

Federal University of Technology Minna,
School of Science and Technology Education
Department of Industrial and Technology Education
First Semester Examination 2017/2018 Session

COURSE: - Electrical Measuring Instruments and Testing.

COURSE CODE: ITE 351

DURATION: 2 hours,

INSTRUCTION: Answer **all** questions in section A and any **two** questions in section B.

SECTION A (36 MARKS)

- 1a What are two methods of measurement in Electrical and Electronics and explain two types of direct method of measurement **(5 marks)**
 - b Write short note on the followings:
 - i. Indicating instruments **(2 marks)**
 - ii. Integrating instruments **(2 marks)**
 - iii. Recording instruments **(2 marks)**
 - c What is controlling device? Explain with the aid of diagrams the two types of controlling devices in indicating instrument. **(7 marks)**
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- 2a State three characteristics each of Ammeter, Voltmeter and Ohmmeter **(6 marks)**
 - b A meter resistance $0.003K\Omega$ has a full scale deflection of $10mA$. Determine the value of shunt resistance required in order that full scale deflection should be (a) $180mA$ (b) $120mA$. **(4 marks)**
 - c With the aid of diagrams explain the construction and principles of operation of attraction and repulsion type moving iron instrument. **(8 marks)**

SECTION B (24 MARKS)

- 3 State four checks/tests needed to be carried out in electrical installation. Explain three and their procedures. **(12 marks)**
- 4 Explain with the aid of well labeled diagram the construction and principle of operation of electrodynamic instrument **(12 marks)**
- 5a A moving coil instrument gives full scale deflection for a current of $120mA$ neglecting the resistance of the instrument. Calculate the approximate value of series resistance needed to enable the instrument to measure up to $220V$ **(4 marks)**
- b A moving coil instrument having a resistance of $0.035K\Omega$ gives a full scale deflection when the current is $45mA$. Calculate the value of the multiplier to be connected in series with the instrument so that it can be used a voltmeter for measuring potential difference up to $250V$ **(4 marks)**
- c State four advantages of digital instruments **(4 marks)**
- 6 Explain with the aid of diagram the construction and principle of operations of Hot-wire Instrument (Ammeter and Voltmeter) and state two advantages and two disadvantages. **(12 marks)**

/Wish you Success/stm/