BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BE **SEMESTER: III**
BRANCH: ECE **SESSION : MO/2018**

SUBJECT : EC3203-MODERN INSTRUMENTS & MEASUREMENT

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What is drift? What are the different types of drift? How it is related to reproducibility? [2]
(b) What are the basic blocks of a generalized Instrumentation system? Draw the various blocks and explain their functions [3]

Q2 (a) Define precision. How it is related to number of significant figure. Find the significant figure of 0.0025 and 2500. [2]
(b) What is the true value of current in the register R1 in the figure1? If an ammeter of 1 Kohm resistance is used to measure the current in the resistor R1, What will it read? [3]

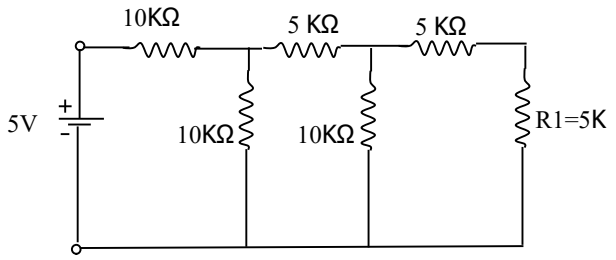

Figure 1

Q3 (a) How the instruments are classified based on their operation. [2]
(b) construction and working of PMMC instrument. Write down the advantages and limitations of PMMC instruments over Moving iron instrument [3]

Q4 (a) A PMMC meter is having internal resistance of 100 Ω and full scale current of 1mA. This is to be converted to a multi-range dc voltmeter with a range of 0-10V, 0-50V, 0-250V, 0-500V. find the values of various resistances using potential divider arrangement. [2]
(b) Describe the construction and working of series type ohmmeter. Write down their design equation. Why series type ohmmeter is preferred over shunt type ohmmeter. [3]

Q5 (a) With suitable diagram derive the expression for bridge balance condition in AC bridge [2]
(b) Explain how Kelvin's double bridge removes the effect of lead resistances while measuring low value resistances. [3]

Q6 (a) Derive the expression for frequency in wien's bridge. Write down different applications of Wien's bridge [2]
(b) With suitable circuit diagram and phasor diagram explain how Schering bridge is used for measurement of unknown capacitance. [3]

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