DEPARTMENT OF ELECTRNICS & COMMUNICATION ENGINEERING, KITSW

COURSE: **U14EI 205 - BASIC ELECTRONICS ENGINEERING**	ECE-I, Semester-II, 2015-16

ASSIGNMENT-7

Topic	Assignment Posted On	Submission Due On
FET & Measurement Systems	25.04.2016	**09.05.2016**

Note:

- *Write the answers legibly and neatly.*
- *Use a different color pen for writing questions and draw a horizontal line at the end of each answer*
- *Leave left margin on each page*
- *Write only on one side of the page. This will facilitate you to use the other side to add extra notes or to incorporate any corrections to your solutions after verifying them with the solutions posted on course web page.*
- *Your objective of writing assignments is not for the sake of submitting, only to get assignment marks. Writing assignments is a part of learning process, after listening to class lectures. After all, You will be referring to class notes and assignment notes for MSEs and ESE.*
- *Make an honest effort to solve the assignment problems. In case of difficulty, discuss with friends / Teacher and refer to solutions as a last resort. Finally, rework the solutions on your own for submission*
- *You will be graded based on the quality of your work. Please do not let your efforts go in vain*
- *Class notes and Assignment will keep you in comfortable position in MSEs and ESE*

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Read the questions carefully, and answer them in detail

1. Draw the block diagram of Public Addressing System and explain the function of each block.
2. Differentiate between FET and BJT.
3. Explain the structure and operation of FET.
4. Draw the block diagram of a measurement System and explain the function of each block. As an example draw the block diagram for a weight measurement system using load cell and strain gauges.
5. Define and explain various static characteristics of a measuring instrument.
6. The true value of the voltage across a resistor is 80V. However, when a 0-100V meter is employed, the measurement reading obtained is 79V. Calculate:
    (i)   absolute error
    (ii)   relative error as function of measured value
    (iii)   relative error as function of fsd
7. With a neat sketch, explain the principle of permanent magnet moving coil (PMMC) instrument and discuss briefly the errors in PMMC.
8. With the help of circuits explain how PMMC can be used as
    (i)   an ammeter
    (ii)   multirange ammeter using Aryton shunt with necessary equations

     (iii)   voltmeter

     (iv)   multirange voltmeter with necessary equations

9. With required circuits and necessary computations, explain how a PMMC movement of range 0-25mA, with an internal resistance of $20\,\Omega$, can be
     (i)   extended to a range of 0-100mA; and
     (ii)   converted into an Voltmeter of range 0-10V.

10. Two resistors R_1=140kΩ and R_2=100kΩ are connected in series across 12V supply. A voltmeter on a 10V range is connected to measure the voltage across the resistor 'R_2'. Calculate
     (i)   actual value of voltage across R_2 ,
     (ii)   measured voltage across R_2 with voltmeter having sensitivity of 20kΩ/V
     (iii)   measured voltage across R_2 with voltmeter having sensitivity 200kΩ/V
     (iv)   % error in both the above cases

What is your comment on the result with reference to sensitivity of the voltmeters used?

Instruction: Submit the solutions during the lunch break on or before due date @ <mark>Room No: B-I-208</mark>

<u>Faculty</u>: *K. Ashoka Reddy, Room #: BI-208*