

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc
BRANCH: CHEMISTRY

SEMESTER : IX
SESSION : MO/19

SUBJECT: SAC3003 INDUSTRIAL CHEMISTRY

TIME: 3:00 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) What are the three types of industrial boilers? What are their advantages and disadvantages? [6]
Q.1(b) What is a heat exchanger? With clear schematic, outline a *shell and tube* type heat exchanger with 2 tube passes and 1 shell pass. [6]
- Q.2(a) What are chemical fuels? Give complete classification of chemical fuels with examples. [6]
Q.2(b) Explain the proximate analysis of coal. How is it carried out? What is significance? [6]
- Q.3(a) Describe how the calorific value of solid fuel is determined using Bomb calorimeter. [6]
Q.3(b) What is meant by cracking of liquid fuel? Describe the catalytic cracking with neat diagram. [6]
- Q.4(a) What is Caustic embrittlement? How is it removed? [6]
Q.4(b) What is Priming and foaming? How is it removed? [6]
- Q.5(a) Discuss the mechanism of action of organo chloro pesticides. What are its advantages and disadvantages over organophosphate and carbamate-based pesticides? [6]
Q.5(b) What are systemic and selective herbicides? [6]
- Q.6(a) What are nylons? Discuss the nomenclature of nylons. [6]
Q.6(b) Outline the synthesis of nylon by 'ring opening' polymerization. [6]
- Q.7(a) Discuss the metallurgical process of iron with schematic diagram. [6]
Q.7(b) Discuss the monitoring and control devices used in any industrial plants for control of air pollution? [6]

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