C 42728 (Pages : 2)

Name.....

Reg. No.....

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 MΩ.

(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]