272-Q21

BCTHS MECHATRONICS TECHNOLOGY

NAME: _____ ***START DATE:*** _____/_____/_____
COMPLETION DATE: _____/_____/_____

TASK: ***Switched mode power supply theory***

PERFORMANCE OBJECTIVE: ***Given a written test, the student will identify the areas and components of a switched mode power supply with at least 75% accuracy.***

ENABLING OBJECTIVE: ***Complete Q01 – Q20***

TOOLS REQUIRED: ***SMPS and Power supply theory video and instructor lecture***

SAFETY FACTORS: ***Complete Q01-Q02 and observe all school/classroom safety rules at all times***

ACADEMIC ANCHORS:
M11.A.1.1.2 Express numbers using scientific notation
M11.A.2.1.1 Solve problems operations with rational numbers using rates and percentages
M11.A.2.1.2 Solve problems using direct and inverse proportions
R11.A.1.3.5 Demonstrate after reading understanding of non-fiction text
R11.A.2.1.2 Identify meaning of content specific words used in text

CAREER & WORK ANCHORS:
13.2.11.E Demonstrate essential workplace skills.

PERFORMANCE CHECKLIST:

STUDENT CHECK	***TASK TO BE COMPLETED***	***TEACHER SIGN OFF***
	1. Identify academic anchors and complete learning guide AA01	_____
	2. Read info and Safety sheets	_____
	3. Complete Performance Sheets	_____
	4. Take written exam	_____

PERFORMANCE LEVEL:
MASTERY ***SATISFACTORY*** ***FAMILIARIZATION*** ***INSTRUCTED/CANNOT PERFORM***

BUCKS COUNTY TECHNICAL SCHOOL – June 17, 2021

_____
INSTRUCTOR'S SIGNATURE

272-Q21

Safety and information sheet

Follow all electrical safety rules when building, servicing, or making measurements in any power supply. Power supplies contain lethal voltages. Always work with someone near by. Always make sure capacitors are discharged when the unit is unplugged as it may still have lethal voltage.

Power supplies are used in almost every electronic device that is not battery powered. Their purpose is to take standard line voltage (120 V.A.C.) and convert it to the needed voltage for a device. They may also convert the voltage to D.C. and provide regulation.

272-Q20

PERFORMANCE SHEET

1. Why are Switched Mode Power Supplies (SMPS) sometimes called DC to DC converters?

2. How does a SMPS regulate voltage?

3. What is an OPTO coupler, OPTO Isolator, or photo coupler?

4. Why must a SMPS have a line choke?

5. What kind of protective devices does a SMPS utilize and why?

6. What circuit or components start the switch mode cycle?

7. Why does the switching cycle vary frequency and duty cycle?

8. Why do most SMPS's use half wave rectifiers on the secondary?

List 2 advantages and disadvantages of the SMPS over the standard transformer rectifier power supply.

9.

10.

11.

12.

13. How does troubleshooting the SMPS differ from troubleshooting the standard power supply?

GRADING RUBRIC

	Instructed/Cannot 0 points	Familiarization 1 point	Satisfactory 2 points	Mastery 3 points
Safety	Student rarely follows industry standard safety rules	Student needs to be frequently reminded to follow industry standard safety rules	Follows all industry standard safety rules, but required one reminder.	Student always follows all industry standard safety rules
Task	Student is unable to complete task	Student requires frequent assistance to complete task, and/or is familiar with some parts of the task	Student requires very little assistance to complete task, or has only completed task once or twice, but completed it satisfactorily with little to no assistance	Student can perform task with no assistance and has completed the task many times with no errors.

Mastery = 6 points
Satisfactory = 4-5 points
Familiarization = 2-3 points
Instructed cannot perform = <2 points