B.E. DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Third Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U13ECT302 **:** Measurements And Instrumentation

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1.   The error in the output readings of a measurement system that are consistently on one side of the correct reading is

   a)   Random error   b)   Systematic error

   c)   Calibration error   d)   Environmental error

2.   Wien bridge is mostly used to measure frequencies in …………….. range

3.   The Lissajous pattern observed on screen of CRO is a straight line inclined at 45° to x axis. If X-plate input is $2 \sin \omega t$, the Y-plate input is

   a) $2 \sin \omega t$ b) $2 \sin (\omega t + 45°)$

   c) $2 \sin (\omega t - 45°)$ d) $22 \sin \omega t + 45°$

4.   ……………..amplifier is used in electronic multimeters.

5.   A heterodyne wave analyzer operate on the principle of

   a)   mixing   b)   addition

   c)   subtraction   d)   amplification

6.   The frequency of function generator can be varied by changing the……………..

7.   Aperture error in ADC for DC signal is

   a)   1   b) ∞

   c)   0   d)   -1

8.   Digital voltmeter works on the principle of ……………..

9.   A transducer that converts measurand into the form of pulse is called

   a)   Analog transducer   b)   Digital transducer

   c)   Measurand transducer   d)   Pulse transducer

10. An instrument used to characterize an optical fiber is. ……………..

PART B (10 x 2 = 20 Marks)
(Not more than 40 words)

11. Classify the errors that may occur in an instrument.

12. Calculate the value of the unknown impedance (L_u, R_u) in the Maxwell bridge shown in figure if $R_1 = 159\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 5\Omega$ and $C = 1$ mF at balance condition.
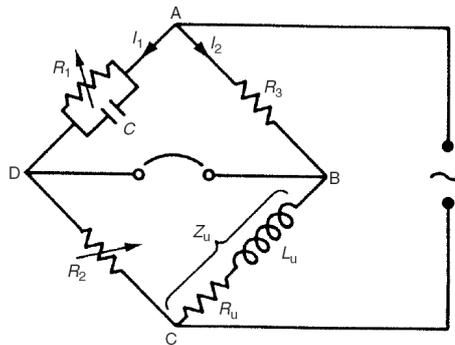
13. What is the principle of sampling oscilloscope?

14. Define Q factor of coil.

15. What is sweep frequency generator?

16. List out the four applications of spectrum analyzer.

17. Distinguish between analog and digital techniques.

18. Why period mode is preferred for measurement of very low frequency in a frequency counter?

19. What are the objectives of Data Acquisition system?

20. What is Multiplexing?

PART C (5 x 14 = 70 Marks)
(Not more than 400 words)

Q.No. 21 is Compulsory

21.   What do you meant by IEEE 488 bus system? Explain its characteristics, standards, advantages and disadvantages.

22. a) i) With neat diagram explain the construction, working principle, torque equation (10) and advantages, disadvantages of PMMC instrument.

       ii) Enumerate the static characteristics of an instrument. (4)

(OR)

b) i) How to measure the unknown capacitance using Schering's bridge? (10)

ii) Discuss international standards and working standards. (4)

23. a) Illustrate the working principle of cathode ray oscilloscope with its functional block diagram.

(OR)

b) i) Explain in detail about vector meter with its block diagram. (10)

ii) List out the applications of Q meter. (4)

24. a) Describe the working of function generator with the block diagram

(OR)

b) Describe the working of spectrum analyzer with a block diagram. Also list out the applications.

25. a) Explain with a neat block diagram, the operation of ramp type digital voltmeter.

(OR)

b) Describe the working principle of frequency counter with neat sketch

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