|  |  |  |
| --- | --- | --- |
| Question | What term | |
| Type | multiple\_choice | |
| Option |  | incorrect |
| Option |  | incorrect |
| Option |  | correct |
| Option |  | incorrect |
| Solution | An inertial frame is one where Newton’s laws hold true, including a stationary frame or one moving with constant velocity. | |
| Marks | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| Question | A body moves with speed 0.6c and has a relativistic mass of 2.5 kg. What is its rest mass? | |
| Type | multiple\_choice | |
| Option | 1.60 kg | correct |
| Option | 1.00 kg | incorrect |
| Option | 2.00 kg | incorrect |
| Option | 1.58 kg | incorrect |
| Solution | m=γm0, where γ=11-v2/c2. For v=0.6c, γ=1.25. Hence m0=m/γ=2.5/1.25=2.0 kg. | |
| Marks | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| Question | The momentum of a photon is: | |
| Type | multiple\_choice | |
| Option | p=mv | incorrect |
| Option | Zero | incorrect |
| Option | p=E/ | correct |
| Option |  | incorrect |
| Solution | For a photon, rest mass is zero. Its momentum is related to energy as p=E/c=hν/c. | |
| Marks | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| Question | According to Lorentz–Fitzgerald contraction: | |
| Type | multiple\_choice | |
| Option | moving ro | incorrect |
| Option | h | incorrect |
| Option | s longer length | correct |
| Option | longest length is for | incorrect |
| Solution | Length contraction predicts that an object moving at velocity v appears shorter along its direction of motion: L=L01-v2/c2. | |
| Marks | 1 | 0 |

|  |  |  |
| --- | --- | --- |
| Question | Which phenomenon related to moving clocks is predicted by the special theory of relativity? | |
| Type | multiple\_choice | |
| Option | Length | incorrect |
| Option | ontr | incorrect |
| Option | ction | correct |
| Option | Gr | incorrect |
| Solution | Moving clocks appear to tick slower compared to stationary clocks due to relativistic time dilation: Δt=γΔt0. | |
| Marks | 1 | 0 |