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***THE HASHMITE UNIVERSITY***

***ELECTRICAL ENGINEERING DEPARTMENT***

***ELECTRICAL MACHINES LAP***

*Lab Sheet*

**DC-Shunt Motor.**

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| **Group number: Students ID:** |
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**DC-Shunt Motor**

**A) Measuring some Characteristics of DC Shunt Motor.**

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| If(A)constant | Ia(A) | Vt(v) constant | P in (W ) | n(rpm) | (Nm) | Pout(W ) | η% |
| 0.28 |  | 220 |  |  | 0 |  |  |
| 0.28 | 1.5 | 220 |  |  |  |  |  |
| 0.28 | 3.0 | 220 |  |  |  |  |  |
| 0.28 | 4.5 | 220 |  |  |  |  |  |
| 0.28 | 6.0 | 220 |  |  |  |  |  |
| 0.28 | 6.7 | 220 |  |  |  |  |  |

Table 4-1

1. Plot speed versus torque curve. Explain the nature of the curve?

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1. Plot speed versus armature current curve. Explain the nature of the curve?

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1. Plot efficiency versus output power curve. Explain the nature of the curve?

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**B) Speed control of a DC Shunt Motor.**

 Table 4-2

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| If(A) | Ia(A) | Vt(v)  | P in (W ) | n(rpm) | (Nm) | Pout(W ) | η% |
| 0.28 | 3.0 | 220 |  |  |  |  |  |
|  |  | 200 |  |  |  |  |  |
|  |  | 150 |  |  |  |  |  |
|  |  | 100 |  |  |  |  |  |
|  |  | **50** |  |  |  |  |  |

1. Plot speed versus voltage curve. Explain the nature of the curve?

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1. Plot efficiency versus speed curve. Explain the nature of the curve?

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1. Why the armature current is increasing when the terminal voltage is decreasing?

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**2 - By Altering the Field Resistance.**

Table 4-4

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| If(A) | Ia(A) | Vt(v) constant | Pin(W) | n(rpm) | (Nm) **≈**constant | Pout(W ) | η% |
| 0.28 |  | 220 |  |  | 2 |  |  |
| 0.25 |  | 220 |  |  | 2 |  |  |
| 0.22 |  | 220 |  |  | 2 |  |  |

**Questions:**

1. Plot the curve of speed versus field current, and explain the nature of the curve.

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1. Plot the curve of armature current versus field current, and explain the nature of the curve.

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1. Plot the efficiency versus output power curve.

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1. What happens to speed when the excitation rheostat is increased?

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1. Can the speed of shunt motor be reduced by varying field resistance? Why?

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**C) Reversing the Direction of Rotation of DC shunt Motor.**

**Questions:**

1. If the direction of the current through the field is changed, what happens?

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1. If the direction of the current through the armature is changed, what happens?

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1. If the direction of the current through both the armature and field is changed, what happens? Explain why?

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**Conclusions:**

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