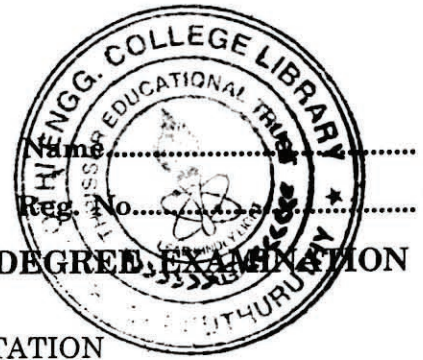


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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
MAY 2013**

**AI 04 704— ADVANCED INSTRUMENTATION
(2004 Admissions)**

Time : Three Hours

Maximum : 100 Marks

Part A

I. Answer *all* questions :—

- (a) Write short notes on smart transmitters.
- (b) Explain the working principle of a hair hygrometer.
- (c) List out the characteristic of an ideal phase meter.
- (d) What is the maximum frequency that can be measured with the reciprocating instrument if the counter has 8 bit output and clock frequency is 1 kHz ?
- (e) A 4-digit voltmeter has following ranges 99.99, 9.999 and 0.9999 V. Design a suitable auto ranging circuit based on flash method such that the input resistance is 10 M Ω .
- (f) Explain the measurement of modulation index with a neat block diagram.
- (g) Distinguish between GPIB bus expanders and bus extenders.
- (h) List out the drawbacks of using USB in industrial applications.

(8 × 5 = 40 marks)

Part B

Answer one question from each module.

Module I

- II. (a) (i) Discuss the working principle of a commercial dew point meter. (10 marks)
- (ii) Explain working principle of an impedance hygrometer. (5 marks)

Or

- (b) (i) Explain in detail about gas densitometers. (10 marks)
- (ii) Write short notes on displacer type densitometer. (5 marks)

Module II

- III. (a) (i) Explain automatic accumulation method of phase measurement with a neat block diagram. (8 marks)

Turn over

- (ii) Explain various sources of error that affect accuracy of phase measurement. (7 marks)

Or

- (b) (i) Explain in detail about capacitance measurement using a Schmitt trigger. (9 marks)
(ii) Explain the working principle of a peak frequency recorder. (6 marks)

Module III

- IV. (a) (i) Write short notes on minimizing electric field interference. (8 marks)
(ii) Explain in detail about grounding of analog circuits. (7 marks)

Or

- (b) (i) Explain the architecture of a virtual instrument with a neat block diagram. (10 marks)
(ii) Discuss Hall's circuit for measuring quality factor. (5 marks)

Module IV

- V. (a) (i) List out the characteristics of RS-422 serial interface. (6 marks)
(ii) Explain the structure of GPIB interface with a neat block diagram. (9 marks)

Or

- (b) (i) Explain in detail about virtual instrument software architecture. (8 marks)
(ii) List out the merits and drawbacks of RS 232 serial interface. (7 marks)

[4 × 15 = 60 marks]