## EASTERN UNIVERSITY, SRI LANKA FACULTY OF COMMERCE AND MANAGEMENT

## Third Year First Semester Examination in Bachelor of Commerce/ Bachelor of

Commerce (Specialization in Accounting and Finance)-2012/2013(February 2015) (Proper/ Repeat/ Re-Repeat) DAF 3043 Corporate Finance

Answer All Questions.<br>Calculator Permitted.<br>Use Table Attached.

Time: Three (03) hours.

1. (I) "A strong financial result and financial position of a company will essentially secure its future survival". Critically assess the above statement with supportive evidence from Sri Lankan context.
(04 Marks)
(II) Discuss the objectives and the limitations of accounting ratio analysis as a tool of financial statement analysis.
(04 Marks)
(III) The statement of income and the statement of financial position of Lanka Text for the year 2014 are given below.

Statement of Income for the year ended $31^{\text {st }}$ March 2014

|  | Rs. ${ }^{\circ} 000$ |
| :--- | ---: |
| Sales | 80,000 |
| Cost of Sales | $(32,000)$ |
| Gross profit | 48,000 |
| Distribution Cost | $(16,000)$ |
| Administrative expenses | $(8,000)$ |
| Interest | $(4,000)$ |
| Profit before tax | 20,000 |
| Tax expenses | $(4,000)$ |
| Profit after tax | 16,000 |

## Statement of Financial Position as at $31^{\text {st }}$ March 2014

|  | Rs. ${ }^{\prime} 000$ |
| :--- | ---: |
| Property plant and equipment | 62,000 |
| Inventory | 2,000 |
| Trade Debtors | 8,000 |
| Cash and bank | 2,000 |
| Total assets | $\mathbf{7 4 , 0 0 0}$ |
| Stated capital | 25,000 |
| Retained profit | 30,000 |
| Bank loan | 13,000 |
| Trade payables | 6,000 |
| Equity and total liabilities | $\mathbf{7 4 , 0 0 0}$ |

Following accounting ratios are available for the prior period (2013)

| Gross profit ratio | $50 \%$ |
| :--- | :--- |
| Current ratio | $3.5: 1$ |
| Quick asset ratio | $0.6: 1$ |
| Inventory turnover | 8 times |
| Debtor's turnover | 7 times |
| Interest coverage | 4 times |

## Required:

(i) Compute the ratios for the year 2014 equivalent for those given for the prior period
(ii) Give two possible reasons for the each variations, if any, in following ratios:
(a) Gross profit ratio
(b) Inventory turnover ratio
(iii) Comment on the firm's short term and long term financial position
02. (I) XYZ bank pays $15 \%$ compound interest quarterly. If Rs. 1000 is deposited initially, how much shall it grow at the end of 5 years?
(II) How long will it take to double Rs. 1000 if it grows at $15 \%$ annually?
(III) A person bought a share 15 years ago for Rs.10. it is now selling for Rs.27.60. What is the compound growth rate in the price of the share?
(IV) A person is borrowing Rs. 50000 to buy a low-income group house. If he pays equal installments for 25 years and $4 \%$ interest on outstanding balance, what is the amount of installment? What shall be the amount of installment if quarterly payments are required to be made?
(V) A company has issued debentures of Rs. 5000000 to be repaid after 7 years. How much should the company invest in a sinking fund earning $12 \%$ in order to be able to repay debentures?
(VI) A bank has offered to you an annuity of Rs. 1800 for 10 years if your invest Rs. 12000 today. What rate of return would you earn?
(Total 20 Marks)
03. The $S$ plc and the $M$ plc have the following probability distribution of returns from their securities:

| Economic Conditions | Probability | Returns |  |
| :--- | :---: | :---: | :---: |
|  |  | S plc | M plc |
| High growth | 0.1 | 32 | -30 |
| Normal growth | 0.2 | 20 | -17 |
| Slow growth | 0.4 | 14 | 06 |
| Stagnation | 0.2 | -5 | 12 |
| Decline | 0.1 | -10 | 16 |

## Required:

Calculate the following:
(i) Calculate the Expected Rate of Return of security $S$ and security $M$.
(ii) Measure the Risk of investing in each of the securities by finding the Sta deviation of returns of each security and comment on the risk measured.
(iii) Calculate (a) the Covariance of Returns and (b) the Correlation Coefficient of R between $S$ and $M$ and explore the possibility of reducing the risk by creating a po investing in both securities.
(iv) If a portfolio is created by investing $70 \%$ of wealth in security S and $30 \%$ in secur what will be the Expected Rate of Return of the Portfolio?
(v) Measure the Risk of the Portfolio by calculating its Standard Deviation of its re and comment on the risk of the portfolio.
(vi) Determine the optimal combination of $S$ and $M$ to form minimum risk portfolio.
04. A company is considering the following investment projects:

| Projects | Cash flows (Rs.) |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | C $_{0}$ | C $_{1}$ | C $_{2}$ | C $_{3}$ |
| A | -15000 | +20000 |  |  |
| B | -15000 | +15000 | +7500 |  |
| C | -15000 | +4000 | +4000 | +12000 |
| D | -15000 | +10000 | +3000 | +3000 |

## Required:

(I) Calculate the following assuming discount rate of $12 \%$.
(a) NPV
(b) $\operatorname{IRR}$
(c) ARR
(d) Discounted Payback
(II) Assuming the projects are independent, which one should be accepted?
(III) If the projects are mutually exclusive, which project is the best?
05. (a) List four key underlying assumption of Cost-Volume-Profit (CVP) analysis.
(04 marks)
(b) Discuss the advantages of CVP analysis for an organization.
(04 marks)
(c) KPL plc intends to make and sell four products and has prepared a budget for the next twelve months. Details of forecasts are shown below:

| Product | W | X | Y | Z |
| :--- | :---: | :---: | :---: | :---: |
| Sales Value (Rs.'000) | 1000 | 500 | 400 | 600 |
| Variable Cost (Rs.'000) | 600 | 600 | 300 | 450 |

Budgeted fixed costs are RS.250,000 per annum and total assets employed are Rs.570,000.

## Required:

(i) Calculate the total contribution earned by each product and their combined profit volume ratio.
(03 marks)
(ii) Prepare a profit - volume chart and show the break-even sales value if this company is producing in the most profitable way (use a graph paper).
(06 marks)
(iii) Describe briefly three ways in which the overall contribution to sales ratio could be improved.
(03 marks)
(Total 20 Marks)

Table A-3 Present Value Interest Factors for One Dollar Discounted at: $k$ Percent for $n$ Poriods: $p / W F_{k, n}=1 /(1+k)^{2}$

| Period | 1\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | 8\% |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 0.9901 | 0.9804 | 0.9709 | 0.9615 | 0.9524 | 0.9438 | 0.9346 | 0.9259 | 0.98174 | 10\% | 11\% | 12\% | 13\% | 14\% | 15\% | 16\% | 20\% | 24\% | 25\% | 30\% |
| 2 | 0.9803 | 0.9612 | 0.9426 | 0.9246 | 0.9070 | 0.8900 | 0.8734 | 0.85573 | 0.9774 | 0.9094 | 0.9009 | 0.8929 | 0.8850 | 13772 | 0.8696 | 0.8521 | 0.8333 | 0.8065 | 0.3000 | 0.7692 |
| 3 | 0.9706 | 0.9423 | 0.9151 | 0.8890 | 0.8638 | 0.8396 | 0.8163 | 0.8573 | 0.8417 | 0.826 a | 0.8116 | 0.7972 | 0.7831 | 67695 | 0.7589 | 0.7432 | 0.6946 | 0.6504 | 0.6400 | $0.591{ }^{7}$ |
| 4 | 0.9610 | 0.9238 | 0.8885 | 0.9548 | 0.8227 | 0.7921 | 0.7629 | 0.7350 | 0.7122 | 0.7513 | 0.1312 | 0.7118 | 0.6934 | 0.6750 | 0.6676 | 0.6407 | 0.5787 | 0.8245 | 0.5120 | 0.455: |
| 5 | 0.9515 | 0.9057 | 0.8626 | 0.8219 | 0.7835 | 0.7473 | 0.7130 | 0.88806 | 0.6489 | $\frac{0.6830}{0.6209}$ | 0.6587 | 0.6355 | 0.6133 | 0.5929 | 0.5738 | 0.5523 | 0.4823 | 0.4230 | 0.4096 | 0.350 ? |
|  |  |  |  |  |  | - | 0.7130 | 0.8806 | 0.6489 | 0.6209 | 0.5935 | 0.5674 | 0.5428 | 0.5194 | 0.4972 | 0.4761 | 0.4019 | 0.3414 | 0.3277 | 0.2692 |
| 6 | 0.9420 | 0.8880 | 0.8375 | 0.7903 | 0.7462 | 0.7050 | 0.6683 | 0.6302 |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | 0.9327 | 0.8706 | 0.8131 | 0.7599 | 0.7107 | 0.6651 | 0.6227 | 0.5835 | 0.54 | 0.5645 | 0.5845 | 0.5066 | 0,4803 | 0.4556 | 0.4323 | 0.8104 | 0.3349 | 0.2751 | 0.2629 | 0.2072 |
| 8 | 0.9235 | 0.8535 | 0.7894 | 0.7307 | 0.6768 | 0.6274 | 0.5829 | 0.6403 | 0.5019 | 0.4665 | 0.4817 | 0.4523 | 0.4251 | 0.3996 | 0.3753 | 0.3538 | 0.2791 | 0.2218 | B. 2097 | 0.9594 |
| 9 | 0.9143 | 0.8368 | 0.7664 | 0.7026 | 0.6446 | 0.5919 | 0.5438 | 0.5002 | 0.4804 | 0.42841 | 0.4339 | 0.4039 | 0.3762 | 0.3508 | 2.3259 | 0.3050 | B. 2326 | 0.1789 | 0.1878 | 0.1226 |
| 10 | 0.9053 | 0.8203 | 0.7441 | 0.6756 | 0.6138 | 0.5584 | 0.5083 | 0.4632 | 0.4224 | 0.3855 |  | 0.3220 | 0.3329 | 0.3075 | 0.28 | 0.2630 | 0.4938 | 0.1443 | 0.1342 | 0.0843 |
|  |  |  |  |  |  |  |  |  |  |  | 0.35 | 0.3220 | 0.2946 | 0.2697 | 0.2472 | 6.2267 | 0.16:5 | 0.1154 | 0.10:4 | 0.0725 |
| 11 | 0.8963 | 0.8043 | 0.7224 | 0.64 .96 | 0.5847 | 0.5388 | 0.4781 | 0.4289 | 0.3875 | 0.3505 |  |  |  |  |  |  |  |  |  |  |
| 12 | 0.8874 | 0.7885 | 0.7014 | 0.6246 | 0.5568 | 0.48870 | 0.48440 | 0.3571 | 0.3875 | 0.3505 | 0.3173 |  | 9.2607 | 35 | 0.2143 | 0.1854 | 0.8346 | 0.0938 | 0.0858 | 0.0558 |
| 13 | 0.8787 | 0.7730 | 0.6810 | 0.6006 | 0.5303 | 0.4688 | 0.4150 | 0.3677 | 0.3555 | 0 | $\frac{0.2859}{0.3575}$ | 0.2567 | 43 | 0.2076 | 0.1869 | 0.1685 | 0.1122 | 0.0757 | 0.0687 | 0.0429 |
| 14 | 0.8700 | 0.7579 | 0.6611 | 0.5775 | 0.5051 | 0.4483 | 0.3878 | 0.3405 | 0.3262 | 0.2897 | 0.3575 | 0.2292 | 0.2042 | $\frac{0.1821}{0.1597}$ | 0.1625 | 0.1452 | 0.0935 | 0.0610 | 0.0550 | 0.0330 |
| 15 | 0.8613 | 0.7430 | 0.6419 | 0.5553 | 0.4810 | 0.4173 | 0.3624 | 0.3152 | 0.7745 | 0.2394 | 0.200 | 0.2046 | 0.1807 | 0.1597 | 0.1613 | 0.1252 | 0.0779 | 0.0482 | 0.0440 | 0.0254 |
|  |  |  |  |  |  |  |  | 0.5152 | 0.8745 | 0.2396 | 0.209 | 0.1327 | 0.1599 | 0.8409 | 0.1229 | 0.1079 | 0.0649 | 0.0397 | 0.0352 | 0.0195 |
| 16 | 0.8528 | 0.7284 | 0.6232 | 0.5339 | 0.4581 | 0.3936 | 0.3387 | 0.2919 | 0.2549 | 0.2176 |  |  |  |  |  |  |  |  |  |  |
| 17 | 0.8444 | 0.7142 | 0.6050 | 0.5134 | 0.4363 | 0.3714 | 0.3166 | 0.2703 | 0.2311 | 0.2176 | 0.1883 | 0.1531 | 0.1415 | 0.1229 | 0.1069 | 0.0930 | 0.0549 | 0.0320 | 0.0231 | 3.0460 |
| 18 | 0.8360 | 0.7002 | 0.5874 | 0.4936 | 0.4155 | 0.3503 | 0.2953 | 0.2502 | 0.2120 | $\frac{0.1799}{}$ | 0.8528 | 0.8456 | 0.1252 | 0.1078 | 2.0329 | 0.0802 | 0.0451 | 0.0258 | 0.0225 | 40116 |
| 19 | 0.8277 | 0.6864 | 0.5703 | 0.4746 | 0.3957 | 0.3305 | 0.2765 | 0.2317 | 0.9345 | 0.1335 | $\frac{0.1528}{0.13 \% 7}$ | 0.1500 |  | 946 | 0.0808 | 0.0881 | 0.0376 | 0.0208 | 0.0180 | 0.1089 |
| 20 | 0.8195 | 0.6730 | 0.5537 | 0.4564 | 0.3769 | 0.3118 | 0.2584 | 0.2145 | 0.1784 | 0.1486 | 0.1240 | 0.103 | 0.08 |  | 0.0703 | 0.0586 | 0,0313 | 0.0168 | 0.0144 | 0.11058 |
|  |  |  |  |  |  |  |  |  |  |  |  |  | , 0.00 | 0.0728 | 0.0611 | 0.0514 | 0.0281 | 0.0135 | 0.015 | 0.0053 |
| 21 | 0.8114 | 0.6598 | 0.5375 | 0.4388 | 0.3589 | 0.2942 | 0.2415 | 0.1987 | 0.9637 | 0.1351 | 0.11 |  |  |  |  |  |  |  |  |  |
| 22 | 0.8034 | 0.6468 | 0.5219 | 0.4220 | 0.3418 | 0.2775 | 0.2257 | 0.1839 | 0.1502 | 0.1228 | 0.112 |  |  |  | 0.0531 | 0.0443 | 0.0217 | 0.0109 | 0.0092 | 0.004) |
| 23 | 0.7954 | 0.6342 | 0.5067 | 0.4057 | 0.3256 | 0.2618 | 0.2109 | 0.1703 | 0.9378 | 0.1117 | 0.090 |  |  |  | 0.0462 | 0.03882 | 0.0181 | 0.0088 | 0.0074 | 0.0031 |
| 24. | 0.7876 | 0.6217 | 0.4919 | 0.3901 | 0.3101 | 0.2470 | 0.1974 | 0.1577 | 0.1264 | 0.1015 | 0.0817 |  |  | 0.0492 | 0.0402 | 0.6329 | 0.0151 | 0.0071 | 0.0069 | 0.0024 |
| 25 | 0.7798 | 0.6095 | 0.4776 | 0.3751 | 0.2953 | 0.2330 | 0.1842 | 0,4460 | 0.1160 | 0.0923 | 0.0738 | 0.0588 | 0.0532 | 0.0431 | 0348 | 0.0284 | 0.0126 | 0.0057 | 0.00447 | 0.0018 |
|  |  |  |  |  |  |  |  |  |  |  |  |  | 0.0471 | 0.0378 | 0.0304 | 0.024 | 0.0105 | 0.0045 | c.0038 | 0.0014 |
| $\frac{30}{35}$ | 0.7419 | 0.5521 | 0.4120 | 0.3083 | 0.2314 | 0.1741 | 0.1344 | 0.0994 | 0.0754 | 0.0573 | 0.0437 |  |  |  |  |  |  |  |  |  |
| 35 <br> 36 | 0.7059 | 0.5000 | 0.3554 | 0.2534 | 0.1813 | 0.1301 | 0.0937 | 0.0676 | 0.0490 | 0.0356 | 0.0259 |  |  |  | 0.0151 | 0.0116 | 0.10942 | 0.0016 | 80.0012 | * |
| 36 | 0.6989 | 0.4902 | 0.3450 | 0.2437 | 0.1727 | 0.1227 | 0.0875 | 0.0626 | 0.0449 | 0.0323 | 0.0234 | 0.0189 | 0.0139 |  | 0.0075 | 0.0055 | 0.0817 | 0.0005 | * | * |
| 40 | 0.6717 | 0.4529 | 0.3066 | 0.2083 | 0.1420 | 0.0972 | 0.0668 | 0.0460 | 0.0318 | 0.03 |  |  |  |  | 0.0065 | 0.0048 | 0.0014 | * | * | * |
| 50 | 0.6080 | 0.3715 | 0.2281 | 0.1407 | 0.0872 | 0.0543 | 0.0339 | 0.0213 | 0.0134 | 0.0085 | 0.0054 |  | . 007 | 0.0053 | 0.0037 | 0.0026 | 0.0007 | " | + | * |
|  |  |  |  |  |  |  |  |  |  |  |  |  | -102a | 0.0014 | 0.0009 | 0.0008 | * | , | * | - |

Table A-4 Present Value interest Factors for a One-Dollar Annuity Discounted at $k$ Percent for $n$ Periods: PVIFA $=\left[1-1 /(1+k)^{n}\right] / h$

| Petiod | 1\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | $8 \%$ | 9\% | 0\% | 11\% |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 0.9901 | 0.9304 | 0.9709 | 0.9615 | 0.9524 | 0.9434 | 0.9346 | 0.9259 | 0.9174 | 0.9099 | 0.9009 | ${ }_{0}^{12 \%}$ | 0.8850 | $\frac{185 \%}{0.8772}$ | -15\% | 16\% | 20\% | 24\% | 2\% | 30\% |
| 2 | 1.9704 | 1.9416 | 1.9135 | 1.8861 | 1.8594 | 1.8334 | 1.8080 | 1.7833 | 1.7594 |  | 1.7125 | 1.880\% | -0.8880 | 0.8772 | 0.8696 | 0.8621 | 0.8333 | 2.3065 | 0.8003 | 0.7892 |
| 3 | 29440 | 2.8839 | 2.8285 | 2.7759 | 2.7232 | 2.5730 | 2.6243 | 2.5779 | 2.5313 | $\frac{1.7355}{2.4869}$ | $\frac{1.7125}{2.4437}$ | $\frac{1.6809}{2.4018}$ | $\frac{1.6881}{73612}$ | 8.6467 | 1.6257 | 1.6052 | 1.5278 | 1.4568 | 1.4400 | 1.3109 |
| 4 | 3.9020 | 3.8077 | 3.7171 | 3.6299 | 3.5460 | 3.4651 | 3.3872 | 3.3121 | 3.2397 | 2.8869 <br> .1699 | 2.44 | 2.4018 | 3612 | 2.3216 | 2.2832 | 2.2459 | 2.1065 | 1.8893 | 1.9520 | 1.8169 |
| 5 | 4.8534 | 4.7135 | 4.5797 | 4.4518 | 4.3295 | 4.2124 | \$. 5002 | 3.9927 | 3.8897 | 3.7908 | $\frac{3.1024}{}$ | 0373 | 2.9745 | 2.8137 | 2.8550 | 2.7982 | 2.5887 | 2.4043 | 2.3616 | 2.8662 |
|  |  |  |  |  |  |  | 4.,4002 | 3.9927 | 3.8897 | 3.7908 | 9 | 3.5048 | 3.5472 | 3.4331 | 3.3522 | 3.2743 | 2.9106 | 2.7454 | 2.6883 | . 4356 |
| 6 | 5.7955 | 5.6014 | 5.4172 | 5.2421 | 5.0757 | 4.9173 | 4.7665 | 4.62\% | 4.4859 | 4.3553 |  |  |  |  |  |  |  |  |  |  |
| 7 | 6.7282 | 6.4720 | 6.2303 | 6.0021 | 5.7864 | 5.5824 | 5.3893 | 5.2064 | 5.48330 | 4.85684 | 4.2305 | 4.1114 | 3.9975 | 3.8887 | 3.784 .5 | 3.6887 | 3.3255 | 3.0205 | 2.9514 | 2.6427 |
| 8 | 7.6517 | 7.3255 | 7.0197 | 6.7327 | 6.4632 | 6.2098 | 5.9713 | 5.7456 | 5.534 a | 5.334 | $\frac{4.7122}{}$ | 4.56 .33 | 源 | 3 | 4.1604 | 4.0388 | 3.6046 | 3.2423 | 3.1611 | 2.6024 |
| 9 | 8.5660 | 8.1622 | 7.7861 | 7.4353 | 7.1078 | 6.8017 | 6.5452 | 6.2469 | 5.995 | 5.75 | 5.1467 | 4.9676 | 4.7988 | 4.6389 | 4.4873 | 3438 | 3372 | 3.4212 | 3.3289 | 2.3247 |
| 10 | 9.4713 | 8.9826 | 8.5302 | 8.1109 | 7.7217 | 7.3609 | 7.02 | 6.7101 |  |  |  | 502 |  | 9464 | 4.7716 | 606 | 4.0310 | 3.5655 | 3.4831 | 3.0190 |
|  |  |  |  |  |  | 7.30 | 1.02 | 6.7 | 5.417 | 6.148 | 5.8892 | 5.6502 | 6.42 | 2161 | 5.0188 | 4.8332 | 4. 1925 | 3.6813 | 3.5705 | 3.19915 |
| 11 | 10.368 | 9.7868 | 9.2526 | 8.7605 | 6.3064 | 7.8869 | 7.4987 | 7.1390 | 6.8052 | 4951 |  |  |  |  |  |  |  |  |  |  |
| 12 | 11.255 | 10.575 | 9.9540 | 9.3851 | 8.8633 | 8.3838 | 7.9427 | 7.5364 | 7.1507 | ${ }_{6}^{6.8137}$ | 6.2 |  |  |  | 5.2337 | 5.0286 | 4.3274 | 3.775\% | . 65 | 3.1173 |
| 13 | 12.134 | 11.348 | 10.635 | 9.9856 | 9.3936 | 8.8527 | 8.3577 | 7.9038 | 7.886 |  |  |  |  |  | 5.5206 | . 1971 | 4.392 | 3.8514 | 3.7254 | 3.9903 |
| 14 | 13.004 | 12.106 | 11.296 | 10.553 | 9.5986 | 8.2950 | 8.7655 | 8.2442 | 7.8869 7.7862 | 7.1038 | $\frac{6.7499}{6.9818}$ | 4235 | 6.1218 | 5.8424 | 5.5831 | 5.3423 | 4.5327 | 3.9124 | 8.78 .9 | 3.2933 |
| 15 | 13.865 | 12.848 | 11.938 | 11,918 | 10.380 | 9.7122 | 9.1079 | 8.5595 | 3.0607 | 7.65061 |  |  | 6.3025 | 6.0021 | 3.7245 | 4875 | 4.8178 | 3.9616 | 3.8241 | 3.2887 |
|  |  |  |  |  |  |  | 3.1079 | 8.5595 | 8.0507 | 7.6061 | 7.1909 | 6.8109 | 6.4624 | 6.1422 | 5.8479 | 5.5755 | 4.6755 | 4.0313 | 3.5593 | 3.2682 |
| 16 | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.108 | 9.4466 | 8.8514 | 8.3126 | 7.3237 | 7.37 |  |  |  |  |  |  |  |  |  |
| 17 | 15.562 | 14.292 | 13.166 | 12.966 | 11.274 | 10.477 | 9.7632 | 9,1216 | 8.5436 | 8.0216 | 7.54 | \% | 6.6039 | 6.2651 | 5.9542 | 5.6585 | 4.7296 | 4.0333 | 3.8874 | 3.2832 |
| 18 | 16.398 | 14.992 | 13.754 | 12.669 | 11.650 | 10.828 | 10.059 | 9.3719 | 8.7536 | 8.2014 | 7.7016 |  | 29 | 8.3729 | 6.0472 | 74 | 4.7746 | 0589 | 3.909 | 3.2548 |
| 19 | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.6036 | 8.9501 | 8.3848 | 7.8016 | 7.24 .97 | 33 | 6.45674 | 6.1280 | 5.8178 | 4.8122 | 0798 | 3.9279 | 3.3037 |
| 20 | 18.046 | 16.351 | 14.877 | 13.550 | 12.462 | 11.470 | 10.594 | 9.8189 |  |  |  |  |  |  | 198 | 87 | . 843 | 4.0967 | 3.9424 | 3.3105 |
|  |  |  |  |  |  |  | 10.534 | 2.0161 | 9.12 .85 | 8.5136 |  | 7.4694 | 7.0248 | 6.6231 | 6.2593 | 5.9288 | 4.8698 | 4.1103 | 3.9539 | 23158 |
| 21 | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.2922 | 48 | 8.075 |  |  |  |  |  |  |  |  |  |
| 22 | 19.660 | 17.658 | 15.937 | 14.451 | 13.163 | 12.042 | 11.069 | 10.201 | 9,4,42 | 8.7715 | 8.1757 | 5446 | 7.169 |  |  |  | . 8313 | 4.1212 | 3.9634 | 3.3798 |
| 23 | 20.456 | 18.292 | 16.444 | 14.857 | 13.489 | 12.303 | 11.272 | 10.371 | 9.5802 | 8.8832 | 8.2564 | 7.7184 | 7.229 | 6.79 | 6.3587 |  | 4.9034 | 00 | . 3705 | 3230 |
| 24 | 21.243 | 18.914 | 16.936 | 15.247 | 13.799 | 12.550 | 11.469 | 10.529 | 9.7068 | 8.9847 | 8.34 .81 | 7.7843 | 7.2829 | 6.835 | 6.43 | 6.0726 | 245 | . 1371 | 976 | 3254 |
| 25 | 22.023 | 19.523 | 17.413 | 15.622 | 14.094 | 12.783 | 11.654 | 10.675 | 9.8226 | 9.0770 | 8.4247 | 7.8431 | 7.3300 | 6.872 | 0.664 | ds | 4.9476 | 4.1428 | 3.9819 | 3272 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 4.947 | , 1474 | 3.98 | 3285 |
| 30 | 25.808 | 22.396 | 19.600 | 17.282 | 15.372 | 13.785 | 12.408 | 31.258 | 10.274 | 9.42 e9 | 8.6938 | 8.0562 | 7.495 |  |  |  |  |  |  |  |
| 35 | 29.409 | 24.999 | 21.487 | 18.665 | 16.374 | 14.498 | 12.948 | 11.655 | 10.587 | 9.8442 | 8.8552 | 8.1755 |  |  |  |  |  |  | 99 | 3321 |
| 36 | 30.108 | 25.489 | 21.832 | 18.908 | 16.547 | 14.621 | 13.035 | 11.717 | 10.612 | 3.5765 | ${ }^{8.8785}$ | 8.1924 | 7.5056 | 7.0700 | 6.6168 | 0.2153 | 4.9995 | 4.1644 | 3.9884 | 3.3330 |
| 40 | 32.835 | 27.355 | 23.115 | 19.793 | 17.159 | 15.046 | 13.332 | 11.925 | 10.757 | 9.7794 | 8.9511 | 8.8 .2438 | 7.3979 |  | 6.6231 | 220 | . 992 | 1684 | 3.9987 | 3.3331 |
| 50 | 39.196 | 31.424 | 25.730 | 21.482 | 18.256 | 15.762 | 13.801 | 12.233 | 10.962 | 9.9748 | 9.0417 | 8.3045 | 7.80 | 71327 | 648 | 23.35 | 9966 | 4.1659 | 3.9995 | 3.2332 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | 7.132 | 0.6605 | 6.24.83 | 4.9995 | 4.1666 | 3.9899 | $8.333:$ |

Table A-1 Future Value Interest Factors for One Dollar Compounded at $k$ Percent for $n$ Periods: $F V I F_{k, n}=(1+k)^{n}$

| Period | 9\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | 8\% | 9\% |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 1.0100 | 1.0200 | 1.0300 | 1.0400 | 1.0500 | 1.0600 | 1.0700 | 1.0800 | 1.0990 | 1.1000 | $\frac{11 \%}{1.1100}$ | 12\% | 73\% | 14\% | 15\% | 16\% | 20\% | 24\% |  |
| 2 | 1.0201 | 1.0404 | 1.0609 | 1.0816 | 1.1025 | 1.1236 | 1.1449 | 1.1664 | 1.98881 | 1.12100 | $\frac{1.1100}{1.2321}$ | 1.1200 | 1.1300 | 1.1400 | 1.1500 | 1.1600 | 1.3000 | 1.2400 |  |
| 3 | 1.0303 | 1.0612 | 1.0927 | 1.1249 | 1.1576 | 1.1910 | 1.2250 | 1.2597 | 1.1881 | 1.2100 | 1.2321 | 4 | 1.2769 | 1.2996 | 1.3225 | 1.3456 | 1.4400 | 1.5376 |  |
| 4 | 1.0406 | 1.0824 | 1.1255 | 1.1699 | 1.2155 | 1.2825 | 1.3108 | 1.3605 | 1.2960 | 1.3390 | 1.3676 | 1.4049 | 1.4429 | 1.4815 | 1.5209 | 1.5609 | 1.7280 | 1.9066 |  |
| 5 | 1.0510 | 1.1041 | 1.1593 | 1.2167 | 1.2763 | 1.3382 | 1.4026 | 1.4693 | 1.5388 | 1.4641 | 1.5181 | 1.5735 | 1.6305 | 1.6880 | 1.7490 | 1.8108 | 2.0736 | 2.3642 |  |
|  |  |  |  |  |  |  |  |  | 1.5366 | 1.6105 | 1.6851 | 1.7623 | 1.8424 | 1.9258 | 2.0114 | 2.1003 | 2.4883 | 2.9316 |  |
| 6 | 1.0645 | 1.1262 | 1.1941 | 1.2653 | 1.3401 | 1.4185 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | 1.0721 | 1.1487 | 1.2299 | 1.3159 | 1.4071 | 1.5036 | 1.6058 | 1.5869 | $\frac{1.6771}{1.8280}$ | $\frac{1.7716}{1.8487}$ | 1.8704 | 1.9738 | 2.0820 | 2.1950 | 2.3131 | 2.4364 | 2.8860 | 3.6352 |  |
| 8 | 1.0829 | 1.1717 | 1.2668 | 1.3686 | 1.4775 | 1.5938 | 1.7182 | 1.8509 | $\frac{1.8280}{1.9926}$ | 1.34.87 | 2.0762 | $2.210 \%$ | 2.3526 | 2.5023 | 2.6600 | 2.8262 | 3.5832 | 4.5077 | 4. |
| 9 | 1.0937 | 1.1951 | 1.3048 | 1.4233 | 1.5513 | 1.6895 | 1.8385 | 1.9990 | 2.1719 | 2.1436 | 2.3045 | 2.4780 | 2.8584 | 2.8526 | 3.0590 | 3.2784 | 4.2998 | 5.5895 |  |
| 10 | 1.1046 | 1.2990 | 1.3439 | -1.4802 | 1.6289 | 1.7908 | 1.9672 | 2.1589 | 2.3674 | 2.3579 | 2.5580 | 2.7731 | 3.0040 | 3.2519 | 3.5179 | 3.8030 | 5.1598 | 6.9310 |  |
|  |  |  |  |  |  |  | 1.962 | 2.158 | 2.3574 | 2.5937 | 2.8394 | 3.1058 | 3.3946 | 3.7072 | 4.0456 | 4.4114 | 6.1917 | 8.5944 |  |
| 11 | 1.1157 | 1.2434 | 1.3842 | 1.5395 | 1.7103 | 1.8983 | 2.1049 | 2.3316 | 2.5804 |  |  |  |  |  |  |  |  |  |  |
| 12 | 1.1268 | 1.2682 | 4.4258 | 1.6010 | 1.7959 | 2.0122 | 2.2522 | 2.5482 | 2.8127 | 2.6531 | 3.1518 | 3.4786 | 3.8359 | 4.2262 | 4.6524 | 5.1173 | 7.4301 | 10.657 |  |
| 13 | 1.1381 | 1.2936 | 1.4685 | 1.6651 | 1.8856 | 2.1329 | 2.4098 | 2.7195 | 3.0658 | 3.1384 | 3.4985 | 3.8960 | 4.8345 | 4.8179 | 5.3503 | 5.9360 | 8.9161 | 13.215 | 1 |
| 14 | 1.1495 | 1.3195 | 1.5126 | 1.7317 | 1.9799 | 2.2609 | 2.5785 | 2.9372 | 3.06517 | 3.458275 | 3.8833 | 5 | . 89880 | . 4924 | 5.1528 | 6.8858 | 10.699 | 16.386 | 1 |
| 15 | 1.1610 | 1.3459 | 1.5580 | 1.8009 | 2.0789 | 2.3966 | 2.7590 | 3.1722 |  |  |  | 4.8871 | 534 | 2613 | 7.0757 | 7.9875 | 12.839 | 20.319 |  |
|  |  |  |  |  |  |  |  | 3.1722 | 3.68,25 | 4.1772 | 4.7846 | 5.4736 | 6. 2543 | 7.1379 | 8.1371 | 9.2655 | 15.407 | 25.196 |  |
| 16 | 1.1726 | 1.3728 | 1.6047 | 1.8730 | 2.1829 | 2.5404 | 2.9522 | 3.4259 |  |  |  |  |  |  |  |  |  |  |  |
| 17 | 1.1843 | 1.4002 | 1.8528 | 1.9479 | 2.2930 | 2.6928 | 3.1588 | 3.4259 | $\frac{3.9703}{4.3276}$ | $\frac{4.5950}{5.0545}$ | 5.3109 | 6.1304 | 7.0673 | 8.1372 | 9.3576 | 10.748 | 18.488 | 31.243 | 35 |
| 18 | 1.1961 | 1.4282 | 1.7024 | 2.0258 | 2.4066 | 2.8543 | 3.3799 | 3.93960 | 4.37171 | 5.0545 | 5.8951 | 6.8660 | 7.9884 | 9,2765 | 10.761 | 12.468 | 22.186 | 38.741 |  |
| 19 | 1.2081 | 1.4568 | 1.7535 | 2.1068 | 2.5270 | 3.0256 | 3.6165 | 4.3157 | 5.1417 | 5.5599 | 6.5435 | 7.6900 | 9.0243 | 10.575 | 12.375 | 14.463 | 26.623 | 48.039 |  |
| 20 | 1.2202 | 1.4859 | 1.8061 | 2.1919 | 2.5533 | 3.2074 | 3.8697 | 4.8610 |  |  | $\frac{7.2633}{8.0823}$ | 8.6128 | 10.197 | 12.056 | 14.232 | 16.777 | 31.948 | 59.568 |  |
|  |  |  |  |  |  |  | 3.8097 | 4.8010 | 5.6044 | 6.7275 | 8.08 尔 | 9.6483 | 11.523 | 13.743 | 16.367 | 19.461 | 38.338 | 73.864 |  |
| 21 | 1.2324 | 1.5157 | 1.8603 | 2.2788 | 27860 | 3.3996 | 4.1406 | 5.0338 |  |  |  |  |  |  |  |  |  |  |  |
| 22 | 1.2447 | 1.5460 | 1.9161 | 2.3699 | 2.9253 | 3.6035 | 4.4304 | 5.4365 | $\frac{6.0858}{}$ |  | 8.9492 | 10.804 | 13.021 | 15.568 | 18.822 | 22.574 | 46.005 | 91.592 | 10 |
| 23 | 1.2572 | 1.5789 | 1.9736 | 2.4647 | 3.0745 | 3.8197 | 4.7408 | 5.8715 | 7.2578 |  | 3.9336 | 12.100 | 14.714 | 17.861 | 21.645 | 26.186 | 55.206 | 113.574 | 13 |
| 24 | 1.2697 | 1.5084 | 2.0328 | 2.5633 | 3.2251 | 4.0489 | 6.0724 | 6.3412 | 7.9111 |  | 11.0 | 13.552 | 16.627 | 20.362 | 24.891 | 30.376 | 66.247 | 140.831 | 16 |
| 25 | 1.2824 | 1.6406 | 2.0938 | 2.6658 | 3.3864 | 4.2919 | 5.4274 | 8.8485 |  |  |  | 15. | 18.788 | 23.212 | 28.625 | 35.236 | 79.497 | 174.631 | 21 |
|  |  |  |  |  |  |  | 5.4274 | 8.8485 | 8.6239 | 10.835 | 13.585 | 17.000 | 21.234 | 26.462 | 32.919 | 40.874 | 95.396 | 216.642 | 2 |
| 30 | 1.3478 | 1.8114 | 2.4273 | 3.2434 | 4.3219 | 3.7435 | 7.6123 | 10.063 |  |  |  |  |  |  |  |  |  |  |  |
| 35 | 1.4166 | 1.9999 | 2.8139 | 3.9461 | 5.5160 | 7.6861 | 10.677 | 14.785 |  |  |  | 28.960 | 39.116 | 50.950 | 66.212 | 85.850 | 237.376 | 634.820 |  |
| 36 | 1.4308 | 2.0399 | 2.8983 | 4.1039 | 5.7918 | 8.1473 | 11.424 | 15.968 | 22.851 | $\frac{28.102}{30.913}$ | 38.575 | 52.800 | 72.069 | 98.100 | 133.176 | 180.314 | 590.668 | $\cdots$ |  |
| 40 | 1.4889 | 2.2080 | 3.2620 | 4.8010 | 7.0400 | 10.236 | 14.974 | 21.725 |  | 30.913 | 42.818 | 59.136 | '81.437 | 111.834 | 153.152 | 209.164 | 708.802 | * |  |
| 50 | 1.6446 | 2.6916 | 4.3839 | 7.1067 | 11.467 | 18.420 | 29.467 | 46.902 | 74.358 | 45.259. | 65.001 | 93.051 | 432.782 | 188.884 | 267.884 | 378.721 | * | * |  |
|  |  |  |  |  |  |  |  |  |  | 117.391 | 184.865 | 289.002 | 450.736 | 700.233 | * | * | * |  |  |

Table A-2 Future Vabue Interest Factors for a One-Dollar Annuity Compouned at $k$ Percent for $n$ Periods: $F V / F A_{k, n}=\left[(1+k)^{n}=1\right] / k$

| Period | 1\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | 8\% | 9\% |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 1.0000 | 1.0200 | 1.0300 | 1.0400 | 1.0500 | 1.0600 | 1.0700 |  |  |  |  | 12\% | 13\% | 14\% | 35\% | 16\% | 20\% | 24\% |  |
| 2 | 2.0100 | 2.0200 | 2.0300 | 2.0400 | 2.0500 | 2.0600 | $\underline{1.0700}$ | 1.0800 | 1.0900 | 1.3000 | 1.1100 | 1.1200 | 1.2300 | 1.1400 | ¢.1500 | 1.1600 | 1.2900 | 1.2400 | 1.25 |
| 3 | 3.0301 | 3.0604 | 3.0909 | 3.1216 | 3.1525 | 3.1836 | 3.0700 | 3.0800 | $\frac{2.0900}{3.2781}$ | 2. 3.3000 | 2.1200 | 2.1200 | 2.1300 | 2.1400 | 2.1500 | 2.1600 | 2.2000 | 2.2400 |  |
| 4 | 4.0604 | 4.1216 | 4.1836 | 4.2465 | 4.3101 | 4.3746 | 4.4399 | 4.5061 | 3.2781 | 3.3100 | 3.3424 | 3744 | 3.4069 | 3.4396 | 3.4725 | 3.5056 | 3.6400 | 3.7176 |  |
| 5 | 3.1010 | 5.2040 | 5.3091 | 5.4163 | 5.5256 | 5.6371 |  |  | 4.5731 | 4.5410 | 4.7097 | 4.7793 | 4.8493 | 4.9211 | 4.9934 | 5.0665 | 5.3680 | 5.8842 |  |
|  |  |  |  |  | 5.52 .5 | 5.6371 | 5.760 | 5.8666 | 5.9847 | 6.1051 | 6.2278 | 6.3528 | 6.4803 | 6.6101 | 8.7424 | 5.8771 | 7.4416 | . 0484 |  |
| 6 | 6.1520 | 6.3081 | 6.4684 | 6.6330 | 6.8019 | 6.9753 | 7.1533 | 7.3359 | 7.5233 |  |  |  |  |  |  |  |  |  |  |
| 7 | 7.2135 | 7.4343 | 7.6625 | 7.8983 | 8.1420 | 8.3938 | 8.6540 | 8.9228 | 9.52004 | 7.715 | 7.9129 | 8.1152 | 8.3227 | 8.5355 | 8.7537 | 8.9775 | 9.9299 | 10.980 |  |
| 8 | 8.2857 | 8.5830 | 8.8923 | 9,2142 | 9.5491 | 9.8975 | 10.260 | 10.637 | 11.028 | 48 | 9.7833 | 10.089 | 05 | 10.730 | 11.067 | 11.414 | 12.916 | 14.815 |  |
| 9 | 9.3685 | 9.7546 | 10.159 | 10.583 | 13.027 | 11.491 | 11.978 | 12.48 |  | 1.4 | 11.8 | 12.300 | 12.767 | 13.233 | 13.727 | 14.240 | 16.498 | 19.123 |  |
| 10 | 10.462 | 10.950 | 11.464 | 12.006 | 12.578 | 13.181 | 13.816 | 14.487 |  |  | . 1 | 14.7 | 15.416 | . 085 | . 78.8 | 17.518 | 20.798 | 24.712 |  |
|  |  |  |  |  |  | 13.181 | 13.016 | $\underline{4.487}$ | 15.193 | 15.937 | . 722 | 47.549 | 18.420 | 19.337 | 20.304 | 21,321 | 25.959 | 31.643 |  |
| 11 | 11.567 | 12.169 | 12.808 | 13.488 | 14.207 | 14.972 | 45.784 | 16.645 |  |  |  |  |  |  |  |  |  |  |  |
| 12 | 12.683 | 13.412 | 14.192 | 15.026 | 15.917 | 16.870 | 17.888 |  |  |  |  | 20.655 | 21.894 | 23.04 | 24.349 | 25.733 | 32.150 | 40.238 |  |
| 13 | 13.809 | 14.680 | 15.618 | 16.627 | 17.713 | 18.882 | 20.141 |  | 20.141 | 21.384 | 22.713 | 24.133 | 25.650 | 27.271 | 29.002 | 30.850 | 39.584 | 50.895 |  |
| 14 | 14.947 | 15.974 | 17.085 | 18.292 | 19.599 | 21.015 | 22.550 | 24.215 | 26.019 |  | 26.412 | 28.029 | 29,985 | 32.089 | 34.352 | 36.786 | 48,497 | 64.110 |  |
| 15 | 16.097 | 17.293 | 18.599 | 20.024 | 21.579 | 23.276 | 25.129 |  |  | 27.975 | 30.095 | 32.383 | 38.883 | 37.581 | 40.505 | 43.672 | 59.196 | 80.496 |  |
|  |  |  |  |  |  | 2 S .27 | 25.128 | $\underline{27.152}$ | 29.361 | 31.772 | 34.405 | 37.2 | 40.417 | 43.842 | 47.580 | 51.660 | 72.035 | 100.815 |  |
| 16 | 17.258 | 18.639 | 20.157 | 21.825 | 23.657 | 5.673 | 27.888 | 30.3 |  |  |  |  |  |  |  |  |  |  |  |
| 17 | 18.430 | 20.012 | 21.762 | 23.698 | 25.340 | 28.213 | 30.840 | 33.750 | 33.003 | 35.950 | 39.180 | 42.763 | 46.672 | 50.980 | 55.717 | 50.925 | 87.442 | 126.011 |  |
| 18 | 19.615 | 21.412 | 23.414 | 25.645 | 28.132 | 30.906 | 33.999 | 37,450 | 36.37 | 40.545 | 44.501 | 48.884 | 53.739 | 59.118 | 65.075 | 74.673 | 105.931 | 157.253 |  |
| 19 | 20.811 | 22.841 | 25.117 | 27.671 | 30.539 | 33.760 | 37.379 | 41.446 | 45.018 | 45.5 | 50.396 | 55.750 | .725 | 8,394 | 75.836 | 84.141 | 128.117 | 195.994 |  |
| 20 | 22.019 | 24.297 | 26.870 | 29.778 | 33.066 | 36.786 | 40.995 | 45.762 |  |  | 36.939 | 3.4 | 70.749 | .969 | 8.212 | 98.803 | 154.740 | 244.033 |  |
|  |  |  |  |  |  |  |  | $45 . \% 62$ | 51.160 | 275 | 4.203 | . 252 | 30.847 | 91.025 | 102.444 | 115.380 | 186.688 | 303.601 |  |
| 21 | 23.239 | 25.783 | 28.676 | 31.989 | 35.719 | 39.993 | 44.865 | 50.423 |  |  |  |  |  |  |  |  |  |  |  |
| 22 | 24.472 | 27.299 | 30.537 | 34.248 | 38.505 | 43.392 | 49.006 | 55.457 | 62.873 | 64.002 |  | . 699 | 92.470 | 4.768 | 118.810 | 134.841 | 225.036 | 377.465 |  |
| 23 | 25.716 | 28.845 | 32.463 | 36.618 | 41.430 | 46.996 | 53.436 | 60.833 | 69.5 |  |  | 2.503 | 5.491 | 120.436 | 137.632 | 157.445 | 271.031 | 469.056 |  |
| 24 | 26.973 | 30.422 | 34.425 | 39.083 | 44.502 | 50.816 | 58.177 | 66.765 | 76.780 |  | 91.8 | 104.603 | 20.205 | 135.297 | 159.276 | 183.601 | 326.237 | 582.630 |  |
| 25 | 28.243 | 32.030 | 36.459 | 41.646 | 47.727 | 54.865 | 63.249 | 73.106 | 84.701 | 98.347 | 114.413 | 18.1335 | 36.834 | 158.659 | 184,158 | 213.978 | 392.484 | 723.481 | 843. |
|  |  |  |  |  |  |  |  |  |  | 98.347 | 114.483 | 133.334 | 155.620 | 181.871 | 212.793 | 249.214 | 471.931 | 898.092 |  |
| 30 | 34.785 | 40.568 | 47.575 | 56.085 | 66.439 | 79.058 | 94.469 | 113.283 | 136.308 |  |  |  |  |  |  |  |  |  |  |
| 35 | 41.660 | 49.994 | 60.462 | 73.652 | 90.320 | 111.435 | 138.237 | 113.28 | 136.308 | 164,494 | 189.021 | 241.333 | 293.199 | 356.787 | 434.745 | 530.312 | * | * |  |
| 36 | 43.077 | 51.984 | 63.276 | 77.598 | 95.836 | 119.121 | 148.913 | 187102 | 215.711 | 271.024 | 34.1890 | 431.663 | 546.681 | 693.573 | B81.170 | * | * | * |  |
| 40 | 48.886 | 60.402 | 75.401 | 95.026 | 420.800 | 154.762 | 199.635 | 259.057 | 236.125 | 293.127 | 380.164 | 484.463 | B18.749 | 791.673 | * | * | * | * |  |
| 50 | 64.463 | 84.579 | 112.797 | 152.667 | 209.348 | 290.336 | 406.529 | 573.770 | 815.08 | 442.59 | 581.826 | . 08 | * | $\stackrel{ }{*}$ |  | * | * | * |  |

