



XMUT204 Electronic Design Design Project 1: 5 V Regulated Power Supply (Marking Schedule)

Due Date: See handout provided.

Marking Scheme

The submissions of the project typically consist of a project report (i.e. length of the report is expected to be approximately 2000 words excluding the appendices) and a video of presentation/ prototype demo of the project (i.e. approximately 10 minutes duration).

The project should be marked according to the suggested marking scheme as outlined below.

A. Design

This section should cover the design processes, choices and rationales. [10 marks]

- Determination of the parameters of the transformer (e.g. turn ratios of primary and secondary windings, inductance values and power rating). (2.5)
- Determination of the parameters of the full-bridge diode rectifier (e.g. max. voltage, max. current, PIV and power ratings). (2.5)
- Determination of the parameters of the voltage regulator (e.g. input and output voltage ranges, current rating and power rating). (2.5)
- Determination of the parameters of the capacitors (e.g. capacitance values, ripple voltage and voltage rating). (2.5)

B. Simulation

This section should consist of the simulation processes and simulation results. [10 marks]

- Simulations of the circuit for design (as in Part A). (5)
- Simulations of the circuit for testing (as in Part C). (5)

C. Testing

This section should have testing processes, testing results and troubleshooting. [10 marks]

- Load regulation test. (3)
- Line regulation test. (3)

- Efficiency test. (4)

D. PCB Layout

This section should have PCB design, construction process and PCB layout. [10 marks]

- Schematic diagram (for PCB layout). (3)
- PCB layout diagram. (3)
- Components placements according to the best practice for designing PCB. (2)
- PCB tracks routing following the best practice for designing PCB. (2)

E. Discussion

This should discuss the suggested project management aspects of the project. [10 marks]

- Problems in the project. (3)
- Critical evaluation of project. (3)
- Enjoyable and difficult parts of the project. (4)

F. Additional Questions

This part should have answers to additional questions. [10 marks]

- Q1 - Design for power supply with 5 V DC input. (2.5)
- Q2 - Role of capacitors in the solution circuit. (2.5)
- Q3(a) - Discussion of diode bridge in vibration harvester. (2.5)
- Q3(b) - Better power supply solution for vibration harvester. (2.5)

G. Project Report

The marking should focus on the quality and quantity of your project report. [20 marks]

- Content and coverage. (5)
- Organisation, layout and sectioning. (5)
- Use of figure, graph, table and reference. (5)
- Writing and language usage. (5)

H. Presentation and Demo

The marking should cover the quality and quantity of your project presentation & demo of your working prototype. [20 marks]

- Content and coverage. (5)

- Organisation and structure. (5)
- Use of audio and/or visual media. (5)
- Delivery and presentation skills. (5)

Marking Schedule

Section	Description	Total	Marks	Comments
Design	Design processes, choices, and rationales.	10		
Simulation	Simulation processes and simulation results.	10		
Testing	Testing processes, testing results, and troubleshooting.	10		
PCB Layout	PCB design, construction process, and PCB layout.	10		
Discussion	Discuss aspects of the project (e.g. problems in the project, evaluation of project, and enjoyable/ difficult parts).	10		
Additional Questions	Answers to additional questions: <ul style="list-style-type: none"> • Design for power supply with 5 V input. (2.5) • Role of capacitors in the solution circuit. (2.5) • Discussion of diode bridge in vibration harvester. (2.5) • Better power supply solution for vibration harvester. (2.5) 	10		
Project Report	Quality and quantity of your project report: <ul style="list-style-type: none"> • Content and coverage. (5) • Organisation, layout and sectioning. (5) • Use of figure, graph, table and reference. (5) • Writing and language usage. (5) 	20		
Presentation and Demo	Quality and quantity of your project presentation and successful demo of your prototype:	20		

	<ul style="list-style-type: none"> • Content and coverage. (5) • Organisation and structure. (5) • Use of audio and/or visual media. (5) • Delivery and presentation skills. (5) 			
Total		100		