$\boxed{\textbf{R20}}$

III B. TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER - 2022
ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(Electrical and Electronics Engineering)

Time: 3 Hours   **Max. Marks: 70**

Note: Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**
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UNIT-I

1. a) Identify the type of torque is responsible for operation of measuring instrument-Justify your answer with proper reason? [7M]

   b) How the extension of ammeter is possible? Analyze with proper circuit diagram. [7M]

(OR)

2. a) What does meant by current transformer – mention its importance by the help of applications. [7M]

   b) A meter reads 127.50V and the true value of voltage is 127.43. Obtain the [7M]
   i) the static error   ii) the static correction for this instrument.

UNIT-II

3. a) Dynamometer wattmeter used for measurement of power – Interpret your answer for 3-Phase power measurement of unbalanced load. [7M]

   b) A wattmeter has a current coil of 0.1 Ω resistances and pressure coil of 6500 Ω resistance. Calculate the percentage errors, due to resistance only with each of the methods of connection, when reading the input to an apparatus which takes: [7M]
   (i) 12 A at 250 V with unity power power factor, and
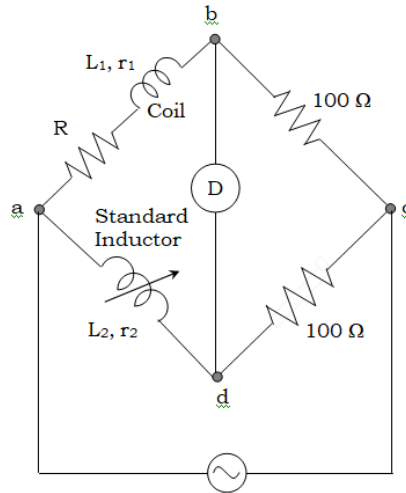   (ii) 12 A at 250 V and 0.4 power factor

(OR)

4. a) By the help of neat diagram, write about the power factor meter in detail? [7M]

   b) Weston type synchroscope is used for condition of synchronization – explore your justification regarding to this statement? [7M]

UNIT-III

5. a) Explain the term "standardization" of potentiometer. Describe the procedure of standardization of DC potentiometer with neat diagram. [7M]

   b) Write about Wheat stone's bridge operation for measurement of medium resistances with necessary balance expression? [7M]

(OR)

6. a) Illustrate the Maxwell's Inductance Bridge operation by representing the phasor diagram. [7M]

   b) A Maxwell's inductance comparison bridge is shown in Figure. Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with a non- inductive resistance R. Arm bc and ad are each a non- inductive resistance of 100 Ω. Arm ad consists of standard variable inductor L_2 of resistance 32.7 Ω. Balance is obtained when L_2= 47.8 mH and R=1.36 Ω. Find the resistance and inductance of coil in arm ab. [7M]

UNIT-IV

7. a) Describe the different electrical methods for measurement of liquid level using transducer. [7M]

   b) Write about the operation of Piezo electric and Photo Diode Transducers? [7M]

(OR)

8. a) How the Pressure can be determined using transducer – Justify your answer with neat diagram by any one method. [7M]

   b) With suitable method, outline the measurement of Angular velocity and its operation? [7M]

UNIT-V

9. a) In view of following parameters, summarize the digital meters advantages. i) Accuracy ii) Resolution iii) Power requirements iv) Cost and Portability [7M]

   b) Illustrate the basic block diagram of digital voltmeter and present its operation. [7M]

(OR)

10. a) Write about digital frequency working with necessary diagram. [7M]

    b) Explain the working of digital multimeter with block diagram. [7M]

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