

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIRST SEMESTER PRACTICAL EXAMINATION NOVEMBER 2024

MG1DSCPHY100 – Foundations of Physics

Duration: 2 hrs

Maximum Marks: 35

Record:5 marks

Attempt the question marked 'X'. Change of question is not allowed :30 marks

- 1 Measure the dimensions (diameter and length) of a metallic rod using a Screw Gauge and Vernier Calliper. Calculate the volume and surface area of the rod, considering random errors and error propagation. [A,S][6]
- 2 Compare the readings obtained using a screw gauge and a vernier calliper by measuring the diameter and thickness of a small cylindrical object (e.g., a thin metal rod or wire). Compare the readings obtained using a vernier calliper and a meter scale by measuring the length and width of a larger rectangular object (e.g., a metal or wooden block). [A,S][6]
- 3 Measure the thickness of the given wire using (1) a screw gauge and (2) a microscope. Record the readings taken in both cases with proper calibration. Compare the results obtained and the errors present in the two methods. [A,S][6]
- 4 Calculate the mass/density of the unknown liquid by measuring the loss of weight of a submerged object and applying the parallelogram law of vector addition. [A,S][6]
- 5 Set up a force table experiment to verify the vector addition of forces. Place the force table at specific angles and attach masses to each string to create forces of known magnitudes. [A,S][6]
- 6 Find the height of an object using Laser triangulation method [A,S][6]
- 7 Set up a simple pendulum with a length of approximately 1 meter. Using both an analogue stopwatch and a digital stopwatch, measure the time taken for 10 complete oscillations. Record your measurements accurately and calculate the time period T of the pendulum using each stopwatch. Determine the number of significant digits in each measurement and round your results appropriately. Analyze any differences in the time period calculations due to rounding. [An,S][6]
- 9 Identify the resistance values of two resistors using the color code. Verify each resistor's value using a multimeter. Then, compare the color-coded tolerance with the measured resistance value. [An,S][6]

- 10 Connect the two resistors in series and measure the total resistance using the multimeter. Repeat by connecting them in parallel. Record your observations and calculate the theoretical values for comparison. [An,S][6]
- 11 Write a Python program that functions as a basic calculator capable of performing the following operations: addition, subtraction, multiplication, and division. [An,S][6]
- 12 Write a Python program to find whether the number given as user input is odd or even / to find the largest number among the three numbers/ to find the sum of the first ten odd numbers [An,S][6]
- 13 Write a Python program to print the first twenty number of Fibonacci series/ the multiplication table of 10/ the string "How are you?" using loops. [An,S][6]

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MGU-UGP (HONOURS)

FIRST SEMESTER PRACTICAL EXAMINATION NOVEMBER 2024

MG1MDCPHY100 – Physics Around You

Duration: 2 hrs

Maximum Marks: 35

Record:5 marks

Attempt the question marked 'X'. Change of question is not allowed :30 marks

- 1 Demonstrate Ohm's Law using the following apparatus: a resistor, ammeter, voltmeter, variable power supply, and connecting wires. [An,S][5]
- 2 Find the radius of the wire, volume of the sphere and glass piece by measuring its dimensions using Screw gauge. [A,S][5]
- 3 Find the volume of the sphere and cylinder by measuring its dimensions using Vernier calliper. [A,S][5]
- 4 Demonstrate the use of a digital multimeter (DMM) to test diodes and measure electrical properties, including current, voltage, resistance, and capacitance. [An,S][5]
- 5 Using a Cathode Ray Oscilloscope (CRO), investigate and analyze the waveforms generated by a function generator set to produce sine, square, and triangular waves. [An,S][5]
- 6 Demonstrate standing waves using Melde's string experiment. Include the key steps in setting up the apparatus, adjusting the frequency, and observing the resulting wave patterns. [An,S][5]
- 7 Describe the procedure for demonstrating total internal reflection using a laser. Include details about the setup, the materials required, the angle of incidence you would use, and how you would visually observe the total internal reflection phenomenon. [An,S][5]
- 8 Describe the procedure you would follow to determine the height of an object using laser triangulation. Include details about the equipment needed, the setup configuration, and how you would calculate the height based on the angles and distances measured. [An,S][5]
- 9 Demonstrate the refraction of light through a prism. Describe the setup you would use, including the arrangement of the light source, prism, and screen. Explain how you would measure the angles of incidence and refraction, and how you would observe and illustrate the resulting spectrum of colors formed. [An,S][5]