MCT 311L- Design of Machine Elements and CAD/CAM



Submitted to: Mam Amina Hassan

Submitted by: Haseeb\_ul\_hassan

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**Title**: Design a gearbox to drive bicycle using BLDC

Idea/Application:

I would like to present you a really critical problem,

Most of the transport is shifting towards hybrid as well as towards electric and in this on-going transformation key part is the MOTOR that gives basic power now, I like to use the normal BLDC motor to drive a bicycle but its RPM is approximately 10,000-2,00,000 and hence the km/h will be higher enough so I would love to design a speed reducer gear box to be used in between the motor and wheel of bicycle and so on we can increase torque

Design Requirements:

Most critical parameters are as bellow that are to be focused mainly;

1. Speed
2. Torque
3. Power
4. Drive time
5. Life cycle
6. Temperature/Environment
7. Material
8. Lubrication
9. Weight of the Bicycle rider and bicycle

Numerical Data:

1. D1(input) = 3.175mm
2. D2(Output) = 27mm
3. speed(out) = 0-50Km/h
4. Design life = 87600h
5. speed(in) = 0-11160rpm(3099.038901450977km/h)
6. Material(suggested) = Cast iron
7. Power input(Electrical) = 0-120w

Initial Sketch:

