

C 58172

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Name.....

Reg. No.....

**FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
JUNE 2009**

CH 04 403—PHYSICAL AND ANALYTICAL CHEMISTRY

(2004 Admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

- I. (a) Briefly discuss the classification of colloids.
(b) State and explain Henry's law.
(c) Explain the principle of coulometry.
(d) What are the basic differences between atomic emission and atomic adsorption spectroscopy?
(e) What is the basic principle of mass spectroscopy? What are its uses?
(f) Write a note on column packings used in exclusion chromatography.
(g) Explain the significance of sonochemical reactions.
(h) Compare photochemical reactions with thermal reactions.
- (8 × 5 = 40 marks)
- II. (a) What is a micelle? Explain the mechanism of micelle formation. What are the properties of micellar colloid solutions?
- Or*
- (b) What are colligative properties? Discuss the physical significance of ebullioscopic constant and cryoscopic constant.
- (15 marks)
- III. (a) Describe the principles of potentiometric titration and conductometric titration bringing out clearly the difference between the two.
- Or*
- (b) Discuss the basic principle of IR, UV and visible spectroscopy. What are the applications of these methods?
- (15 marks)
- IV. (a) Explain the principle of HPLC. How is it used in qualitative and quantitative analysis?
- Or*
- (b) Explain the principle of thermogravimetric analysis. What are its applications? How is it different from DTA?
- (15 marks)

Turn over

V. (a) What are the laws of photochemistry ?

Discuss the mechanism of :

- (i) Ozone formation in troposphere.
- (ii) Ozone depletion in stratosphere.

Or

(b) Write notes on :

- (i) Use of ultrasonic cleaning baths for SCRs.
- (ii) Probe system for sonochemistry.

(8 + 7 = 15 marks)

[4 × 15 = 60 marks]