



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 60

Max Time: 3 Hrs

Weightage: 30 %

Set B

COMPREHENSIVE EXAMINATION

I Semester 2016 - 2017

Course: CHE A 103 Engineering Chemistry

12th January 2017

Instructions:

- i. Closed book exam comprises of Parts A, B, C and open book exam involves only Part D
- ii. Separate answer booklet must be used for open book examination.
- iii. Only prescribed text book is permitted for open book examination.

Part A

Answer the following questions

(5 Q x 3M= 15Marks)

1. Give the composition of the following: Natural gas, LPG.
2. Classify the polymer on the basis of structure.
3. How does Buna S rubber different from Buna N rubber?
4. What are refractories? List any two characteristics of a good refractory.
5. Define equivalence point and end point of a titration.

Part B

Answer the following questions

(1Q x 10 M= 10 Marks)

- 6(a) Explain the construction and cell reactions of Lead-acid battery (5M)
- (b) Describe the coking process by bee-hive oven method with diagram (5M)

Part C

Answer the following questions

(1 Q x 15 M= 15 Marks)

- 7(a) Calculate the total hardness, temporary hardness and permanent hardness of a water sample containing:

$\text{Ca}(\text{HCO}_3)_2=10.2$ ppm, $\text{Mg}(\text{HCO}_3)_2=5.3$ ppm, $\text{CaCl}_2=21.2$ ppm $\text{CaSO}_4=12.5$ ppm, $\text{MgSO}_4=5.5$ ppm,

$\text{MgCl}_2=15.6$ ppm. Express the hardness in degree French.

(8M)

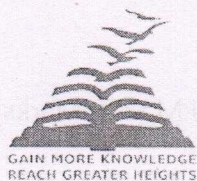
(Atomic Weights: Ca:40, Mg: 24, H: 1, C: 12, O:16, S: 32, Cl: 35.5, N: 14)

- (b) Explain the stages involved in the manufacture of Portland cement (with appropriate reactions) (7M)

Part D (Open book)

(1Q x 20 M = 20 Marks)

- 8(a) Phenol and formaldehyde undergo condensation to give a polymer (A) which on heating with a base (B) gives a thermosetting polymer (C) which is used in making switches, cooker handles etc. Identify A, B and C. Write the reaction involved in the formation of A and B. **(10M)**
- (b) Explain the determination of content of carbon, hydrogen, nitrogen, sulphur and ash content present in a coal sample. **(10M)**



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Course: CHE A 103 Engineering Chemistry

12th January 2017

Instructions:

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Part A

Answer the following questions

(5 Q x 3M= 15Marks)

- Define calorific value of a fuel. Mention its types.
- What are adhesives? Give examples.
- What is the function of an indicator in titration? List the types of indicators.
- Differentiate between primary and secondary batteries with one example each.
- What is meant by sacrificial anode coating?

Part B

Answer the following questions

(1 Q x 10 M= 10 Marks)

- 6(a) Explain the synthesis and any two applications of Nylon 6,6 **(5M)**
- (b) Describe the process of desalination of water by electro dialysis with a schematic diagram **(5M)**

Part C

Answer the following questions

(1 Q x 15 M= 15 Marks)

- 7(a) Calculate the total hardness, temporary hardness and permanent hardness of a water sample containing the following: $\text{Mg}(\text{HCO}_3)_2$: 25.5 mg/L ; MgSO_4 : 14.7 mg/L ; MgCl_2 : 19.8 mg/L ; CaSO_4 : 30.5 mg/L; $\text{Ca}(\text{HCO}_3)_2$: 42.2 mg/L. Express the hardness in ppm **(8M)**
- (Atomic Weights: Ca:40, Mg: 24, H: 1, C: 12, O:16, S: 32, Cl: 35.5, N: 14)
- (b) Explain the fractional distillation of crude oil with a diagram **(7M)**

Part D (Open book)

(1Q x 20 M = 20 Marks)

8(a) Justify the following

- COD is higher than BOD
- Chloramine is a better disinfectant than chlorine and bleaching powder (appropriate reactions required)
- Sedimentation with coagulation is a better process than sedimentation alone **(10M)**

(b) What do you mean by moulding of plastics? Discuss the moulding technique used to manufacture the following articles:

- (i) Cooker handles
- (ii) Soft drink bottles **(10M)**



PRESIDENCY UNIVERSITY, BENGALURU
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Max Marks: 50

Max Time: 50 Mins

Weightage: 25 %

Set A

MID TERM EXAMINATION

MAKE-UP

I Semester 2016 -2017 Course: CHE A 103 Engineering Chemistry /
CHE A 101

18th October 2016

Instructions:

- i. Write legibly
- ii. Scientific and non programmable calculators are permitted

Part A

Answer the following questions

(5Q x 3M= 15Marks)

1. Define Unit Cell.
2. List any three commercially important synthetic rubbers.
3. Mention the types of packing in solids in two dimension.
4. Write the functionality of the following monomers:
(a) ethylene (b) Phenol
5. Name two types of ion exchange resins used in water softening.

Part B

Answer the following questions

(5Q x 5M= 25 Marks)

1. Distinguish between addition and condensation polymerization.
2. Mention the types of defects in a crystal. How is Frenkel defect different from Schotky defect?
3. Explain the synthesis of Bakelite with a chemical equation and list any two of its applications.
4. Discuss N-type and P-type semiconductor.
5. Describe the structure of graphite.

Part C

Answer the following questions

(1Q x 10M= 10 Marks)

1. Discuss the various steps involved in the free radical polymerization mechanism with a suitable example.