

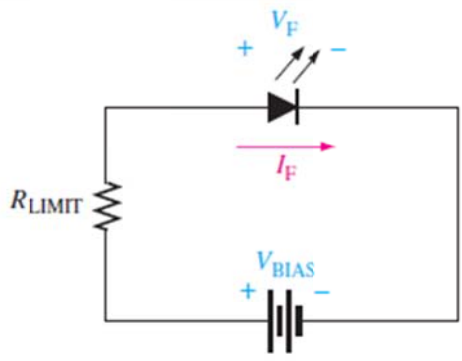
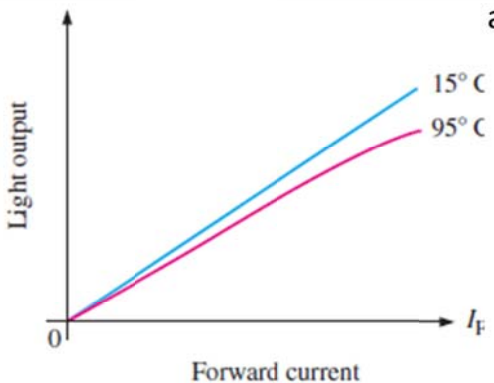
Electronic Circuits - Tutorial 06

Special Purpose Diodes

II

#	Question	
1	A zener diode can be used as a voltage regulator.	T
2	The varactor diode normally operates in forward bias.	F
3	The capacitance of a varactor varies directly with reverse voltage.	F
4	The LED is normally operated in forward bias.	T
5	The photodiode operates in reverse bias.	T
6	The light emitted by a laser diode is monochromatic.	T

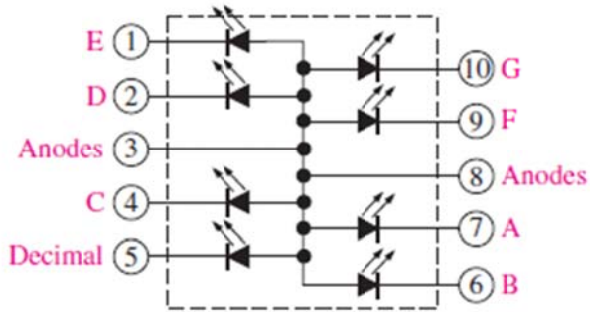
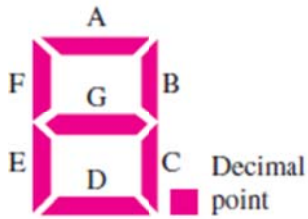
MCQ1

#	Question	
1	  <p>(a) Forward-biased operation</p> <p>(b) General light output versus forward current for two temperatures</p> <p>If the bias voltage in Figure 3–30 is increased, the light output of the LED will (a) increase (b) decrease (c) not change</p>	a
2	<p>A no-load condition means that (a) the load has infinite resistance (b) the load has zero resistance (c) the output terminals are open (d) answers(a) and (c)</p>	d
3	<p>An LED (a) emits light when reverse-biased (b) senses light when reverse-biased (c) emits light when forward-biased (d) acts as a variable resistance</p>	c
4	<p>Compared to incandescent bulbs, high-intensity LEDs (a) are brighter (b) have a much longer life (c) use less power (d) all of the above</p>	d
5	<p>An infrared LED is optically coupled to a photodiode. When the LED is turned off, the reading on an ammeter in series with the reverse-biased photodiode will (a) not change (b) decrease (c) increase (d) fluctuate</p>	b
6	<p>A laser diode produces (a) incoherent light (b) coherent light (c) monochromatic light (d) both (b) and (c)</p>	d

7	In order for a system to function properly, the various types of circuits that make up the system must be (a) properly biased (b) properly connected (c) properly interfaced (d) all of the above (e) answers(a) and (b)	d
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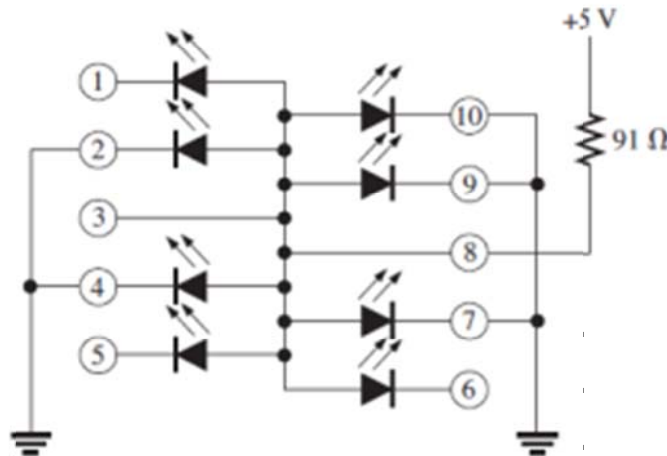
Problems:

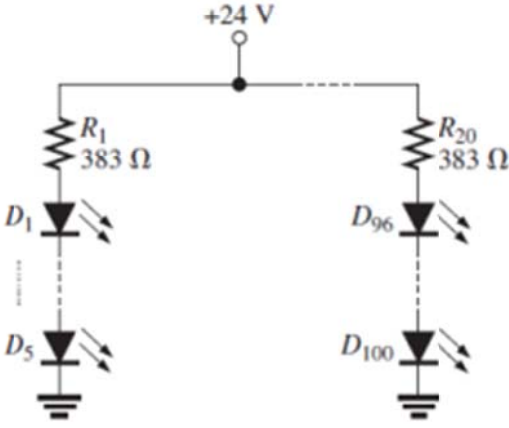
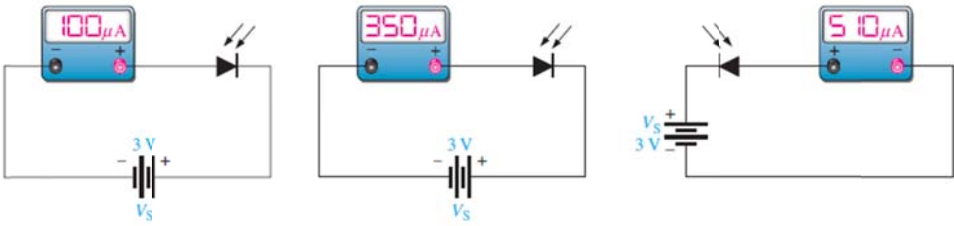
1 Determine how to connect the seven-segment display in Figure 3-74 to display "5." The maximum continuous forward current for each LED is 30 mA and a +5 V dc source is to be used.



1

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..... See Figure ANS-9.
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2	<p>Develop a yellow LED traffic-light array using a minimum number of limiting resistors that operates from a 24 V supply and consists of 100 LEDs with $I_F = 30 \text{ mA}$ and an equal number of LEDs in each parallel branch. Show the circuit and the resistor values.</p>
2	<p>..... 23. See Figure ANS-10.</p>  <p>.....</p>
3	 <p>What is the resistance of each photodiode in Figure 3-75?</p>
3	<p>..... (a) $30 \text{ k}\Omega$ (b) $8.57 \text{ k}\Omega$ (c) $5.88 \text{ k}\Omega$</p> <p>.....</p>