

Reg. No.:



Name:

Y8346

University of Kerala

Second Semester FYUGP Degree Examination, June 2026

Discipline Specific Core Course

PHYSICS**UK2DSCPHY100 - Foundation Course in Physics-II**

Academic Level: 100-199

2024 Admission onwards

Time: 1 Hour 30 Minutes(90 Mins.)**Max. Marks: 42**

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	Define the principle of superposition of waves.	RE	2
2	Define surface tension.	RE	3
3	Describe frequency of a wave	UN	2
4	The tendency of a fluid to be raised or lowered in a capillary tube is called capillary action. Explain	UN	3
5	Name two types of mechanical waves and explain their basic characteristics.	UN	2
6	Outline the factors affecting fluid resistance.	UN	4

Part B. 8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the concept of nodes and antinodes in a standing wave.	UN	2
8	Explain a situation where terminal speed is a matter of concern.	UN	4
9	Demonstrate how viscosity influences laminar flow	AP	4
10	Apply wave relation to determine frequency if wave speed is 600 m/s and wavelength is 3 m.	AP	2

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) A medical syringe has a needle of radius 0.2 mm and a length of 3 cm. If a nurse applies a pressure difference of 1500 Pa and the viscosity of the fluid is 0.0015 Pa·s, apply Poiseuille's law to determine the flow rate of the fluid through the needle. OR B) Given a setup with a Venturimeter installed in a water pipeline, describe the procedure you would follow to determine the flow rate experimentally. Based on Bernoulli's principle and the equation of continuity, derive the working equation of the Venturimeter and explain how different parameters affect the measurement	AP	4, 4
12	A) Analyze the role of tension and mass per unit length in determining wave speed. OR B) Equation of a travelling wave is $y = 8 \times 10^{-2} \sin[2\pi(\frac{t}{.005} - 50x) + 2]$. Find amplitude, frequency, velocity, wavelength, wave number	AN	2, 2
13	A) A wave on a rope has a frequency of 50 Hz and a wavelength of 1.2 m. If the tension in the rope is doubled, the speed of the wave increases by a factor of 2. Estimate the new wave speed and wavelength. OR B) Compare and evaluate the differences between mechanical, electromagnetic, and matter waves in terms of their propagation, speed, and dependence on a medium.	EV	2, 2

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14	A) <table border="1"><thead><tr><th rowspan="2">Stress (MPa)</th><th colspan="5">Strain</th></tr><tr><th>Trial 1</th><th>Trial 2</th><th>Trial 3</th><th>Trial 4</th><th>Trial 5</th></tr></thead><tbody><tr><td>10</td><td>0.005</td><td>0.006</td><td>0.004</td><td>0.007</td><td>0.005</td></tr><tr><td>20</td><td>0.011</td><td>0.010</td><td>0.012</td><td>0.009</td><td>0.011</td></tr><tr><td>30</td><td>0.016</td><td>0.015</td><td>0.017</td><td>0.014</td><td>0.016</td></tr><tr><td>40</td><td>0.021</td><td>0.020</td><td>0.022</td><td>0.019</td><td>0.021</td></tr><tr><td>50</td><td>0.026</td><td>0.025</td><td>0.027</td><td>0.024</td><td>0.026</td></tr></tbody></table>	Stress (MPa)	Strain					Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	10	0.005	0.006	0.004	0.007	0.005	20	0.011	0.010	0.012	0.009	0.011	30	0.016	0.015	0.017	0.014	0.016	40	0.021	0.020	0.022	0.019	0.021	50	0.026	0.025	0.027	0.024	0.026		
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	A) Using the data given in table calculate mean strain data and standard deviation for each stress value.																																											
	B) Plot a graph with Stress along x-axis and Strain along y axis along with error bar																																											
	C) Analyse the graph and suggest the relationship between stress and strain as evident from graph.																																											
	OR																																											
	B) The following data shows the temperature recorded during an experiment:																																											
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(a) Plot a rough graph of temperature vs. time using the given data.(b) Include error bars for the uncertainties.(c) Discuss any visible trends and pattern observed.																																												