

Bonds Handout - Solution

Ewing Corp issued \$4.0M worth of 20-year bonds on January 1st, 2013. The bond requires semiannual interest payments (on January 1st and July 1st) with an interest rate of 5%. The market rate was 5% at the time of the issuance.

1. Did Ewing receive any more or less than the face value of the bonds? Why or why not?
2. How much will Ewing pay in interest when the first payment is due?
3. Assume Ewing's fiscal year ends on December 31st. Assume Ewing's fiscal year ends on December 31st. How much is interest expense and interest payable on the 31st?

Solutions

1. *They received cash equal to the face value of the bond. This is because the bond was issued at an interest rate equal to the market rate*
2. *$(4,000,000 * .05 * .5) = \$100,000$*
3. *Interest Expense = 200,000 and Interest Payable = 100,000*

On January 1st, 2013 Kemp Industries issued \$20M of 15-year 7% semiannual bonds. The market rate at the time of the issuance was 9%.

1. Were the bonds issued at a premium or a discount? How do you know?
2. Suppose Kemp received \$16,742,222 for the bonds. How would the bonds payable appear on the balance sheet?
3. The first interest payment is due July 1st. How much will Kemp pay in interest?
4. How much is interest expense and how much is the amortization of the discount/premium for the period ended June 30th, 2013 using the effective interest method?

Solutions:

1. *Discount. You know this because the interest rate on the bond was lower than the market rate.*
- 2.

<i>Bonds Payable</i>	<i>\$20,000,000</i>
<i>Less: Discount on Bonds Payable</i>	<i><u>(\$3,257,778)</u></i>
<i>Net Carrying Value</i>	<i>\$16,742,222</i>

3. $\$20,000,000 \times .07 \times 6/12 = \$700,000$
4. *Interest Expense = \$753,400 (\$16,742,222 X .045) and the amortization of the Discount on Bonds Payable = \$53,400 (\$753,400-\$700,000)*

On January 1st, 2013, Nicklaus Corp issued \$5M of 10-year 6% semiannual bonds. The market rate at the time of the issuance was 4%. The bonds makes interest payments on January 1 and July 1.

1. Did Nicklaus receive more or less cash than the face value of the bonds? By how much?
2. Assuming a December 31st fiscal year end, how much was interest paid in 2013?
3. What will the total interest expense be over the life of the bond?
4. How much was interest expense in 2013 (round to the nearest dollar)?

Solution

1. More. They received $\$5,000,000 * 0.67297$ or $\$3,364,850$ for the principal plus $\$150,000 * 16.35143$ or $\$2,452,715$ for the interest payments. In total, they receive $\$5,817,565$. This is greater than the face value of the bond.
2. Interest paid in 2013 totaled $(\$5,000,000 * .06 * .5) = \$150,000$. This is equal to the interest paid on July 1, 2013. Remember, the interest paid for the second six months was paid on January 1, 2014.
3. The total interest payments for the life of the bond will be $(\$5,000,000 * .03 * 20) = \$3,000,000$. However, because the bonds were issued at a premium, you must subtract the amount of the premium from the total interest paid to get interest expense. Therefore over the life of the bond, the total interest expense will be $\$3,000,000 - \$817,565 = \$2,182,435$.
4. 2013 Interest expense = $\$116,351 + \$115,678 = \$232,030$.

periods	carrying value	interest expense	interest paid	amortization
1	\$5,817,565	\$116,351	\$150,000	\$33,649
2	\$5,783,916	\$115,678	\$150,000	\$34,322
		\$232,030		

Periods	PRESENT VALUE OF ORDINARY ANNUITY (annuity in arrears -- end of period)									
	RATE PER PERIOD									
	0.25%	0.50%	0.75%	1.00%	1.50%	2.00%	2.50%	3.00%	4.00%	5.00%
1	0.99751	0.99502	0.99256	0.99010	0.98522	0.98039	0.97561	0.97087	0.96154	0.95238
2	1.99252	1.98510	1.97772	1.97040	1.95588	1.94156	1.92742	1.91347	1.88609	1.85941
3	2.98506	2.97025	2.95556	2.94099	2.91220	2.88388	2.85602	2.82861	2.77509	2.72325
4	3.97512	3.95050	3.92611	3.90197	3.85438	3.80773	3.76197	3.71710	3.62990	3.54595
5	4.96272	4.92587	4.88944	4.85343	4.78264	4.71346	4.64583	4.57971	4.45182	4.32948
6	5.94785	5.89638	5.84560	5.79548	5.69719	5.60143	5.50813	5.41719	5.24214	5.07569
7	6.93052	6.86207	6.79464	6.72819	6.59821	6.47199	6.34939	6.23028	6.0205	5.78637
8	7.91074	7.82296	7.73661	7.65168	7.48593	7.32548	7.17014	7.01969	6.73274	6.46321
9	8.88852	8.77906	8.67158	8.56602	8.36052	8.16224	7.97087	7.78611	7.43533	7.10782
10	9.86386	9.73041	9.59958	9.47130	9.22218	8.98259	8.75206	8.53020	8.11090	7.72173
11	10.83677	10.67703	10.52067	10.36763	10.07112	9.78685	9.51421	9.25262	8.76048	8.30641
12	11.80725	11.61893	11.43491	11.25508	10.90751	10.57534	10.25776	9.95400	9.38507	8.86325
13	12.77532	12.55615	12.34235	12.13374	11.73153	11.34837	10.98318	10.63496	9.96565	9.39357
14	13.74096	13.48871	13.24302	13.00370	12.54338	12.10625	11.69091	11.29607	10.56312	9.89864
15	14.70420	14.41662	14.13699	13.86505	13.34323	12.84926	12.38138	11.93794	11.11839	10.37966
16	15.66504	15.33993	15.02431	14.71787	14.13126	13.57771	13.05500	12.56110	11.65230	10.83777
17	16.62348	16.25863	15.90502	15.56225	14.90765	14.29187	13.71220	13.16612	12.16567	11.27407
18	17.57953	17.17277	16.77918	16.39627	15.67256	14.99203	14.35336	13.75351	12.65930	11.68959
19	18.53320	18.08296	17.64683	17.22601	16.42617	15.67846	14.97889	14.32380	13.13394	12.08532
20	19.48449	18.98742	18.50802	18.04555	17.16864	16.35143	15.58916	14.87747	13.59033	12.46221

Periods	PRESENT VALUE OF \$1										
	RATE PER PERIOD										
	0.25%	0.50%	0.75%	1.00%	1.50%	2.00%	2.50%	3.00%	4.00%	5.00%	6.00%
1	0.99751	0.99502	0.99256	0.99010	0.98522	0.98039	0.97561	0.97087	0.96154	0.95238	0.9434
2	0.99502	0.99007	0.98517	0.98030	0.97066	0.96117	0.95181	0.94260	0.92456	0.90703	0.8900
3	0.99254	0.98515	0.97783	0.97059	0.95632	0.94232	0.92860	0.91514	0.88900	0.86384	0.8396
4	0.99006	0.98025	0.97055	0.96098	0.94218	0.92385	0.90595	0.88849	0.85480	0.82270	0.7920
5	0.98759	0.97537	0.96333	0.95147	0.92826	0.90573	0.88385	0.86261	0.82193	0.78353	0.7472
6	0.98513	0.97052	0.95616	0.94205	0.91454	0.88797	0.86230	0.83748	0.79031	0.74622	0.7049
7	0.98267	0.96569	0.94904	0.93272	0.90103	0.87056	0.84127	0.81309	0.75992	0.71068	0.6650
8	0.98022	0.96089	0.94198	0.92348	0.88771	0.85349	0.82075	0.78941	0.73069	0.67684	0.6274
9	0.97778	0.95610	0.93496	0.91434	0.87459	0.83676	0.80073	0.76642	0.70259	0.64461	0.5919
10	0.97534	0.95135	0.92800	0.90529	0.86167	0.82035	0.78120	0.74409	0.67556	0.61391	0.5583
11	0.97291	0.94661	0.92109	0.89632	0.84893	0.80426	0.76214	0.72242	0.64958	0.58468	0.5267
12	0.97048	0.94191	0.91424	0.88745	0.83639	0.78849	0.74356	0.70138	0.62460	0.55684	0.4969
13	0.96806	0.93722	0.90743	0.87866	0.82403	0.77303	0.72542	0.68095	0.60057	0.53032	0.4688
14	0.96565	0.93256	0.90068	0.86996	0.81185	0.75788	0.70773	0.66112	0.57748	0.50507	0.4423
15	0.96324	0.92792	0.89397	0.86135	0.79985	0.74301	0.69047	0.64186	0.55526	0.48102	0.4172
16	0.96084	0.92330	0.88732	0.85282	0.78803	0.72845	0.67362	0.62317	0.53391	0.45811	0.3936
17	0.95844	0.91871	0.88071	0.84438	0.77639	0.71416	0.65720	0.60502	0.51337	0.43630	0.3713
18	0.95605	0.91414	0.87416	0.83602	0.76491	0.70016	0.64117	0.58739	0.49363	0.41552	0.3503
19	0.95367	0.90959	0.86765	0.82774	0.75361	0.68643	0.62553	0.57029	0.47464	0.39573	0.3305
20	0.95129	0.90506	0.86119	0.81954	0.74247	0.67297	0.61027	0.55368	0.45639	0.37689	0.3118