

**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN,
NUVEM-GOA
SEMESTER END EXAMINATION, JUNE 2022**

**Semester: IV Course name & Code: Electrical and Electronic Instrumentation
PYS 105**

Total marks: 60 Date: 18 /6/2022 Duration: 2 Hours Total No of pages: 2

Instructions:

- 1) All questions are compulsory, however internal choice is available.*
- 2) Figures to the right indicate maximum marks to the question.*
- 3) Symbols have their usual meanings unless otherwise stated.*
- 4) Draw neat circuit diagram wherever necessary.*
- 5) Use of non-programmable calculator is permitted.*

Q 1. Answer any four of the following: 2.5 x 4 = 10

- a. Explain with a diagram how a PMMC can be used as an ammeter.
- b. Explain with a diagram how a multirange ac voltmeter can be constructed using a PMMC.
- c. Explain with diagram the operation of a Wheatstone bridge.
- d. Define the droop voltage of an IC voltage regulator. What is the ideal value of droop voltage for LM 317 voltage regulator.
- e. Define PIV, rectification efficiency and ripple factor.
- f. State the need of a time base generator.

Q 2. Answer any four of the following: 2.5 x 4 = 10

- a. Explain the basic principle of a D'Arsonval movement.
- b. State why silicon diodes are preferred as rectifiers in ac voltmeter.
- c. Explain with a diagram how a bridge be used as an error detector.
- d. Determine the regulated output voltage for the circuit based on adjustable voltage regulator LM 317. Given V_{input} equal to 20 volts, $R_1 = 240\Omega$ and voltage set resistor $R_2 = 2.4K\Omega$.
- e. What is the purpose of sweep generator in a C.R.O.?
- f. Define deflection sensitivity of C.R.O. tube. What are the quantities measured by C.R.O.

Q 3.

A. Design a two range Aryton shunt ammeter to measure 10mA, 100mA using a meter movement of $R_m = 100 \Omega$ and $I_{fsd} = 1\text{mA}$. 5

OR

A. Explain the construction of a series type ohm-meter using de Arsonval meter. 5

B. Explain the operation of a full wave rectifier type ac voltmeter. 5

Q 4.

A. Draw the circuit diagram and obtain balance conditions for Maxwell's bridge. State the limitation of a Maxwell's bridge. 5

OR

A. Explain with a diagram the working principle of Kelvin's bridge. 5

B. What is the working principle of electrodynamicometer. Explain with neat sketch the single-phase electrodynamicometer type of meter. 5

Q 5.

A. Draw the circuit diagram transistor series voltage regulator and explain the principle of its operation. 5

OR

A. Draw the circuit diagram op-amp shunt voltage regulator and explain the principle of its operation

B. Explain the working of switching voltage regulator. 5

Q 6.

A. Explain with a diagram the operation of a continuous sweep generator. 5

OR

A. Explain with a diagram the operation of a triggered sweep generator. 5

B. Draw the basic block diagram of an oscilloscope and state the functions of each block. 5