# BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
## B.Tech.Sem - VI CHEMICAL : WINTER- 2022
## SUBJECT : PROCESS INSTRUMENTATION & INSTRUMENTAL METHODS OF ANALYSIS

Day : Tuesday
Date : 29-11-2022

**W-13511-2022**

Time : 10:00 AM-01:00 PM
Max. Marks : 60

**N.B.:**

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat labelled diagrams **WHEREVER** necessary.

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**Q.1** Distinguish between: **(10)**
i) Accuracy and precision ii) Repeatability and reproducibility
iii) Resolution and threshold iv) Backlash and drift
v) Range and span

**OR**

**Q.1** Describe the principle, construction and working of bimetallic thermometer used for temperature measurement. **(10)**

**Q.2** Describe the UV absorption spectroscopy techniques of composition analysis. **(10)**

**OR**

**Q.2** Discuss the Mass spectroscopy techniques of composition analysis. **(10)**

**Q.3** State the application of electrolytic conductivity measurement for composition analysis **(10)**

**OR**

**Q.3** Describe the use of thermal conductivity of gases for composition analysis. **(10)**

**Q.4** **a)** How chromatography is superior separation techniques over the other techniques like melting, boiling, evaporation, drying etc? **(07)**
**b)** Classify chromatography methods. **(03)**

**OR**

**Q.4** Describe Gas chromatography in detail. **(10)**

**Q.5** Justify the first order behaviour of a continuous stirred tank reactor. Derive the transfer function and hence step response characteristics of the system. **(10)**

**OR**

**Q.5** Describe classification of second order system based on values of damping ratio. Compare the step response characteristics of under damped, over damped and critically damped system. **(10)**

**Q.6** Describe feedback control strategy with suitable example. **(10)**

**OR**

**Q.6** Discuss the following control actions: **(10)**
i) PI ii) PD iii) PID

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