

Electronic Circuits Spring 2021 Mid term Exam (Time Allowed: 2 Hrs)

Please submit your answers with proper procedure on a separate sheet along with this sheet. Your answer should be rounded off to two decimal places. Each student is assigned a unique circuit value. Answers that do not correspond to the assigned values shall be considered wrong irrespective of the procedure.

Name _____

Reg. No. _____

Q1. Using the characteristics of Fig. 1a, determine I_D , V_D , and V_R for the circuit of Fig. 1b.

(For values of E and R refer to the table given at the end)

Your Response: (Marks: 5+5+5)

$I_D =$ _____ mA

$V_D =$ _____ Volts

$V_R =$ _____ Volts

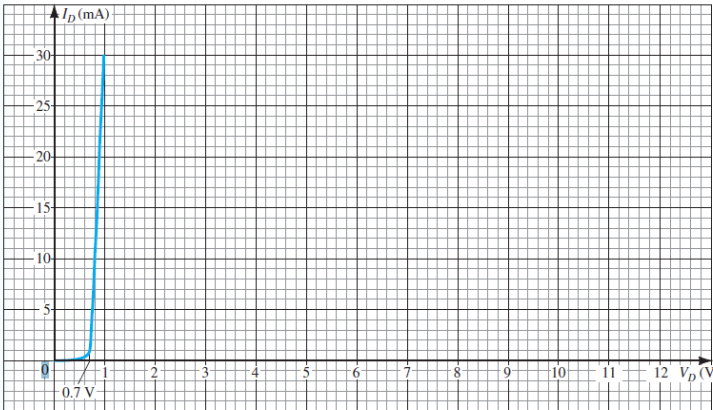


Figure 1a

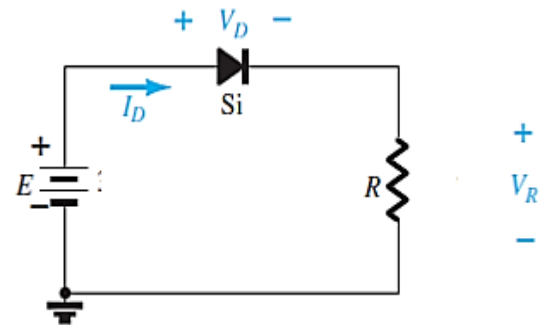


Figure 1b

Q2. Determine V_o and I_o for the networks of Fig. 2

(For values of E1 and E2 refer to the table given at the end)

Your Response: (Marks: 5+5)

$V_o =$ _____ Volts

$I_o =$ _____ mA

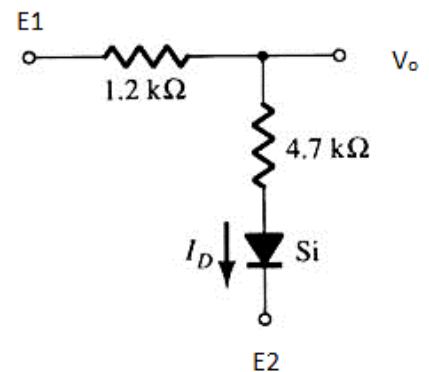


Figure 2

Q3. A full-wave bridge rectifier with a V_i (Volts) rms sinusoidal input has a load resistor of R kΩ.

- If silicon diodes are employed, what is the dc voltage available at the load?
- Determine the minimum required PIV rating of each diode (considering Si diode).
- Find the maximum current I_m through each diode during conduction.

(For values of E1 and E2 refer to the table given at the end)

Your Response:

(Marks: 5+5+5)

$V_{DC} = \underline{\hspace{2cm}}$ Volts

$PIV_{min} = \underline{\hspace{2cm}}$ mA

$I_m = \underline{\hspace{2cm}}$ mA

Q4. For the circuit shown in Fig 3, determine (a) Voltage across the capacitor V_C , (b) Peak positive output V_{O+} , (c) Peak negative output V_{O-} .

(For values of V_m and E refer to the table given at the end)

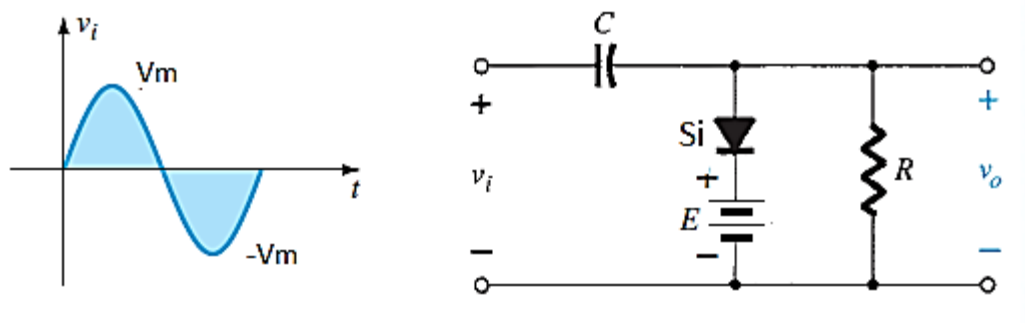


Figure 3

Your Response:

(Marks: 5+5+5)

$V_C = \underline{\hspace{2cm}}$ Volts

$V_{O+} = \underline{\hspace{2cm}}$ Volts

$V_{O-} = \underline{\hspace{2cm}}$ Volts

Q5. For the network of Figure 4, determine the range of V_i that will maintain V_L at V_Z Volts and not exceed the maximum power rating of the Zener diode.

(For values of R_S , V_Z and R_L refer to the table given at the end)

Your Response:

(Marks: 5+5)

$V_{imin} = \underline{\hspace{2cm}}$ Volts

$V_{imax} = \underline{\hspace{2cm}}$ Volts

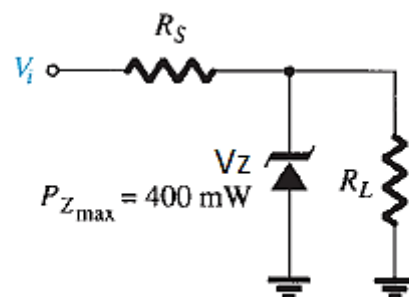


Figure 4

Appendix

Sr. No.	Registration #	Question1		Question 2		Question 3		Question 4		Question 5		
		E (Volts)	R (k Ohms)	E1 (Volts)	E2 (Volts)	Vi (rms) Volts	R (k Ohms)	Vm	E	Rs Ohms	VZ Volts	RL Ohms
1	19PWCSE1741	7	1.84	5	-10	193	0.47	146	14	93	10	1080
2	19PWCSE1743	6	1.63	13	-5	115	0.43	166	9	141	10	710
3	19PWCSE1745	10	1.81	12	-5	162	0.32	137	11	137	12	230
4	19PWCSE1747	11	1.91	7	-9	157	1.11	148	20	133	7	390
5	19PWCSE1749	10	0.97	6	-7	160	1.08	198	13	106	9	740
6	19PWCSE1750	9	0.66	14	-9	110	1.55	114	19	112	14	820
7	19PWCSE1752	6	1.62	9	-9	134	1.89	181	8	130	13	1150
8	19PWCSE1753	7	0.54	8	-7	200	1.07	146	8	133	14	450
9	19PWCSE1755	11	0.84	7	-8	177	1.1	175	18	99	13	990
10	19PWCSE1757	8	1.66	14	-8	196	1.23	104	13	122	14	960
11	19PWCSE1759	8	1.07	8	-10	171	0.34	164	10	104	12	770
12	19PWCSE1761	7	0.43	10	-5	176	1.75	122	10	118	15	420
13	19PWCSE1763	5	1.65	13	-9	149	0.82	144	12	143	13	890
14	19PWCSE1765	7	1.03	14	-5	127	0.87	115	10	102	13	1120
15	19PWCSE1767	12	1.01	11	-9	127	0.89	173	9	115	12	1050
16	19PWCSE1770	6	0.23	14	-8	159	1.17	109	14	108	14	1150
17	19PWCSE1772	12	0.98	12	-5	129	0.42	105	10	150	8	440
18	19PWCSE1774	12	0.71	10	-6	161	0.67	178	11	121	7	360
19	19PWCSE1776	8	1.98	10	-8	192	0.55	109	9	145	14	740
20	19PWCSE1778	7	1.37	14	-7	163	0.82	146	19	113	7	560
21	19PWCSE1781	10	0.68	9	-7	197	1.06	118	16	128	9	1090
22	19PWCSE1783	5	1.01	13	-6	126	0.61	176	6	101	15	800
23	19PWCSE1786	9	1.54	7	-9	191	1.54	157	18	129	11	810
24	19PWCSE1788	7	1.46	13	-5	198	1.53	196	15	135	11	340
25	19PWCSE1790	9	0.98	5	-7	139	2	161	11	128	8	880
26	19PWCSE1792	11	1.69	10	-10	132	0.5	105	11	142	7	1180
27	19PWCSE1794	6	1.76	12	-6	119	1.83	122	6	130	10	400
28	19PWCSE1796	5	1.3	11	-8	156	0.25	192	14	139	12	290
29	19PWCSE1797	5	1.66	6	-8	186	1.91	140	5	120	11	360
30	19PWCSE1799	6	1.07	15	-6	166	0.6	184	11	137	9	800
31	19PWCSE1801	8	0.58	10	-10	105	1.53	187	16	99	9	1080
32	19PWCSE1802	9	0.86	7	-9	191	1.2	137	9	130	9	680
33	19PWCSE1804	11	0.16	6	-10	164	0.13	129	16	145	11	970
34	19PWCSE1806	6	0.94	10	-10	158	1.23	189	9	143	9	1200

35	19PWCSE1807	10	0.3	15	-6	200	0.22	143	11	138	13	590
36	19PWCSE1809	9	0.52	6	-7	102	0.79	149	19	149	10	910
37	19PWCSE1811	8	0.69	15	-6	170	1.56	133	15	91	7	930
38	19PWCSE1812	5	0.28	5	-9	122	1.69	158	12	121	14	450
39	19PWCSE1814	8	1.44	10	-8	163	0.26	163	5	146	7	1070
40	19PWCSE1740	9	0.58	8	-10	127	0.22	168	18	130	11	660
41	19PWCSE1742	11	1.63	7	-8	110	1.01	132	10	106	14	460
42	19PWCSE1744	8	0.55	9	-10	169	1.92	168	18	92	11	1110
43	19PWCSE1746	7	0.39	14	-9	111	0.4	104	18	128	12	710
44	19PWCSE1748	6	0.71	15	-8	159	0.65	194	12	103	13	480
45	19PWCSE1751	7	0.41	14	-8	163	0.72	198	7	103	12	640
46	19PWCSE1754	10	0.54	15	-9	123	0.45	147	19	140	7	840
47	19PWCSE1756	12	1.78	5	-10	156	0.89	174	19	138	7	1130
48	19PWCSE1758	5	0.86	12	-6	187	0.38	135	18	115	15	900
49	19PWCSE1760	11	1.58	6	-8	131	0.9	139	13	130	11	520
50	19PWCSE1762	5	1.99	13	-9	116	1.19	153	20	91	15	510
51	19PWCSE1764	10	1.66	10	-8	188	0.93	187	11	137	9	1100
52	19PWCSE1766	7	1.45	9	-6	124	1.95	189	7	138	9	470
53	19PWCSE1768	7	0.51	14	-9	154	0.66	144	7	139	12	460
54	19PWCSE1769	9	1.76	6	-5	121	1.02	133	20	110	10	660
55	19PWCSE1771	10	1.76	6	-9	143	1.79	140	15	95	11	850
56	19PWCSE1773	8	1.16	8	-7	196	0.89	167	7	111	8	500
57	19PWCSE1775	9	1.29	8	-9	173	0.11	107	13	148	9	410
58	19PWCSE1777	11	0.7	13	-8	192	0.68	158	6	132	15	650
59	19PWCSE1779	10	0.41	6	-10	145	1.6	138	18	130	12	1080
60	19PWCSE1780	5	1.56	6	-8	175	1.27	136	18	134	13	750
61	19PWCSE1782	10	1.94	8	-8	173	0.77	159	7	137	15	560
62	19PWCSE1784	10	1.91	13	-5	150	0.99	120	7	147	11	680
63	19PWCSE1785	8	1.78	15	-5	139	0.75	169	20	101	7	440
64	19PWCSE1787	11	1.3	13	-6	145	0.31	142	19	148	9	870
65	19PWCSE1789	10	1.58	8	-10	194	1.23	134	17	126	11	350
66	19PWCSE1791	6	1.2	7	-5	167	0.93	100	15	132	13	580
67	19PWCSE1793	7	0.6	6	-9	141	0.11	177	5	98	12	610
68	19PWCSE1795	7	1.54	15	-9	111	1.64	143	6	99	14	280
69	19PWCSE1798	7	0.48	7	-10	140	1.22	166	5	92	9	890
70	19PWCSE1800	8	1.79	6	-7	100	0.49	106	15	130	15	540
71	19PWCSE1803	12	1.51	8	-9	183	1.24	133	7	142	7	640
72	19PWCSE1805	7	0.52	11	-10	200	0.06	173	13	97	11	640
73	19PWCSE1808	8	1.3	9	-9	199	0.2	135	11	107	12	1200
74	19PWCSE1810	12	0.52	13	-6	138	1.92	162	9	132	9	850
75	19PWCSE1813	6	0.55	10	-10	198	1.5	172	16	97	9	260

76	19PWCSE1815	6	0.19	8	-7	150	0.74	133	13	143	10	1110
77	19PWCSE1816	5	0.27	10	-8	100	1.3	165	10	145	9	330
78	19PWCSE1858	12	1.58	13	-10	197	1.6	115	11	149	11	1130
79	18PWCSE1716	5	0.9	13	-8	198	1.97	190	7	101	13	560
80	19PWCSE1818	8	1.43	11	-6	190	1.41	200	5	112	11	650
81	19PWCSE1819	8	0.33	6	-5	103	1	197	14	127	8	740
82	19PWCSE1820	5	1.05	14	-8	134	1.32	151	7	149	15	690
83	19PWCSE1821	12	1.63	6	-6	180	0.22	112	9	91	8	940
84	19PWCSE1822	7	1.07	13	-9	100	1.98	103	19	93	10	1140
85	19PWCSE1823	10	1.72	7	-8	164	0.68	182	17	148	11	980
86	19PWCSE1824	11	0.44	14	-5	133	1.67	121	20	90	14	210
87	19PWCSE1825	11	1.02	15	-7	181	0.34	195	18	108	15	820
88	19PWCSE1826	12	0.72	13	-9	132	1.43	171	16	102	13	370
89	19PWCSE1827	11	1.41	12	-9	153	0.53	111	10	115	12	940
90	19PWCSE1828	6	0.88	11	-5	141	1.15	196	15	111	7	570
91	19PWCSE1829	8	0.65	10	-6	115	1.23	199	11	90	11	870
92	19PWCSE1830	11	1.32	10	-9	153	0.37	196	15	124	15	340
93	19PWCSE1831	6	1.82	13	-9	182	1.88	167	17	96	7	380
94	19PWCSE1832	12	1	14	-5	143	1.58	185	11	145	10	980
95	19PWCSE1833	5	1.2	7	-7	196	0.9	192	20	120	15	520
96	19PWCSE1834	6	1.99	13	-7	171	1.31	172	6	114	9	710
97	19PWCSE1835	5	0.17	6	-8	108	1.75	194	19	94	13	480
98	19PWCSE1836	6	0.18	7	-10	163	0.63	191	5	123	14	470
99	19PWCSE1837	10	0.54	15	-6	129	1	163	19	140	14	570
100	19PWCSE1838	6	0.61	5	-7	199	0.84	137	7	102	7	870
101	19PWCSE1839	8	1.54	14	-9	161	1.32	178	9	90	8	600
102	19PWCSE1840	11	0.93	15	-5	189	0.32	184	18	101	10	350
103	19PWCSE1841	5	1.63	5	-10	169	0.97	175	13	119	9	270
104	19PWCSE1842	6	0.84	5	-9	104	0.27	172	8	99	10	380
105	19PWCSE1843	7	0.61	14	-6	139	1.93	109	14	128	15	320
106	19PWCSE1844	7	1.6	12	-6	167	2	163	10	140	9	750
107	19PWCSE1845	10	0.16	15	-5	149	0.17	131	14	136	8	390
108	19PWCSE1846	11	0.62	5	-10	157	1.05	183	6	110	14	1080
109	19PWCSE1847	9	1.18	15	-6	141	0.22	118	16	140	11	300
110	19PWCSE1848	5	0.43	5	-9	155	0.19	124	10	146	13	590
111	19PWCSE1849	11	0.39	6	-9	116	1.94	123	5	150	15	440
112	19PWCSE1850	7	0.37	6	-8	200	1.31	176	5	109	11	510
113	19PWCSE1851	9	0.41	5	-9	173	1.49	121	10	141	8	710
114	19PWCSE1852	6	0.58	11	-5	147	0.85	166	19	96	9	940
115	19PWCSE1853	11	0.53	10	-8	145	1.78	194	16	124	11	210
116	19PWCSE1854	12	1.34	12	-6	139	0.68	194	6	122	13	1040

117	19PWCSE1855	6	0.81	10	-6	111	1.1	126	9	114	15	710
118	19PWCSE1856	6	0.57	6	-9	107	0.89	136	9	121	10	880
119	19PWCSE1857	6	1.6	12	-6	160	1.84	194	17	90	12	650
120	15pwcse1368	12	1.84	9	-9	100	0.97	172	18	112	14	490
121	16pwcse1450	11	1.63	8	-5	164	0.27	105	8	93	7	750
122	15pwcse1366	6	1.81	7	-10	133	1.93	189	5	127	10	400
123	17pwcse1603	8	1.91	14	-9	181	2	122	7	149	7	950
124	16pwcse1465	11	0.97	8	-6	132	0.17	143	20	121	11	610
125	16pwcse1477	6	0.66	10	-6	153	1.05	132	19	141	7	350
126	17pwcse1575	12	1.62	13	-5	141	0.22	114	13	120	12	250
127	17pwcse1602	5	0.54	14	-10	115	0.19	185	8	124	8	620
128	17pwcse1554	6	0.84	11	-6	153	1.94	171	11	101	7	1020
129	16pwcse1496	5	1.66	14	-9	182	1.31	158	8	129	7	290
130	17pwcse1587	6	1.07	12	-9	143	1.49	116	5	118	8	590
131	17pwcse1500	10	0.43	10	-8	196	0.85	187	20	91	13	440
132	16pwcse1490	6	1.65	10	-9	171	1.78	117	18	102	8	320
133	17pwcse1516	8	1.03	14	-5	108	0.68	141	13	102	10	580