

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2023**

Semester : Semester V - 2020

Course Code : EEE2012

Course Name : Sem V - EEE2012 - Electrical and Electronics Measurements and Instrumentation

Program : B.Tech. Electrical and Electronics Engineering

Date : 6-JAN-2023

Time : 9.30AM - 12.30PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.

PART A

ANSWER ALL THE TEN QUESTIONS

10 X 2 = 20M

1. Nominal ratio in a C.T is given by
 - a) Actual primary current/Actual secondary current (CO1) [Knowledge]
 - b) Actual Secondary current current/Actual primary current
 - c) Rated Secondary current current/Rated primary current
 - d) Rated primary current/Rated secondary current
2. Which of the following is caused by careless handling?
 - a) Systematic error (CO1) [Knowledge]
 - b) Gross error
 - c) Random error
 - d) None of the mentioned
3. Hysteresis loss can be reduced by
 - a) Laminating the core (CO2) [Knowledge]
 - b) using silicon steel
 - c) both
 - d) none

4. DC and AC instruments are used for measurement of DC and AC quantities. Permanent magnet moving coil instruments are used for measurement of _____ (CO2) [Knowledge]
- a) high frequencies
 - b) low frequencies
 - c) only dc
 - d) both ac and dc
5. In CRO image on the screen is observed due to? (CO3) [Knowledge]
- a) Bronze excitation
 - b) Silicon excitation
 - c) phosphor excitation
 - d) sulphur excitation
6. DSO is a device which is a (CO3) [Knowledge]
- a) Analog image plotter without memory
 - b) Analog image plotter with memory
 - c) Digital image plotter with memory
 - d) Digital image plotter without memory
7. Actuators are devices that _____ (CO4) [Knowledge]
- a) Converts physical event into electrical Signal
 - b) Converts electrical signal into physical event
 - c) Both a and b
 - d) Converts electronic signal into electrical signal
8. A thermistor is a device which exhibits _____ (CO4) [Knowledge]
- a) Negative temperature coefficient
 - b) Positive temperature coefficient
 - c) See-back Effect
 - d) Coupling effect
9. A transducer is a device that converts energy from one form to another. Transducers may be classified according to their application, method of energy conversion, nature of the output signal, and so on. Self-generating type transducers are _____ Transducers (CO5) [Knowledge]
- a) Passive
 - b) Inverse
 - c) Active
 - d) Secondary
10. A Capacitive Transducer is a passive transducer which is used to measure the pressure, displacement, and other physical quantities. Capacitive transducer operate upon the principle of _____ (CO5) [Knowledge]
- a) variation of overlapping area of plates
 - b) variation of separation of plates
 - c) variation of relative permittivity of dielectric material between two plates
 - d) all of the above

PART B

ANSWER ALL THE FOUR QUESTIONS

4 X 10 = 40M

11. In a survey of 15 owners of a certain model of car, the following figures for average petrol consumption were reported.

25.5, 30.3, 31.1, 29.6, 32.4, 39.4, 28.9, 30.0, 33.3, 31.4, 29.5, 30.5, 31.7, 33.0, 29.2

a) Identify the unknown parameters that could be computed from the given data

b) Compute the unknown parameters

(CO1) [Comprehension]

12. A multirange DC mA with a basic meter having a resistance 75 Ohms and full scale deflection for the current of 2 mA. It is desired to operate at ranges of 0-10 mA, 0-50 mA, 0-100 mA.

a) Identify the unknown parameters that could be computed with the given data

b) Compute the unknown parameters

(CO2) [Comprehension]

13. Measurement of high voltages has always been an arduous task and hence some special types of equipments are used for that purpose. High voltages must be stepped down to a safer level before feeding the measuring meters and protective relays as these are low voltage devices and will get damaged. An equipment was installed in a substation for measurement of high voltages and for overvoltage protection. In that context discuss about the different parts of those types of equipments

(CO3) [Comprehension]

14. Some engineers got a contract of building an automatic monorail system, as their project in Bologna Italy, which would be powered mainly by the solar panels and additional power requirement will be met by some other sources of energy. The system is designed to operate using solar energy captured by photovoltaic panels placed at each monorail station and along the track's south facing side. It was suggested by some experts that a special type of a material which generates electrical power when compressed could be used as a source for meeting the additional power requirements by placing it on the track of the monorail system. Suggest and discuss about the material which could be used to fulfill the additional power requirements.

(CO4) [Comprehension]

PART C

ANSWER ALL THE TWO QUESTIONS

2 X 20 = 40M

15. Three resistances have the following ratings. $R_1=15\text{ Ohms}+ 5\%$

$R_2= 33+2\%$

$R_3= 75+5\%$

i) Identify the unknown parameters that could be computed from the given data ii) Compute the unknown parameters.

(CO1) [Application]

16. Explain with the help of supporting equations after Identifying and computing the value of the multiplier resistance on the 50 V range of the DC Voltmeter, that uses 250 micro-Ampere meter movement with an internal resistance of 100 Ohms.

(CO2) [Application]
