prog:

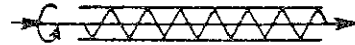
Instructions: (if any) Over writing will be taken as wrong answer

1. Identify the schematic representation and write the name of the unit operation. (2M)

(i)



(ii)



2. What is 20% oleum? (2M)

(2M)

3. Give any 2 major engineering problems faced while producing sulfur by oxidation-reduction of hydrogen sulphide. (2M)

(2M)

4. Write the relevant chemical equations for the reaction of SO_3 once it is formed from SO_2 in the manufacture of sulphuric acid by contact process. (2M)

(2M)

5. Give the important economic consideration in the operation of a chamber process plant in the manufacture of sulphuric acid. **(2M)**
6. Give any 2 reasons for the replacement of Pt catalyst by V_2O_5 in the manufacture of sulphuric acid by contact process. **(2M)**
7. Which property of sulfur is utilized in its extraction by Frasch process? **(2M)**
8. DCDA process in the production of sulphuric acid is superior to contact process. Justify. **(2M)**
