GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**CIRCUIT DESIGN USING NI ELVIS WORKSTATION**
Course Code	**EC/2020/026**
Course Duration	40 Hours
Minimum Eligibility Criteria	10th/+2 /ITI/Diploma/Graduate
Pre-requisites (if any)	-
Course Objectives	Training module has been designed for the participants to • Understand the features of NI ELVIS Workstation. • Learn the concept of virtual Instruments • Designing a application circuit suing ELVIS Platform
Course Outcomes	At the end of training, the trainees will be able to • Explain the use of ELVIS Board • Design application circuit using ELVIS
Expected Job Roles	Electronics Circuit Designer

TEACHING AND SCHEME OF EXAMINATION

Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EC/2020/026	CIRCUIT DESIGN USING NI ELVIS WORKSTATION	Theory	16	10	20	3 Hours
		Practical	24	40	80	
		Total	40	50	100	

EC/2020/026 – CIRCUIT DESIGN USING NI ELVIS WORKSTATION

DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	**Introduction to NI ELVIS Workstation**	**10 Hours**	
1.1	Features of NI ELVIS Workstation – Protoboard	08	02
1.2	Basic Circuit Components		
1.3	Hardware Features of ELVIS Workstation		
1.4	Operating Software		
II	**Design of Application circuit I using ELVIS**	**15 Hours**	
2.1	Measuring Components Values	05	10
2.2	Building a Voltage Divider Circuit- Using the Power Supply		
2.3	Using the DMM to Measure Current		
2.4	Using the Function Generator and Oscilloscope		
2.5	Photodetector Application		
2.6	Controlling one LED with one comparator using DC Power supply		
2.7	Converting varying signal (AC) to Constant Signal (DC)		
2.8	Analog signal Level Meter using LED		
2.9	Build a thermometer using DMM SFP		
III	**Design of Application circuit II using ELVIS**	**15 Hours**	
3.1	Sinusoidal signals and Frequency	03	12
3.2	Music Equalizer using Op-Amp – Filter Circuit		
3.3	Music Composer using IC 555 Timer		
3.4	Clipper and Clamper Circuit		
3.5	Concept of Virtual Instruments		
3.6	Mini Project 1& 2		
	Total Theory / Practical Hours	**16**	**24**
	Total hours	**40**	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	NI ELVIS Board
2	PC/Laptop

SOFTWARE REQUIREMENT

S.NO	NAME OF THE SOFTWARE
1	LABVIEW
2	ELVIS Instrument Launcher

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Introduction to Engineering : A starter guide with Hands-on Analog Multimedia Explorations	Lina J, Karam and NajiMounsef	Morgan & Claypool Publishers
2	NI ELVIS Manual	-	National Instruments

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Circuit Diagram	20
	b)Procedure and Connections / Execution	20
	c)Result and Viva	20
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

EC/2020/026 – CIRCUIT DESIGN USING NI ELVIS WORKSTSTION

(Maximum Marks: 20)

(N.B: Answer any Twenty questions) 20x1= 20 Marks

1. Write any two features of NI ELVIS workstation - protoboard.
2. Expand AI and PFI.
3. How many user configurable LEDs are presented in NI ELVIS workstation - protoboard.
4. Expand DMM.
5. Write any two basic circuit components.
6. Write any two hardware features of NI ELVIS workstation.
7. Which software supports NI ELVIS II Series hardware?
8. What is the use of variable power supplies manual controls?
9. Expand SFP.
10. What is mean by digital reader?
11. Expand ARB.
12. Write any two usages of DMM?
13. What is the output voltage V across R2, in a voltage divider circuit?
14. What is the use of NI ELVISmx Oscilloscope?
15. What is the use of photo detector?
16. Which device is a current controlled current amplifier?
17. How many diodes are presented in a bridge rectifier?
18. Write the mathematical representation of a sinusoidal signal.
19. What is the unit of frequency?
20. What are the signals generated by the NI ELVISmx Function generator?
21. What is music equalization?
22. Expand BPM.
23. What is another name of clipper?
24. Write any two types of clipper.
25. What is another name of clamper?