

UNIVERSITY OF SWAZILAND  
DEPARTMENT OF ACCOUNTING  
MAIN EXAMINATION PAPER 2005

DEGREE/DIPLOMA AND YEAR OF STUDY: B.COM V

TITLE OF PAPER : MANAGEMENT ACCOUNTING II

TIME ALLOWED : TWO (2) HOURS

INSTRUCTIONS :

1. TOTAL NUMBER OF QUESTIONS ON THIS PAPER: FOUR (4)
2. ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS
3. THE MARKS AWARDED FOR A QUESTION /PART ARE INDICATED AT THE END OF EACH QUESTION/PART OF QUESTION.
4. ALL CALCULATIONS ARE TO BE MADE TO THE NEAREST LILANGENL
5. WHERE APPLICABLE, SUBMIT ALL WORKINGS AND CALCULATIONS.

NOTE: YOU ARE REMINDED THAT IN ASSESSING YOUR WORK, ACCOUNT WILL BE TAKEN OF ACCURACY OF THE LANGUAGE AND THE GENERAL QUALITY OF EXPRESSION, TOGETHER WITH THE LAYOUT AND PRESENTATION OF YOUR FINAL ANSWER.

SPECIAL REQUIREMENTS: NONE

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

**QUESTION ONE**

(a) In the development of accounting data for decision-making purposes how can you briefly define the following terms:

(i) sunk cost (5 Marks)

(ii) relevant cost (5 Marks)

(iii) opportunity cost (5 Marks)

(b) Gogo Ltd has been producing two components, B12 and B18, for use in production. Following is data relating to B12 and B18.

|                         | <b>B12</b>    | <b>B18</b>    |
|-------------------------|---------------|---------------|
| Machine hours per unit  | <u>2.5</u>    | <u>3.0</u>    |
| Standard Cost per unit: |               |               |
| Direct material         | E2.25         | E3.75         |
| Direct labour           | 4.00          | 4.50          |
| Manufacturing Overhead: |               |               |
| Variable                | 2.00          | 2.25          |
| Fixed                   | <u>3.75</u>   | <u>4.50</u>   |
|                         | <u>E12.00</u> | <u>E15.00</u> |

- Notes: 1. Variable manufacturing overhead is applied on the basis of direct Labour hours.
2. Fixed manufacturing overhead is applied on the basis of machine hours.

Gogo's annual requirement for these components is 8000 units of B12 and 11, 000 units of B18. Recently, Gogo's management decided to devote additional machine time to other product lines resulting in only 41 000 machine hours per year that can be dedicated to the production of the components. An outside company has offered to sell Gogo the annual supply of the components at prices of E1 1.25 for B12 and E13.50 for B18.

Gogo wants to schedule the otherwise idle 41 000 machine hours to produce components so that the company can minimise its costs (Maximise benefits).

**Required:**

- (i) What would be the benefit (loss) per machine hour per component that would result if Gogo accepts to buy the components. (4 Marks)
- (ii) Which components should Gogo buy? Why? (4 Marks)
- (iii) What would be the composition (mix) of the components that Gogo should make itself and buy from the supplier to maximise profit (benefit) (4 Marks)
- iv) Without prejudice to your answer above, assume that Gogo's idle capacity of 41, 000 machine hours has a traceable avoidable annual fixed cost of E44000 that will continue if the capacity is not used. What is the maximum price would Gogo be willing to pay to a supplier for component B12? (5 Marks)
- (C) Amen Ltd normally produces and sells 20, 000 units of product X each year at total costs as follows:

|             |           |
|-------------|-----------|
| Fixed costs | E690, 000 |
| Variable    | E880,000  |

A proposal for a one-time-only special order is received from Nhlanguano based company. It is for 3000 units at a selling price of E55 per unit. Management of Amen Ltd has determined that sufficient idle capacity exists for making these units and their sale would not affect regular sales.

**Required:**

- (i) Compute the full (total) cost per unit of total production of 23, 000 units, if the special order were accepted. (4 Marks)
- (ii) Should the special order be accepted by Amen Ltd? Why? (4 Marks)

(Total : 40 Marks)

**QUESTION TWO**

- A. Jojo Ltd a manufacturing firm in Matsapha is considering the purchase of a small computer in order to reduce the cost of its data-processing operations. At the present time, the manual bookkeeping system in use involves the following direct cash expenses per month:

|                                 |              |
|---------------------------------|--------------|
| Salaries                        | E7 500       |
| Payroll taxes & fringe benefits | 1 700        |
| Forms and supplies              | <u>600</u>   |
|                                 | <u>E9800</u> |

Existing furniture and equipment are fully depreciated in the accounts and have no salvage value. The cost of the computer, including alterations, installation, and accessory equipment, is E1 00,000. The entire amount is depreciable for income-tax purposes on a reducing (declining) balance method at the rate of 20 percent per annum.

Estimated annual costs of computerized data processing are as follows:

|                                   |                |
|-----------------------------------|----------------|
| Supervisory salaries              | E1 5 000       |
| Other salaries                    | 24 000         |
| Payroll taxes and fringe benefits | 7 400          |
| Forms and supplies                | <u>7 200</u>   |
|                                   | <u>E53 600</u> |

The computer is expected to be obsolete in three years, at which time its salvage value is expected to be E20, 000. The company follows the practice of treating salvage as inflow at the time that it is likely to be received.

**Required:**

- (I) Compute the savings in annual cash expenses after taxes. Assume a 50 per cent tax rate. (10 Marks)
- (ii) Decide whether or not to purchase the computer, using the net present value (NPV) method. Assume a minimum rate of return of 10 percent after taxes. (9 Marks)
- B. What are the advantages and disadvantages of the following capital budgeting techniques?
- i) payback period (4 Marks)
- ii) net present value (NPV) (4 Marks)
- iii) Accounting (Simple) rate of return (3 Marks)
- (Total:30 Marks)

**QUESTION THREE**

A. Magele Hotel has given you the following paired activities:

0-1, 1-2, 2-4, 3-6, 1-5, 5-6, 2-3, 3-4 (dummy activity) 4,6.

**Required:** Construct the PERT network (10 Marks)

B. With reference to (A) above, the following time estimates, optimistic estimate a, most likely estimate m, and pessimistic estimate b, have been obtained for one of Magele's project activities:

| Activity | Time estimates in days |     |     |
|----------|------------------------|-----|-----|
|          | a                      | m   | b   |
| 0-1      | 3                      | 8   | 13  |
| 1-2      | 2                      | 5   | 14  |
| 2-4      | 11                     | 15  | 25  |
| 3-6      | 4                      | 10  | 22  |
| 1-5      | 0.5                    | 2   | 9.5 |
| 5-6      | 4                      | 5   | 6   |
| 2-3      | 1                      | 3.5 | 9   |
| 3-4      | 0                      | 0   | 0   |
| 4-6      | 4                      | 5   | 12  |

**Required** (i) using the equation  $E(t) = \frac{a + 4m + b}{6}$

**Required:**

- i) determine the expected completion times for all activities (5 marks)
- ii) determine the critical path, and the slack at each event in the network (5 Marks).
- iii) compute the total slack in the network (5 Marks)

C. Assuming there were large amounts of slack in the network developed in requirement A and B above, management has decided to utilise some of that slack in order to accelerate the project. Not all of the resources in the project are transferable, nor is all of the slack in the network idle capacity. Some of it is attributable waiting time, paint to dry for instance. However, the slack at event 3 does represent idle capacity, and some of the equipment and labour allocated to activity 3-6 can be shifted on a one-to-one basis to other activities. Accordingly 5 days' worth of resources are shifted from that activity to the critical activity 2-4, thereby increasing the time of activity 3-6 to 16 days, and reducing the time activity 2-4 to 11 days.

**Required:**

Determine the effect that the shift will have on the project's completion time.

(5 Marks)

(Total:30Marks)

**QUESTION FOUR**

A. Fill in the missing numbers/figures in the following three independent

| cases:               | <u>Dept 1</u> | <u>Dept 2</u> | <u>Dept 3</u> |         |
|----------------------|---------------|---------------|---------------|---------|
| Revenue              |               | a             | E450,000      | K       |
| Expenses             |               | E100,000      | f             | l       |
| Departments profit   |               | b             | g             | E20,000 |
| Average total assets |               | E300,000      | h             | m       |
| Asset turnover       |               | c             | 4             | 2.5     |
| Profit margin        |               | d             | 8%            | n       |
| Achieved ROI         |               | e             | i             | 12%     |
| Residual income      |               | E15,000       | E5,000        | 0       |
| Target ROI           |               | 12%           | j             | 14%     |

(15 Marks)

B. African Garments relies on a residual income measure to evaluate the performance of certain divisional managers. The target rate of return for all divisions is 12%. One division, Division A, generated divisional income of E800,000 for the year just ended. For the same period, Division A's residual income was E320,000.

**Required:** Compute

- i) the amount of average assets employed by Division A (7½ Marks)
  - ii) the ROI for Division A (7½ Marks)
- (Total: 30 Marks)

# A Mathematical Tables

Table A-1  
Present Value of \$1 Due at the End of n Periods:

$$PVIF_{k,n} = \frac{1}{(1+k)^n}$$

| Period | 1%    | 2%    | 3%    | 4%    | 5%    | 6%    | 7%    | 8%    | 9%    | 10%   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1      | .9901 | .9804 | .9709 | .9615 | .9524 | .9434 | .9346 | .9259 | .9174 | .9091 |
| 2      | .9803 | .9612 | .9426 | .9246 | .9070 | .8900 | .8734 | .8573 | .8417 | .8264 |
| 3      | .9706 | .9423 | .9151 | .8890 | .8638 | .8396 | .8163 | .7938 | .7722 | .7513 |
| 4      | .9610 | .9238 | .8885 | .8548 | .8227 | .7921 | .7629 | .7350 | .7084 | .6830 |
| 5      | .9515 | .9057 | .8626 | .8219 | .7835 | .7473 | .7130 | .6806 | .6499 | .6209 |
| 6      | .9420 | .8880 | .8375 | .7903 | .7462 | .7050 | .6663 | .6302 | .5963 | .5645 |
| 7      | .9327 | .8706 | .8131 | .7599 | .7107 | .6651 | .6227 | .5835 | .5470 | .5132 |
| 8      | .9235 | .8535 | .7894 | .7307 | .6768 | .6274 | .5820 | .5403 | .5019 | .4665 |
| 9      | .9143 | .8368 | .7664 | .7026 | .6446 | .5919 | .5439 | .5002 | .4604 | .4241 |
| 10     | .9053 | .8203 | .7441 | .6756 | .6139 | .5584 | .5083 | .4632 | .4224 | .3855 |
| 11     | .8963 | .8043 | .7224 | .6496 | .5847 | .5268 | .4751 | .4289 | .3875 | .3505 |
| 12     | .8874 | .7885 | .7014 | .6246 | .5568 | .4970 | .4440 | .3971 | .3555 | .3186 |
| 13     | .8787 | .7730 | .6810 | .6006 | .5303 | .4688 | .4150 | .3677 | .3262 | .2897 |
| 14     | .8700 | .7579 | .6611 | .5779 | .5051 | .4423 | .3878 | .3405 | .2992 | .2633 |
| 15     | .8613 | .7430 | .6419 | .5553 | .4810 | .4173 | .3624 | .3152 | .2745 | .2394 |
| 16     | .8528 | .7284 | .6232 | .5339 | .4581 | .3936 | .3387 | .2919 | .2519 | .2176 |
| 17     | .8444 | .7142 | .6050 | .5134 | .4363 | .3714 | .3166 | .2703 | .2311 | .1978 |
| 18     | .8360 | .7002 | .5874 | .4936 | .4155 | .3503 | .2957 | .2502 | .2120 | .1799 |
| 19     | .8277 | .6864 | .5703 | .4746 | .3957 | .3305 | .2765 | .2317 | .1945 | .1635 |
| 20     | .8195 | .6730 | .5537 | .4564 | .3769 | .3118 | .2584 | .2145 | .1784 | .1486 |
| 21     | .8114 | .6598 | .5375 | .4388 | .3589 | .2942 | .2415 | .1987 | .1637 | .1351 |
| 22     | .8034 | .6468 | .5219 | .4220 | .3418 | .2775 | .2257 | .1839 | .1502 | .1228 |
| 23     | .7954 | .6342 | .5067 | .4057 | .3256 | .2618 | .2109 | .1703 | .1378 | .1117 |
| 24     | .7876 | .6217 | .4919 | .3901 | .3101 | .2470 | .1971 | .1577 | .1264 | .1015 |
| 25     | .7798 | .6095 | .4776 | .3751 | .2953 | .2330 | .1842 | .1460 | .1160 | .0923 |
| 26     | .7720 | .5976 | .4637 | .3604 | .2812 | .2198 | .1722 | .1352 | .1064 | .0839 |
| 27     | .7644 | .5859 | .4502 | .3468 | .2678 | .2074 | .1609 | .1252 | .0976 | .0763 |
| 28     | .7568 | .5744 | .4371 | .3335 | .2551 | .1956 | .1504 | .1159 | .0885 | .0693 |
| 29     | .7493 | .5631 | .4243 | .3207 | .2429 | .1846 | .1406 | .1073 | .0822 | .0630 |
| 30     | .7419 | .5521 | .4120 | .3083 | .2314 | .1741 | .1314 | .0994 | .0754 | .0573 |
| 35     | .7059 | .5000 | .3554 | .2534 | .1813 | .1301 | .0937 | .0676 | .0490 | .0356 |
| 40     | .6717 | .4529 | .3066 | .2083 | .1420 | .0972 | .0668 | .0460 | .0318 | .0221 |
| 45     | .6391 | .4102 | .2644 | .1712 | .1113 | .0727 | .0476 | .0313 | .0207 | .0137 |
| 50     | .6080 | .3715 | .2281 | .1407 | .0872 | .0543 | .0339 | .0213 | .0134 | .0085 |
| 55     | .5785 | .3365 | .1968 | .1157 | .0683 | .0406 | .0242 | .0145 | .0087 | .0053 |

Table A-1  
(continued)

| Period | 12%   | 14%   | 15%   | 16%   | 18%   | 20%   | 24%   | 28%   | 32%   | 36%   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1      | .8929 | .8772 | .8696 | .8621 | .8475 | .8333 | .8065 | .7813 | .7576 | .7353 |
| 2      | .7917 | .7695 | .7561 | .7432 | .7182 | .6944 | .6504 | .6104 | .5739 | .5407 |
| 3      | .7118 | .6750 | .6575 | .6407 | .6086 | .5787 | .5245 | .4768 | .4348 | .3975 |
| 4      | .6355 | .5921 | .5718 | .5523 | .5158 | .4823 | .4230 | .3725 | .3294 | .2923 |
| 5      | .5674 | .5194 | .4972 | .4761 | .4371 | .4019 | .3411 | .2910 | .2495 | .2149 |
| 6      | .5066 | .4556 | .4323 | .4104 | .3704 | .3349 | .2751 | .2274 | .1890 | .1580 |
| 7      | .4523 | .3996 | .3759 | .3538 | .3139 | .2791 | .2218 | .1776 | .1432 | .1162 |
| 8      | .4039 | .3506 | .3269 | .3050 | .2660 | .2326 | .1789 | .1388 | .1085 | .0854 |
| 9      | .3606 | .3075 | .2843 | .2630 | .2255 | .1938 | .1443 | .1084 | .0822 | .0628 |
| 10     | .3220 | .2697 | .2472 | .2267 | .1911 | .1615 | .1164 | .0847 | .0623 | .0462 |
| 11     | .2875 | .2366 | .2149 | .1954 | .1619 | .1346 | .0938 | .0662 | .0472 | .0340 |
| 12     | .2567 | .2076 | .1869 | .1685 | .1372 | .1122 | .0757 | .0517 | .0357 | .0250 |
| 13     | .2292 | .1821 | .1625 | .1452 | .1163 | .0935 | .0610 | .0404 | .0271 | .0184 |
| 14     | .2046 | .1597 | .1413 | .1252 | .0985 | .0779 | .0492 | .0316 | .0205 | .0135 |
| 15     | .1827 | .1401 | .1229 | .1079 | .0835 | .0649 | .0397 | .0247 | .0155 | .0099 |
| 16     | .1631 | .1229 | .1069 | .0980 | .0708 | .0541 | .0320 | .0193 | .0118 | .0073 |
| 17     | .1456 | .1078 | .0929 | .0802 | .0600 | .0451 | .0258 | .0150 | .0089 | .0054 |
| 18     | .1300 | .0946 | .0808 | .0691 | .0508 | .0376 | .0208 | .0118 | .0068 | .0039 |
| 19     | .1161 | .0829 | .0703 | .0596 | .0431 | .0313 | .0168 | .0092 | .0051 | .0029 |
| 20     | .1037 | .0728 | .0611 | .0514 | .0365 | .0261 | .0135 | .0072 | .0039 | .0021 |
| 21     | .0926 | .0638 | .0531 | .0443 | .0309 | .0217 | .0109 | .0056 | .0029 | .0016 |
| 22     | .0826 | .0560 | .0462 | .0382 | .0262 | .0181 | .0088 | .0044 | .0022 | .0012 |
| 23     | .0738 | .0491 | .0402 | .0329 | .0222 | .0151 | .0071 | .0034 | .0017 | .0008 |
| 24     | .0659 | .0431 | .0349 | .0284 | .0188 | .0126 | .0057 | .0027 | .0013 | .0006 |
| 25     | .0588 | .0378 | .0304 | .0245 | .0160 | .0105 | .0046 | .0021 | .0010 | .0005 |
| 26     | .0525 | .0331 | .0264 | .0211 | .0135 | .0087 | .0037 | .0016 | .0007 | .0003 |
| 27     | .0469 | .0291 | .0230 | .0182 | .0115 | .0073 | .0030 | .0013 | .0006 | .0002 |
| 28     | .0419 | .0255 | .0200 | .0157 | .0097 | .0061 | .0024 | .0010 | .0004 | .0002 |
| 29     | .0374 | .0224 | .0174 | .0135 | .0082 | .0051 | .0020 | .0008 | .0003 | .0001 |
| 30     | .0334 | .0196 | .0151 | .0116 | .0070 | .0042 | .0016 | .0006 | .0002 | .0001 |
| 35     | .0189 | .0102 | .0075 | .0055 | .0030 | .0017 | .0005 | .0002 | .0001 | *     |
| 40     | .0107 | .0053 | .0037 | .0026 | .0013 | .0007 | .0002 | .0001 | *     | *     |
| 45     | .0061 | .0027 | .0019 | .0013 | .0006 | .0003 | *     | *     | *     | *     |
| 50     | .0035 | .0014 | .0009 | .0006 | .0003 | .0001 | *     | *     | *     | *     |
| 55     | .0020 | .0007 | .0005 | .0003 | .0001 | *     | *     | *     | *     | *     |

\*The factor is zero to four decimal places.

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**Table A-2**  
Present Value of an Annuity of \$1 per Period  
for n Periods:

$$PVFA_{k,n} = \sum_{t=1}^n \frac{1}{(1+k)^t} = \frac{1 - \frac{1}{(1+k)^n}}{k} = \frac{1}{k} - \frac{1}{k(1+k)^n}$$

| Number of Periods | PVFA <sub>k,n</sub> |         |         |         |         |         |         |         |         |
|-------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                   | 1%                  | 2%      | 3%      | 4%      | 5%      | 6%      | 7%      | 8%      | 9%      |
| 1                 | 0.9901              | 0.9804  | 0.9709  | 0.9615  | 0.9524  | 0.9434  | 0.9346  | 0.9259  | 0.9174  |
| 2                 | 1.9704              | 1.9416  | 1.9135  | 1.8861  | 1.8594  | 1.8334  | 1.8080  | 1.7833  | 1.7591  |
| 3                 | 2.9410              | 2.8839  | 2.8286  | 2.7751  | 2.7232  | 2.6730  | 2.6243  | 2.5771  | 2.5313  |
| 4                 | 3.9020              | 3.8077  | 3.7171  | 3.6299  | 3.5460  | 3.4651  | 3.3872  | 3.3121  | 3.2397  |
| 5                 | 4.8534              | 4.7135  | 4.5797  | 4.4518  | 4.3295  | 4.2124  | 4.1002  | 3.9927  | 3.8897  |
| 6                 | 5.7955              | 5.6014  | 5.4172  | 5.2421  | 5.0757  | 4.9173  | 4.7665  | 4.6229  | 4.4859  |
| 7                 | 6.7282              | 6.4720  | 6.2303  | 6.0021  | 5.7864  | 5.5824  | 5.3893  | 5.2064  | 5.0330  |
| 8                 | 7.6517              | 7.3255  | 7.0197  | 6.7327  | 6.4632  | 6.2098  | 5.9713  | 5.7466  | 5.5348  |
| 9                 | 8.5660              | 8.1622  | 7.7861  | 7.4353  | 7.1078  | 6.8017  | 6.5152  | 6.2469  | 5.9952  |
| 10                | 9.4713              | 8.9826  | 8.5302  | 8.1109  | 7.7217  | 7.3601  | 7.0236  | 6.7101  | 6.4177  |
| 11                | 10.3676             | 9.7868  | 9.2526  | 8.7605  | 8.3064  | 7.8869  | 7.4987  | 7.1390  | 6.8052  |
| 12                | 11.2551             | 10.5753 | 9.9540  | 9.3851  | 8.8633  | 8.3838  | 7.9427  | 7.5361  | 7.1607  |
| 13                | 12.1337             | 11.3484 | 10.6350 | 9.9856  | 9.3936  | 8.8527  | 8.3577  | 7.9038  | 7.4869  |
| 14                | 13.0037             | 12.1062 | 11.2961 | 10.5631 | 9.8986  | 9.2950  | 8.7455  | 8.2442  | 7.7862  |
| 15                | 13.8651             | 12.8493 | 11.9379 | 11.1184 | 10.3797 | 9.7122  | 9.1079  | 8.5595  | 8.0607  |
| 16                | 14.7179             | 13.5777 | 12.5611 | 11.6523 | 10.8378 | 10.1059 | 9.4466  | 8.8514  | 8.3126  |
| 17                | 15.5623             | 14.2919 | 13.1661 | 12.1657 | 11.2741 | 10.4773 | 9.7632  | 9.1216  | 8.5436  |
| 18                | 16.3983             | 14.9920 | 13.7535 | 12.6593 | 11.6896 | 10.8276 | 10.0591 | 9.3719  | 8.7556  |
| 19                | 17.2260             | 15.6785 | 14.3238 | 13.1339 | 12.0853 | 11.1581 | 10.3356 | 9.6036  | 8.9501  |
| 20                | 18.0456             | 16.3514 | 14.8775 | 13.5903 | 12.4622 | 11.4699 | 10.5940 | 9.8181  | 9.1285  |
| 21                | 18.8570             | 17.0112 | 15.4150 | 14.0292 | 12.8212 | 11.7641 | 10.8355 | 10.0168 | 9.2922  |
| 22                | 19.6604             | 17.6580 | 15.9369 | 14.4511 | 13.1630 | 12.0416 | 11.0612 | 10.2007 | 9.4424  |
| 23                | 20.4558             | 18.2922 | 16.4436 | 14.8568 | 13.4886 | 12.3034 | 11.2722 | 10.3711 | 9.5802  |
| 24                | 21.2434             | 18.9139 | 16.9355 | 15.2470 | 13.7986 | 12.5504 | 11.4693 | 10.5288 | 9.7066  |
| 25                | 22.0232             | 19.5235 | 17.4131 | 15.6221 | 14.0939 | 12.7834 | 11.6536 | 10.6748 | 9.8226  |
| 26                | 22.7952             | 20.1210 | 17.8768 | 15.9828 | 14.3752 | 13.0032 | 11.8258 | 10.8100 | 9.9290  |
| 27                | 23.5596             | 20.7069 | 18.3270 | 16.3296 | 14.6430 | 13.2105 | 11.9867 | 10.9352 | 10.0266 |
| 28                | 24.3164             | 21.2813 | 18.7641 | 16.6631 | 14.8981 | 13.4062 | 12.1371 | 11.0511 | 10.1161 |
| 29                | 25.0658             | 21.8444 | 19.1885 | 16.9837 | 15.1411 | 13.5907 | 12.2777 | 11.1584 | 10.1983 |
| 30                | 25.8077             | 22.3965 | 19.6004 | 17.2920 | 15.3725 | 13.7648 | 12.4090 | 11.2578 | 10.2737 |
| 35                | 29.4086             | 24.9986 | 21.4872 | 18.6646 | 16.3742 | 14.4982 | 12.9477 | 11.6546 | 10.5668 |
| 40                | 32.8347             | 27.3555 | 23.1148 | 19.7928 | 17.1591 | 15.0463 | 13.3317 | 11.9246 | 10.7574 |
| 45                | 36.0945             | 29.4902 | 24.5187 | 20.7200 | 17.7741 | 15.4558 | 13.6055 | 12.1084 | 10.8812 |
| 50                | 39.1961             | 31.4236 | 25.2798 | 21.4822 | 18.2559 | 15.7619 | 13.8007 | 12.2355 | 10.9617 |
| 55                | 42.1472             | 33.1748 | 26.2744 | 22.1086 | 18.6335 | 15.9905 | 13.9399 | 12.3186 | 11.0140 |

**Table A-2**  
(continued)

| Number of Periods | PVFA <sub>k,n</sub> |        |        |        |        |        |        |        |        |        |  |  |
|-------------------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|
|                   | 10%                 | 12%    | 14%    | 15%    | 16%    | 18%    | 20%    | 24%    | 28%    | 32%    |  |  |
| 1                 | 0.9091              | 0.8929 | 0.8772 | 0.8696 | 0.8621 | 0.8475 | 0.8333 | 0.8065 | 0.7813 | 0.7576 |  |  |
| 2                 | 1.7355              | 1.6901 | 1.6467 | 1.6257 | 1.6052 | 1.5666 | 1.5278 | 1.4568 | 1.3916 | 1.3315 |  |  |
| 3                 | 2.4869              | 2.4018 | 2.3216 | 2.2832 | 2.2459 | 2.1743 | 2.1065 | 1.9813 | 1.8684 | 1.7663 |  |  |
| 4                 | 3.1699              | 3.0373 | 2.9137 | 2.8550 | 2.7982 | 2.6901 | 2.5887 | 2.4043 | 2.2410 | 2.0957 |  |  |
| 5                 | 3.7908              | 3.6048 | 3.4331 | 3.3522 | 3.2743 | 3.1272 | 2.9906 | 2.7454 | 2.5320 | 2.3452 |  |  |
| 6                 | 4.3553              | 4.1114 | 3.8887 | 3.7845 | 3.6847 | 3.4976 | 3.3255 | 3.0205 | 2.7594 | 2.5342 |  |  |
| 7                 | 4.8684              | 4.5638 | 4.2883 | 4.1604 | 4.0386 | 3.8115 | 3.6046 | 3.2423 | 2.9370 | 2.6775 |  |  |
| 8                 | 5.3349              | 4.9676 | 4.6389 | 4.4873 | 4.3436 | 4.0776 | 3.8372 | 3.4212 | 3.0758 | 2.7860 |  |  |
| 9                 | 5.7590              | 5.3282 | 4.9464 | 4.7716 | 4.6065 | 4.3030 | 4.0310 | 3.5655 | 3.1842 | 2.8681 |  |  |
| 10                | 6.1446              | 5.6502 | 5.2161 | 5.0188 | 4.8332 | 4.4941 | 4.1925 | 3.6819 | 3.2689 | 2.9304 |  |  |
| 11                | 6.4951              | 5.9377 | 5.4527 | 5.2337 | 5.0286 | 4.6560 | 4.3271 | 3.7757 | 3.3351 | 2.9776 |  |  |
| 12                | 6.8137              | 6.1944 | 5.6603 | 5.4206 | 5.1971 | 4.7932 | 4.4392 | 3.8514 | 3.3868 | 3.0133 |  |  |
| 13                | 7.1034              | 6.4235 | 5.8424 | 5.5831 | 5.3423 | 4.9095 | 4.5327 | 3.9124 | 3.4272 | 3.0404 |  |  |
| 14                | 7.3667              | 6.6282 | 6.0021 | 5.7245 | 5.4675 | 5.0081 | 4.6106 | 3.9616 | 3.4587 | 3.0609 |  |  |
| 15                | 7.6061              | 6.8109 | 6.1422 | 5.8474 | 5.5755 | 5.0916 | 4.6755 | 4.0013 | 3.4834 | 3.0764 |  |  |
| 16                | 7.8237              | 6.9740 | 6.2651 | 5.9542 | 5.6685 | 5.1624 | 4.7296 | 4.0333 | 3.5026 | 3.0882 |  |  |
| 17                | 8.0216              | 7.1196 | 6.3729 | 6.0472 | 5.7487 | 5.2223 | 4.7746 | 4.0591 | 3.5177 | 3.0971 |  |  |
| 18                | 8.2014              | 7.2497 | 6.4674 | 6.1280 | 5.8178 | 5.2732 | 4.8122 | 4.0799 | 3.5294 | 3.1039 |  |  |
| 19                | 8.3649              | 7.3658 | 6.5504 | 6.1982 | 5.8775 | 5.3162 | 4.8435 | 4.0967 | 3.5386 | 3.1090 |  |  |
| 20                | 8.5136              | 7.4694 | 6.6231 | 6.2593 | 5.9288 | 5.3527 | 4.8696 | 4.1103 | 3.5458 | 3.1129 |  |  |
| 21                | 8.6487              | 7.5620 | 6.6870 | 6.3125 | 5.9731 | 5.3837 | 4.8913 | 4.1212 | 3.5514 | 3.1158 |  |  |
| 22                | 8.7715              | 7.6446 | 6.7429 | 6.3587 | 6.0113 | 5.4099 | 4.9094 | 4.1300 | 3.5558 | 3.1180 |  |  |
| 23                | 8.8832              | 7.7184 | 6.7921 | 6.3988 | 6.0442 | 5.4321 | 4.9245 | 4.1371 | 3.5592 | 3.1197 |  |  |
| 24                | 8.9847              | 7.7843 | 6.8351 | 6.4338 | 6.0726 | 5.4509 | 4.9371 | 4.1428 | 3.5619 | 3.1210 |  |  |
| 25                | 9.0770              | 7.8431 | 6.8729 | 6.4641 | 6.0971 | 5.4669 | 4.9476 | 4.1474 | 3.5640 | 3.1220 |  |  |
| 26                | 9.1609              | 7.8957 | 6.9061 | 6.4906 | 6.1182 | 5.4804 | 4.9563 | 4.1511 | 3.5656 | 3.1227 |  |  |
| 27                | 9.2372              | 7.9426 | 6.9352 | 6.5135 | 6.1364 | 5.4919 | 4.9636 | 4.1542 | 3.5669 | 3.1233 |  |  |
| 28                | 9.3066              | 7.9844 | 6.9607 | 6.5335 | 6.1520 | 5.5016 | 4.9697 | 4.1566 | 3.5679 | 3.1237 |  |  |
| 29                | 9.3696              | 8.0218 | 6.9830 | 6.5509 | 6.1656 | 5.5098 | 4.9747 | 4.1585 | 3.5687 | 3.1240 |  |  |
| 30                | 9.4269              | 8.0552 | 7.0027 | 6.5660 | 6.1772 | 5.5168 | 4.9789 | 4.1601 | 3.5693 | 3.1242 |  |  |
| 35                | 9.6442              | 8.1755 | 7.0700 | 6.6166 | 6.2153 | 5.5386 | 4.9915 | 4.1644 | 3.5708 | 3.1248 |  |  |
| 40                | 9.7791              | 8.2438 | 7.1050 | 6.6418 | 6.2335 | 5.5482 | 4.9966 | 4.1659 | 3.5712 | 3.1250 |  |  |
| 45                | 9.8628              | 8.2825 | 7.1232 | 6.6543 | 6.2421 | 5.5523 | 4.9986 | 4.1664 | 3.5714 | 3.1250 |  |  |
| 50                | 9.9148              | 8.3045 | 7.1327 | 6.6605 | 6.2463 | 5.5541 | 4.9995 | 4.1666 | 3.5714 | 3.1250 |  |  |
| 55                | 9.9471              | 8.3170 | 7.1376 | 6.6636 | 6.2482 | 5.5549 | 4.9998 | 4.1666 | 3.5714 | 3.1250 |  |  |