



B.Tech VI Semester Regular/Supplementary Examinations, June 2022

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 70

Date: 18.06.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What kind of damping is used in PMMC type instrument?
- 2 What is the reason for using MI instruments on both AC and DC?
- 3 State the advantages of AC potentiometers.
- 4 What is the precaution to be followed while using current transformer?
- 5 What is the working principle of dynamometer type instrument?
- 6 What is a Trivector meter?
- 7 Which type of detector is used in AC bridges?
- 8 Write about loss of charge method?
- 9 State Piezoelectric effect.
- 10 Define the Gauge Factor of a Strain Gauge.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Describe the construction and working of PMMC instrument. [10M]
OR
- 12 a) Describe the moving iron instrument working with a neat sketch and derive the torque equation. [6M]
b) Discuss various measurement errors in the instrument. [4M]
- 13 a) Draw the circuit diagram of DC Crompton's potentiometer and explain its working. [5M]
b) A DC Crompton's potentiometer consists of a resistance dial having 15 steps of 10Ω each and a series connected slide wire of 10Ω which is divided into 100 divisions. If the working current of the potentiometer is 10 mA and each division of slide wire can be read accurately upto $1/5$ th of its span, calculate the resolution of the potentiometer in volts. [5M]
OR
- 14 Describe the operation of the current transformer and derive the ratio error and phase angle error. [10M]

15 Explain briefly about the types of three phase wattmeter configurations. [10M]

OR

16 a) Explain the working principle of single-phase induction type energy meter with neat diagram. [6M]

b) Write about errors in induction type energy meter. [4M]

17 a) Describe the circuit of Kelvin double bridge used for measurement of low resistance. Derive the conditions for balance. [5M]

b) Describe Carey Foster's slide wire bridge. [5M]

OR

18 a) Derive the bridge balance condition for the Maxwell bridge. [5M]

b) Describe the general form of an AC bridges and discuss its importance. [5M]

19 a) With the help of characteristics discuss the principle of operation of LVDT and its advantages. [5M]

b) Enumerate the differences between a PN diode and a Photo diode and briefly explain the working of Photo diode. [5M]

OR

20 Write down the construction and working principle of a thermocouple. Compare different thermocouple materials. [10M]