|  |  |  |  |
| --- | --- | --- | --- |
| 姓名：{{name}} | 学号：{{num}} | 班级：{{classno}} | 成绩：{{score}} |
| **实验名称：**刚体的转动惯量测定 | | | |

一、实验仪器：

1、(2分)该实验所用转动惯量仪的主要组成是：{{choice\_1}}

A、实验载物台、智能计时计数器、遮光细棒和光杠杆**×**

B、实验载物台、绕线塔轮、遮光细棒和小滑轮**√**

C、分光计、绕线塔轮、光具座和小滑轮**×**

二、实验目的：

1、(2分)该实验测定转动惯量的实验方法为：{{choice\_2}}

A、拉伸法 **×** B、三线摆法 **×** C、恒力矩转动法 **√**

2、(2分)转动惯量实验可以用来验证：{{choice\_3}}

A、平行轴定理 **√** B、马吕斯定理 **×** C、高斯定理 **×**

三、原理简述：

1、(3分)根据刚体的转动定律推导的转动惯量表达式正确的是：{{choice\_4}}

A、**×** B、**√**

C、**×**D、**×**

2、(3分)该实验中可以直接测量的物理量是：{{choice\_5}}

A、时间和角加速度 **×**

B、时间和角位移 **√**

C、角位移和角加速度**×**

3、(3分)角位移和计时次数的关系是 {{choice\_6}}

A、**√**B **×**C、**×**

4、(3分)实验时，当实验载物台转动时，智能计时器应置于状态：{{choice\_7}}

A、单电门 计时**×** B、多脉冲 计时 **×** C、多脉冲 测量中**√**

**5、**(3分)实验时，当砝码接触地面后，实验载物台仍在转动，此时处于状态：{{choice\_8}}

A、匀速 **×** B、匀减速 **√** C、匀加速**×**

6、(3分)验证平行轴定理实验中测得的转动惯量与的关系应呈 {{choice\_9}}

A、抛物线；**×**B、锯齿形 **×**C、线性 **√**

7、(3分)在验证平行轴定理实验时，下列操作不会影响验证结果？{{choice\_10}}

A、圆柱放置不对称 B、实验台上放有圆环

C、只放一个圆柱

8、(3分)在实验操作中不会导致实验误差的是{{choice\_11}}

A、绕线重叠**×** B、线与小孔接触**×** C、砝码落地后继续计时**×**

D、在进行匀减速测量时载物台慢慢转动**√**

四、实验内容及数据处理

1、(35分)测量圆环的转动惯量：

砝码质量{{blank\_1}} g 塔轮半径 {{blank\_2}} mm 

1. 实验载物台的转动惯量：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | =  {{table\_1\_9}} | K | 2 | 3 | 4 | 5 | =  {{table\_1\_18}} |
| t | {{table\_1\_1}} | {{table\_1\_2}} | {{table\_1\_3}} | {{table\_1\_4}} | t | {{table\_1\_10}} | {{table\_1\_11}} | {{table\_1\_12}} | {{table\_1\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_1\_5}} | {{table\_1\_6}} | {{table\_1\_7}} | {{table\_1\_8}} | t | {{table\_1\_14}} | {{table\_1\_15}} | {{table\_1\_16}} | {{table\_1\_17}} |
| 转动惯量: | | | ={{table\_1\_19}} | | | | | | | | |

1. 实验台加圆环的转动惯量：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | =  {{table\_2\_9}} | K | 2 | 3 | 4 | 5 | ={{table\_2\_18}} |
| t | {{table\_2\_1}} | {{table\_2\_2}} | {{table\_2\_3}} | {{table\_2\_4}} | t | {{table\_2\_10}} | {{table\_2\_11}} | {{table\_2\_12}} | {{table\_2\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_2\_5}} | {{table\_2\_6}} | {{table\_2\_7}} | {{table\_2\_8}} | t | {{table\_2\_14}} | {{table\_2\_15}} | {{table\_2\_16}} | {{table\_2\_17}} |
| 转动惯量: | | | ={{table\_2\_19}} | | | | | | | | |

实验测量值： **{{blank\_3}}**

理论计算值: 圆环外半径{{blank\_4}} mm 内半径{{blank\_5}} mm

圆环质量{{blank\_6}} g

＝{{blank\_7}}

相对误差（%） ＝{{blank\_8}}

2、（35分）验证平行轴定理：

**将两圆柱体对称插入实验台上与中心距离为的圆孔中，**

**测量实验台加圆柱体的转动惯量**

1. **45mm**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | ={{table\_3\_9}} | K | 2 | 3 | 4 | 5 | ={{table\_3\_18}} |
| t | {{table\_3\_1}} | {{table\_3\_2}} | {{table\_3\_3}} | {{table\_3\_4}} | t | {{table\_3\_10}} | {{table\_3\_11}} | {{table\_3\_12}} | {{table\_3\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_3\_5}} | {{table\_3\_6}} | {{table\_3\_7}} | {{table\_3\_8}} | t | {{table\_3\_14}} | {{table\_3\_15}} | {{table\_3\_16}} | {{table\_3\_17}} |
| 转动惯量: | | | ={{table\_3\_19}} | | | | | | | | |

1. **60mm**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | ={{table\_4\_9}} | K | 2 | 3 | 4 | 5 | ={{table\_4\_18}} |
| t | {{table\_4\_1}} | {{table\_4\_2}} | {{table\_4\_3}} | {{table\_4\_4}} | t | {{table\_4\_10}} | {{table\_4\_11}} | {{table\_4\_12}} | {{table\_4\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_4\_5}} | {{table\_4\_6}} | {{table\_4\_7}} | {{table\_4\_8}} | t | {{table\_4\_14}} | {{table\_4\_15}} | {{table\_4\_16}} | {{table\_4\_17}} |
| 转动惯量: | | | ={{table\_4\_19}} | | | | | | | | |

1. **75mm**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | ={{table\_5\_9}} | K | 2 | 3 | 4 | 5 | ={{table\_5\_18}} |
| t | {{table\_5\_1}} | {{table\_5\_2}} | {{table\_5\_3}} | {{table\_5\_4}} | t | {{table\_5\_10}} | {{table\_5\_11}} | {{table\_5\_12}} | {{table\_5\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_5\_5}} | {{table\_5\_6}} | {{table\_5\_7}} | {{table\_5\_8}} | t | {{table\_5\_14}} | {{table\_5\_15}} | {{table\_5\_16}} | {{table\_5\_17}} |
| 转动惯量: | | | ={{table\_5\_19}} | | | | | | | | |

1. **90mm**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 匀 减 速 | | | | | 角加速度 | 匀 加 速 | | | | | 角加速度 |
| K | 2 | 3 | 4 | 5 | ={{table\_6\_9}} | K | 2 | 3 | 4 | 5 | ={{table\_6\_18}} |
| t | {{table\_6\_1}} | {{table\_6\_2}} | {{table\_6\_3}} | {{table\_6\_4}} | t | {{table\_6\_10}} | {{table\_6\_11}} | {{table\_6\_12}} | {{table\_6\_13}} |
| K | 6 | 7 | 8 | 9 | K | 6 | 7 | 8 | 9 |
| t | {{table\_6\_5}} | {{table\_6\_6}} | {{table\_6\_7}} | {{table\_6\_8}} | t | {{table\_6\_14}} | {{table\_6\_15}} | {{table\_6\_16}} | {{table\_6\_17}} |
| 转动惯量: | | | ={{table\_6\_19}} | | | | | | | | |

生成- 关系曲线

{{@pic1}}