Register Number:……..

KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Seventh Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECE0053:Virtual Instrumentation

COURSE OUTCOMES

CO1: Construct basic instruments using LABVIEW.
CO2: Select data acquisition cards for analog and digital data.
CO3: Analyze the given images using different image processing tools.
CO4: Build a machine vision system.
CO5: Design real time control systems using LABVIEW.
CO6: Describe the PC hardware and operating system for virtual instrumentation.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	"For loops can replace While loops" – Show if the statement is true? Comment on it.	CO1	[K_2]
2.	Compare Traditional Instrumentation and Virtual Instrumentation.	CO1	[K_2]
3.	Justify why a device is called as "Plug and Play".	CO2	[K_2]
4.	Justify the need for timers and counters for in hardware synchronization?	CO2	[K_2]
5.	List five different consumer products which use image processing.	CO3	[K_2]
6.	Outline the importance of building machine vision system for virtual machines.	CO4	[K_2]
7.	Summarize the stages of any image processing tool as an example of VI.	CO4	[K_2]
8.	Justify the need for Designs using VI Software when the cost of the software is high.	CO5	[K_2]
9.	Recall NI – ELVIS software.	CO6	[K_2]
10.	List the different types of analog and digital interfaces.	CO6	[K_1]

Answer any FIVE Questions:
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Explain about modular programming and how it helps virtual instrumentation	8	CO1	[K_2]
	b)	Develop an algorithm to create a simple calculator with only addition, subtraction, division, and multiplication options.	8	CO1	[K_3]

12.	a)	Build a short explanation on how a system recognizes input voltage variations, with reference voltage. Give limitations to this method.	8	CO2	[K_3]
	b)	Identify differences between arrays, matrices, and clusters.	8	CO2	[K_3]
13.	a)	Identify 5 issues in selection of Data acquisition cards for VI image processing.	8	CO3	[K_3]
	b)	Compare different image file types and explain where each can be used?	8	CO3	[K_2]
14.	a)	Using IMAQ Vision, develop algorithms for a rice sorting commercial system and coin sorter system.	16	CO4	[K_3]
15.	a)	Explain the usage of ON/OFF controllers and Proportional controllers.	8	CO5	[K_3]
	b)	Compile any one case study on development of HMI in VI.	8	CO5	[K_4]
16.	a)	Explain PC architecture and operating system required for good design software	8	CO6	[K_2]
	b)	Outline the importance of transducers and summarize their power, speed, and timing considerations.	8	CO6	[K_2]

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