| PRN: | | Course Code: | U22PC101 |
|---|---|---|---|

F.Y. **B.Sc.** Semester End Examination Winter 2024

# Physics-I

000614

Day and Date: Mon 2 DEC 2024 Max Marks: **50**

Time: 10:30AM To 12:30PM Duration: **02** hrs

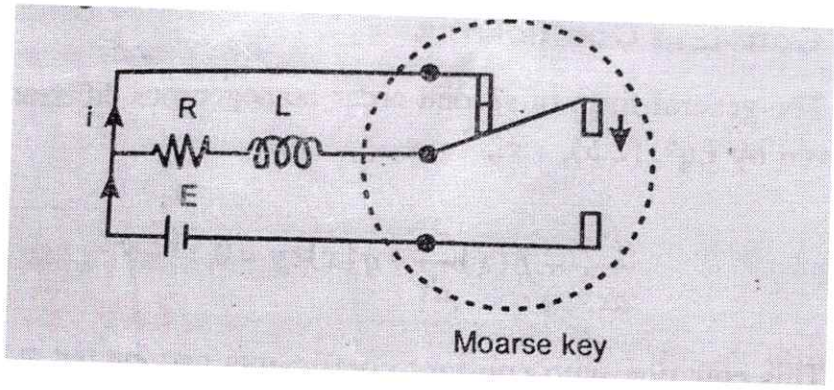
***Instructions:***

- All questions are ***compulsory***
- *Draw **neat labeled** diagram where necessary*
- Figures to the ***right*** shows ***full marks***
- ***Digital gadgets*** are ***not allowed***

| Q.1 | **Attempt the following** | Marks | Bloom's Level | CO |
|---|---|---|---|---|
| a) | Describe scalar and vector products. | **02** | L2 | CO1 |
| b) | State frame of reference. | **02** | L1 | CO2 |
| c) | Define angular displacement and angular velocity. | **02** | L3 | CO2 |
| d) | State end explain Hook's law of elasticity. | **02** | L1 | CO3 |
| e) | A water droplet of radius 0.002 m is resting on a surface. The surface tension of water is 0.072N/m. Calculate the force due to surface tension acting on the droplet. | **02** | L2 | CO4 |
| Q.2 | **Attempt any two from the following** | | | |
| a) | Find scalar product $(\vec{A}.\vec{B})$ for the following vectors<br>$\vec{A} = \hat{\imath}A_x + \hat{\jmath}A_y + \hat{k}A_z$<br>$\vec{B} = \hat{\imath}B_x + \hat{\jmath}B_y + \hat{k}B_z$ | **05** | L4 | CO1 |
| b) | Find the magnitude of resultant vector using triangular low of vector addition. | **05** | L3 | CO1 |
| c) | Obtain the equation for instantaneous current after the circuit is switched off. | **05** | L3 | CO1 |



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Q.3 **Attempt any two from the following**

| | | | | |
|---|---|---|---|---|
| a) | State and explain Newton's laws of motion. | **05** | L2 | CO2 |
| b) | What is frame of reference? Define its types. | **05** | L2 | CO2 |
| c) | Derive the equation for angular momentum for a system of particles. | **05** | L2 | CO2 |

Q.4 **Attempt any two from the following**

| | | | | |
|---|---|---|---|---|
| a) | What is artificial satellite? Give its applications. | **05** | L3 | CO2 |
| b) | Define moment of inertia (M.I). Find the equation for M.I. of a solid cylinder rotating about its own axis. | **05** | L1 | CO2 |
| c) | Discuss the Jaeger's method for determination of surface tension. | **05** | L2 | CO4 |

Q.5 **Attempt any two from the following**

| | | | | |
|---|---|---|---|---|
| a) | Derive the differential equation for Simple harmonic motion. | **05** | L4 | CO3 |
| b) | What is Poisson ration ($\sigma$). Find relation between Y, k, $\eta$ and $\sigma$. | **05** | L4 | CO3 |
| c) | Write and discuss the applications of Bernoulli's theorem | **05** | L4 | CO4 |

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