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	<b>PESIT Bangalore South Campus</b> Hosur Road (1km before Electronic City), Bengaluru -560 100 <b>Department of Basic Science and Humanities</b>									

<b>CIE TEST -3</b>			
Date		: 15-05-2018	Marks:60
Subject & Code		: <b>Basic Electronics – 17ELN25</b>	Section: F,G,H,I,J
Name of faculty		: Prof. SB, UB, KB	Time : 8:30AM to 10.00AM
<b>Note: Answer FIVE full questions choosing any ONE full question from each part.</b>			<b>Marks</b>
<b>PART 1</b>			
1	a	<b>What is the difference between latch and flip flop</b> <i>Ans) 4 differences</i> <div style="text-align: right;"><i>[1+1+1+1]</i></div>	4
	b	<b>Explain the working of R-S flip-flop using NAND gates with relevant circuit diagram and truth table</b> <i>Ans) Explanation + NAND gate circuit + Truth Table</i> <div style="text-align: right;"><i>[4 + 2 + 2]</i></div>	8
2	a	<b>With the help of block diagram, explain the microcontroller based stepper motor control system</b> <i>Ans) Block diagram + Working principle + Explanation</i> <div style="text-align: right;"><i>[3 + 3 + 6]</i></div>	12
<b>PART 2</b>			
3	a	<b>Differentiate between Resistance thermometers, Thermistor</b> <i>Ans) 3 differences</i> <div style="text-align: right;"><i>[2+2+2]</i></div>	6
	b	<b>Explain NOR gate latch with the help truth table and circuit diagram</b> <i>Ans) Explanation + NOR gate circuit + Truth table</i> <div style="text-align: right;"><i>[2 + 2 + 2]</i></div>	6
4	a	<b>Explain the architecture of 8051 in detail</b> <i>Ans) Architecture diagram + Explanation</i> <div style="text-align: right;"><i>[4 + 4]</i></div>	8
	b	<b>Write the differences between active and passive transducers</b> <i>Ans) 4 differences</i> <div style="text-align: right;"><i>[1 + 1 + 1 + 1]</i></div>	4
<b>PART 3</b>			
5	a	<b>An audio frequency signal <math>10 \sin(2\pi 500t)</math> is used to amplitude modulate carrier of <math>10 \sin(2\pi \times 10^5 t)</math> Calculate i) Modulation index ii) Sideband frequencies iii) Bandwidth iv) Amplitude of each sideband v) carrier power vi) Total sideband power vii) Total power delivered viii) Transmission efficiency</b> <i>Ans) Modulation Index = 1 or 100%</i> <i>Sideband frequencies = 100500Hz and 99500Hz</i>	12



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		<p><i>Bandwidth = 1000Hz</i>  <i>Amplitude of side band = 5V</i>  <i>Carrier Power = 50W</i>  <i>Total side band power = 25W</i>  <i>Total power delivered = 75W</i>  <i>Transmission efficiency = 0.3333 or 33.33%</i></p> <p style="text-align: right;"><i>[1 + 2 + 1 + 2 + 2 + 2 + 1 + 1]</i></p>	
<b>6</b>	<b>a</b>	<p><b>Explain the working of LVDT with neat diagram</b>  <i>Ans) Diagram + Explanation</i></p> <p style="text-align: right;"><i>[3 + 3]</i></p>	<b>6</b>
	<b>b</b>	<p><b>Explain the working of R-S flip-flop using NOR gate with relevant circuit diagram and truth table</b>  <i>Ans) Explanation + NOR gate circuit + Truth table</i></p> <p style="text-align: right;"><i>[2 + 2 + 2]</i></p>	<b>6</b>
<b>PART 4</b>			
<b>7</b>	<b>a</b>	<p><b>Find the carrier frequency, modulating frequency, modulation index and frequency deviation of the FM wave represented by, <math>S(t) = 12 \cos(6 \times 10^8 t + 2 \sin 250t)</math></b>  <i>Ans) Carrier frequency = <math>0.9 \times 10^8</math> Hz</i>  <i>Modulating frequency = 39.78 Hz</i>  <i>Modulation Index = 2</i>  <i>Frequency Deviation = 79.56Hz</i></p> <p style="text-align: right;"><i>[2 + 2 + 1 + 1]</i></p>	<b>6</b>
	<b>b</b>	<p><b>Explain NAND gate latch with the help of truth table and circuit diagram</b>  <i>Ans) Explanation + NAND gate circuit + Truth table</i></p> <p style="text-align: right;"><i>[2 + 2 + 2]</i></p>	<b>6</b>
<b>8</b>	<b>a</b>	<p><b>Explain working principle of piezo-electric transducer with neat diagram</b>  <i>Ans) Working principle + Diagram</i></p> <p style="text-align: right;"><i>[3 + 3]</i></p>	<b>6</b>
	<b>b</b>	<p><b>Explain photoelectric transducer with neat diagram</b>  <i>Ans) Explanation + Diagram</i></p> <p style="text-align: right;"><i>[3 + 3]</i></p>	<b>6</b>
<b>PART 5</b>			
<b>9</b>	<b>a</b>	<p><b>With the basic block diagram explain the communication system</b>  <i>Ans) Block diagram + Explain each block</i></p> <p style="text-align: right;"><i>[2 + 6]</i></p>	<b>8</b>
	<b>b</b>	<p><b>What is the need for modulation? What are the applications of modulation</b></p> <p style="text-align: right;"><i>4</i></p>	<b>4</b>

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		<i>Ans) 2 needs + 2 applications</i>	
			<i>[2+2]</i>
10	a	<b>List the differences between AM and FM</b> <i>Ans) 4 Differences</i>	<b>8</b>
			<i>[2 + 2 + 2 + 2]</i>
	b	<b>Write short note on Resistive transducer</b> <i>Ans) Brief on resistive transducer</i>	<b>4</b>
			<i>[4]</i>