GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

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: $Ca(HCO_3)_2$=10.2 ppm, $Mg(HCO_3)_2$=5.3ppm, $CaCl_2$=21.2ppm $CaSO_4$=12.5ppm, $MgSO_4$=5.5ppm, $MgCl_2$=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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COMPREHENSIVE EXAMINATION

I Semester 2016 - 2017 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)

1. Define calorific value of a fuel. Mention its types.
2. What are adhesives? Give examples.
3. What is the function of an indicator in titration? List the types of indicators.
4. Differentiate between primary and secondary batteries with one example each.
5. 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: $Mg(HCO_3)_2$: 25.5 mg/L ; $MgSO_4$: 14.7 mg/L ; $MgCl_2$: 19.8 mg/L ; $CaSO_4$: 30.5 mg/L; $Ca(HCO_3)_2$: 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)**

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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 / CHG 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.