## UNIVERSITY OF BRADFORD

## BUSINESS ACCOUNTING (DISTANCE LEARNING)

## MAN4055M

Saturday $11^{\text {th }}$ January 2014
09:15-10:45 hours
Plus 10 minutes reading time

## Main

This is a CLOSED BOOK examination

Answer ALL multiple choice questions in Section A on the ANSWER GRID provided
(Answersheet and questions to be handed in with the answerbook)
All multiple choice questions carry equal marks

Answer any ONE question only from Section B All questions in Section B carry equal weighting

Discount tables are provided

## SECTION A - this section carries a 40\% weighting

## Answer ALL questions, using the answer grid supplied

All questions carry equal marks. There is only one correct answer to each question. There is no negative marking

## Question 1

Which of the following would NOT be included in current assets?

A Inventories
B Amounts receivable
C Bank overdraft
D Prepayments

## Question 2

Setting up an allowance or provision for future bad debts relating to sales already made, complies with:

A The realisation concept
B The prudence concept
C The going concern concept
D The consistency concept

## Question 3

Company A undertakes a rights issue of shares. Cash flow from operating activities in the cash flow statement will show:

A Increase equal to the new shares issued
B Decrease equal to the new shares issued
C Decrease equal to the dividend on shares including those newly issued
D No effect

## Question 4

Which of the following statements is true?
"We can build up our reserves on the balance sheet by.....
A putting a proportion of the money we receive from customers in a special bank account.
B not distributing as much of our profit by paying a lower dividend.
C spending money on a valuable painting and putting it in a bank vault.
D changing our policy to transfer all our spare money from Stock Exchange investments to bank deposits

## Question 5

Which of the following should be included in a calculation of the acid test or quick ratio?
A Work-in progress
B Raw materials and consumables
C Bank overdraft
D Non-current asset investments

## Question 6

If a company has a net margin of $10 \%$, a return on capital employed (ROCE) of $15 \%$ and a gearing of $25 \%$; what is its asset turnover?

A $\quad 4.00$ times
B $\quad 2.50$ times
C $\quad 1.67$ times
D $\quad 1.50$ times

## Question 7

A highly geared company...
A ...is likely to be very profitable
B ...reduces the cost of raising finance
C ...will tend to be sensitive to changes in demand and interest rates
D ...is not very sensitive to changes in demand and interest rate

## Question 8

A company buys goods for $£ 50$ and sells them for $£ 75$. Its mark-up is:
A $25.0 \%$
B $33.3 \%$
C $50.0 \%$
D $125.0 \%$

## Question 9

The future value in one year at $10 \%$ of $£ 1,000$ received now is:
A $£ 900$
B $£ 909$
C $£ 1,000$
D £1,100

Question 10
Which of the following statements is true?
A You should ensure that projects have "strategic fit" within your business before going ahead
B You should always accept a project if the net present value (NPV) is positive
C You should never accept a project if the NPV is negative
D You should only carry out sensitivity analysis if the NPV is negative

## Question 11

Marginal costing pays particular attention to the distinction between:
A Fixed costs and variable costs
B Allocated costs and apportioned costs
C Relevant costs and sunk costs
D Opportunity costs and replacement costs

## Question 12

For 10,000 units, the sales value is $£ 250,000$, the variable costs are $£ 150,000$ and the fixed costs are $£ 70,000$. The break-even point is a sales total of:
£000
A 150
B $\quad 175$
C 180
D 220

## Question 13

Break-even occurs when:
A Profit targets are achieved
B Contribution earned is exactly zero
C Fixed costs are covered by contribution
D Sales income equals fixed costs

## Question 14

Which of the following would NOT normally be considered a variable cost in a hairdressing salon?
A Cost of metered water and effluent
B Cost of shampoo, conditioners, styling lotions etc.
C Cost of laundry for towels and overalls
D Cost of advertising in local paper

## Question 15

Currently, the selling price of a product is $£ 20$ per unit, the variable cost per unit is $£ 16$, and the output per period is 50,000 units. Fixed costs per period are $£ 120,000$. The number of units which would have to be sold to make the same amount of profit with a $10 \%$ reduction in the selling price is:

|  | Units |
| :--- | ---: |
| A | 40,000 |
| B | 60,000 |
| C | 80,000 |
| D | 100,000 |

## Question 16

Which of the following statements is untrue?
A Absorption costing is useful in helping overall to set the right level of prices
B Absorption costing only takes into account the variable costs of production
C Absorption costing is not helpful in deciding whether to accept an order at special prices
D Absorption costing seeks to establish the total cost per unit of production

## Question 17

To make 2,000 units a business spends $£ 24,000$ on material and pays the operatives $£ 40,000$. Other costs of running the factory were $£ 50,000$. The sales force were paid $£ 18,000$ and other head office costs, including the chairman's salary were $£ 100,000$. The full or absorbed production cost per unit is:

A $£ 32$
B $£ 57$
C $£ 66$
D £116

## Question 18

Which of the following will not appear in the cash-flow forecast for the forthcoming period?
A Tax payable on last year's profits
B Insurance premiums to be paid in advance during the period
C Hire purchase instalments on equipment acquired last year
D Bad debts on last year's credit sales

## Question 19

An investment centre is a responsibility centre where the manager has control of:
A Costs, profits and assets
B Costs, profits and product quality
C Costs and profits only
D Costs only

## Question 20

Which of the following statements best describes a flexible budget?
A It changes on a daily basis
B It does not change during the budget period
C It is designed to change with the level of activity
D It is designed so that it does not have to change with the level of activity

## SECTION B <br> This section carries a 60\% weighting. Answer ONE question only

## Question 1

George is the Managing Director of the Sporting Company, a small specialist manufacturer of fleece jackets. In recent years the business has suffered a decline in sales, and profits for the year ended 30 April 2009 were $£ 15,200$. You are provided with the following information:

Sporting Company Limited - Trading Profit and Loss Account: Year ended 30 April 2009

| Sales Revenue | $\underline{\underline{E}}$ | $\underline{\underline{E}}$ | $20 \underline{\mathbf{E}}^{2}, 000$ |
| :---: | :---: | :---: | :---: |
| Cost of Goods Sold |  |  |  |
| Direct materials | 20,000 |  |  |
| Direct labour | 70,000 |  |  |
| Variable overheads | 10,000 |  |  |
| Fixed production overhead | 40,000 |  |  |
|  |  | 140,000 |  |
| Administration overhead |  | 20,000 |  |
| Selling and Distribution overheads |  |  |  |
| Sales commission | 10,000 |  |  |
| Delivery costs | 10,000 |  |  |
| Fixed costs | 4,800 |  |  |
|  |  | 24,800 |  |
|  |  |  | 184,800 |
| Profit |  |  | 15,200 |

Sales for 2008/09 were 10,000 jackets at a selling price of $£ 20$ each. Sales commission is payable at $5 \%$ of sales, and delivery costs vary in accordance with the number of jackets sold. Direct materials and direct labour are variable costs. George is considering two proposals aimed at improving profitability as follows:
i) Reduce the selling price of jackets by $10 \%$ which George anticipates will lead to a $40 \%$ increase in demand
ii) Enter into a contract with a mail order company to supply them with 2,500 jackets per year. The Sporting Company would be required to contribute $£ 6,000$ per year towards the cost of producing a mail order catalogue, and additional packaging costs of $£ 1$ per jacket would be payable by the Sporting Company. The mail order company would transport all the jackets from the Sporting Company to its own warehouse, and no sales commission would be payable by the Sporting Company. George anticipates that the existing sales of 10,000 per year would be unaffected if the mail order jackets contract is undertaken.

## Required

a) Calculate break-even sales at the 2008/09 level of activity
b) Provide George with a financial evaluation of proposal i).
c) Advise George what the minimum selling price should be under proposal ii) with the mail order company to ensure that the Sporting Company will break-even on the contract.
d) Briefly advise George of the limitations of break-even analysis.
(each part carries a $25 \%$ weighting)

## Question 2

Laser Software plc is a major distributor of computer software to small and medium-sized businesses. Although the business develops some software products itself, most are purchased from various software houses. The board of directors is currently considering the investment potential of three new tax accounting software products that have been developed by different software houses and offered for sale to the business.

The financial director of Laser Software plc has prepared the following financial estimates concerning the products:

|  | Initial Outlay | Cash Flows |  |  |
| :--- | :---: | :---: | :---: | :---: |
|  | Year 0 | Year 1 | Year 2 | Year 3 |
| Software Name | $£$ | $£$ | $£$ | $£$ |
| Taxmate | $(60,000)$ | 25,000 | 30,000 | 32,000 |
| Easy-tax | $(120,000)$ | 50,000 | 70,000 | 40,000 |
| Supertax | $(180,000)$ | 95,000 | 80,000 | 58,000 |

Laser Software uses a discount rate of $12 \%$ to assess its investment projects.

## Required

a) Calculate the following for each product:
i. The accounting rate of return based on initial outlay
ii. The payback period
iii. The net present value
(50\% weighting)
b) Assume the products are independent. Which product(s), if any, would you select and why?
(25\% weighting)
c) Assume the products are mutually exclusive. Which product(s), if any, would you select and why?
(25\% weighting)

## QUESTION 3

Stefana is starting up a new business on 1 January 20X1, and has provided you with the following information:

|  | $€$ |
| :---: | :---: |
| Quarterly rent of premises | 300 |
| first payment due on 25 March 20X1 |  |
| Cash outlay on equipment - payable 25 January60,000 |  |
| Monthly planned purchases of stock for resale |  |
| January | 30,000 |
| February | 20,000 |
| March to June (per month) | 16,000 |
| All stock is bought on one month's credit |  |
| Monthly planned sales are: |  |
| January | 10,000 |
| February | 16,000 |
| March to June (per month) | 26,000 |

1. Planned mark up on purchases is expected to be $33.33 \%$ on average.
2. All sales are on two month's credit. No bad debts or arrears of payments are expected.
3. Monthly cash outlay on general expenses is expected to be $€ 500$. Salaries are expected to be $€ 1,400$ per month to be paid on the last Thursday of each month.
4. Depreciation of equipment in the first half-year is estimated at $5 \%$ of initial cost.
5. Stefana will pay $€ 65,000$ cash into the business at the outset and does not plan to withdraw any money from the business during the year.
6. Any temporary financing is planned to be by way of an overdraft. Stefana has negotiated an overdraft limit of $€ 28,000$ with her bank manager.

## Required

a) Prepare a month-by-month cash flow forecast for the half-year to 30 June, 20X1, indicating the maximum overdraft required.
(30\% weighting)
b) Prepare a brief report for Stefana explaining your findings along with recommendations as to whether she should proceed with the venture, and making suggestions as to how she might improve her anticipated cash position. Rank your suggestions for actions starting with those over which you think Stefana will have most control.
(30\% weighting)
c) Using the original assumptions and the cash flow forecast you prepared in a) draw up a profit plan for the six months and a projected balance sheet at June 30. Prepare an explanation as to why the anticipated result differs from the net cash flow for the period.
(40\% weighting)

## ANNUITY TABLE

## Present value of $£ 1$ at the end of each year for $n$ years at a discount rate $r$

$\Sigma^{1-n} 1 /(1+r)^{n}$

```
n:1-25 years r:1%-30%
```

| Rate(r) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year ( $n$ ) | 1\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | 8\% | 9\% | 10\% | 11\% | 12\% | 13\% | 14\% | 15\% |
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 |
| 2 | 1.970 | 1.942 | 1.913 | 1.886 | 1.859 | 1.833 | 1.808 | 1.783 | 1.759 | 1.736 | 1.713 | 1.690 | 1.668 | 1.647 | 1.626 |
| 3 | 2.941 | 2.884 | 2.829 | 2.775 | 2.723 | 2.673 | 2.624 | 2.577 | 2.531 | 2.487 | 2.444 | 2.402 | 2.361 | 2.322 | 2.283 |
| 4 | 3.902 | 3.808 | 3.717 | 3.630 | 3.546 | 3.465 | 3.387 | 3.312 | 3.240 | 3.170 | 3.102 | 3.037 | 2.974 | 2.914 | 2.855 |
| 5 | 4.853 | 4.713 | 4.580 | 4.452 | 4.329 | 4.212 | 4.100 | 3.993 | 3.890 | 3.791 | 3.696 | 3.605 | 3.517 | 3.433 | 3.352 |
| 6 | 5.795 | 5.601 | 5.417 | 5.242 | 5.076 | 4.917 | 4.767 | 4.623 | 4.486 | 4.355 | 4.231 | 4.111 | 3.998 | 3.889 | 3.784 |
| 7 | 6.728 | 6.472 | 6.230 | 6.002 | 5.786 | 5.582 | 5.389 | 5.206 | 5.033 | 4.868 | 4.712 | 4.564 | 4.423 | 4.288 | 4.160 |
| 8 | 7.652 | 7.325 | 7.020 | 6.733 | 6.463 | 6.210 | 5.971 | 5.747 | 5.535 | 5.335 | 5.146 | 4.968 | 4.799 | 4.639 | 4.487 |
| 9 | 8.566 | 8.162 | 7.786 | 7.435 | 7.108 | 6.802 | 6.515 | 6.247 | 5.995 | 5.759 | 5.537 | 5.328 | 5.132 | 4.946 | 4.772 |
| 10 | 9.471 | 8.983 | 8.530 | 8.111 | 7.722 | 7.360 | 7.024 | 6.710 | 6.418 | 6.145 | 5.889 | 5.650 | 5.426 | 5.216 | 5.019 |
| 11 | 10.368 | 9.787 | 9.253 | 8.760 | 8.306 | 7.887 | 7.499 | 7.139 | 6.805 | 6.495 | 6.207 | 5.938 | 5.687 | 5.453 | 5.234 |
| 12 | 11.255 | 10.575 | 9.954 | 9.385 | 8.863 | 8.384 | 7.943 | 7.536 | 7.161 | 6.814 | 6.492 | 6.194 | 5.918 | 5.660 | 5.421 |
| 13 | 12.134 | 11.348 | 10.635 | 9.986 | 9.394 | 8.853 | 8.358 | 7.904 | 7.487 | 7.103 | 6.750 | 6.424 | 6.122 | 5.842 | 5.583 |
| 14 | 13.004 | 12.106 | 11.296 | 10.563 | 9.899 | 9.295 | 8.745 | 8.244 | 7.786 | 7.367 | 6.982 | 6.628 | 6.302 | 6.002 | 5.724 |
| 15 | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.712 | 9.108 | 8.559 | 8.061 | 7.606 | 7.191 | 6.811 | 6.462 | 6.142 | 5.847 |
| 16 | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.106 | 9.447 | 8.851 | 8.313 | 7.824 | 7.379 | 6.974 | 6.604 | 6.265 | 5.954 |
| 17 | 15.562 | 14.292 | 13.166 | 12.166 | 11.274 | 10.477 | 9.763 | 9.122 | 8.544 | 8.022 | 7.549 | 7.120 | 6.729 | 6.373 | 6.047 |
| 18 | 16.398 | 14.992 | 13.754 | 12.659 | 11.690 | 10.828 | 10.059 | 9.372 | 8.756 | 8.201 | 7.702 | 7.250 | 6.840 | 6.467 | 6.128 |
| 19 | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.604 | 8.950 | 8.365 | 7.839 | 7.366 | 6.938 | 6.550 | 6.198 |
| 20 | 18.046 | 16.351 | 14.877 | 13.590 | 12.462 | 11.470 | 10.594 | 9.818 | 9.129 | 8.514 | 7.963 | 7.469 | 7.025 | 6.623 | 6.259 |
| 21 | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.292 | 8.649 | 8.075 | 7.562 | 7.102 | 6.687 | 6.312 |
| 22 | 19.660 | 17.658 | 15.937 | 14.451 | 13.163 | 12.042 | 11.061 | 10.201 | 9.442 | 8.772 | 8.176 | 7.645 | 7.170 | 6.743 | 6.359 |
| 23 | 20.456 | 18.292 | 16.444 | 14.857 | 13.489 | 12.303 | 11.272 | 10.371 | 9.580 | 8.883 | 8.266 | 7.718 | 7.230 | 6.792 | 6.399 |
| 24 | 21.243 | 18.914 | 16.936 | 15.247 | 13.799 | 12.550 | 11.469 | 10.529 | 9.707 | 8.985 | 8.348 | 7.784 | 7.283 | 6.835 | 6.434 |
| 25 | 22.023 | 19.523 | 17.413 | 15.622 | 14.094 | 12.783 | 11.654 | 10.675 | 9.823 | 9.077 | 8.422 | 7.843 | 7.330 | 6.873 | 6.46 |


| Rate(r) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year ( $n$ ) | 16\% | 17\% | 18\% | 19\% | 20\% | 21\% | 22\% | 23\% | 24\% | 25\% | 26\% | 27\% | 28\% | 29\% | 30\% |
| 1 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 | 0.826 | 0.820 | 0.813 | 0.806 | 0.800 | 0.794 | 0.787 | 0.781 | 0.775 | 0.769 |
| 2 | 1.605 | 1.585 | 1.566 | 1.547 | 1.528 | 1.509 | 1.492 | 1.474 | 1.457 | 1.440 | 1.424 | 1.407 | 1.392 | 1.376 | 1.361 |
| 3 | 2.246 | 2.210 | 2.174 | 2.140 | 2.106 | 2.074 | 2.042 | 2.011 | 1.981 | 1.952 | 1.923 | 1.896 | 1.868 | 1.842 | 1.816 |
| 4 | 2.798 | 2.743 | 2.690 | 2.639 | 2.589 | 2.540 | 2.494 | 2.448 | 2.404 | 2.362 | 2.320 | 2.280 | 2.241 | 2.203 | 2.166 |
| 5 | 3.274 | 3.199 | 3.127 | 3.058 | 2.991 | 2.926 | 2.864 | 2.803 | 2.745 | 2.689 | 2.635 | 2.583 | 2.532 | 2.483 | 2.436 |
| 6 | 3.685 | 3.589 | 3.498 | 3.410 | 3.326 | 3.245 | 3.167 | 3.092 | 3.020 | 2.951 | 2.885 | 2.821 | 2.759 | 2.700 | 2.643 |
| 7 | 4.039 | 3.922 | 3.812 | 3.706 | 3.605 | 3.508 | 3.416 | 3.327 | 3.242 | 3.161 | 3.083 | 3.009 | 2.937 | 2.868 | 2.802 |
| 8 | 4.344 | 4.207 | 4.078 | 3.954 | 3.837 | 3.726 | 3.619 | 3.518 | 3.421 | 3.329 | 3.241 | 3.156 | 3.076 | 2.999 | 2.925 |
| 9 | 4.607 | 4.451 | 4.303 | 4.163 | 4.031 | 3.905 | 3.786 | 3.673 | 3.566 | 3.463 | 3.366 | 3.273 | 3.184 | 3.100 | 3.019 |
| 10 | 4.833 | 4.659 | 4.494 | 4.339 | 4.192 | 4.054 | 3.923 | 3.799 | 3.682 | 3.571 | 3.465 | 3.364 | 3.269 | 3.178 | 3.092 |
| 11 | 5.029 | 4.836 | 4.656 | 4.486 | 4.327 | 4.177 | 4.035 | 3.902 | 3.776 | 3.656 | 3.543 | 3.437 | 3.335 | 3.239 | 3.147 |
| 12 | 5.197 | 4.988 | 4.793 | 4.611 | 4.439 | 4.278 | 4.127 | 3.985 | 3.851 | 3.725 | 3.606 | 3.493 | 3.387 | 3.286 | 3.190 |
| 13 | 5.342 | 5.118 | 4.910 | 4.715 | 4.533 | 4.362 | 4.203 | 4.053 | 3.912 | 3.780 | 3.656 | 3.538 | 3.427 | 3.322 | 3.223 |
| 14 | 5.468 | 5.229 | 5.008 | 4.802 | 4.611 | 4.432 | 4.265 | 4.108 | 3.962 | 3.824 | 3.695 | 3.573 | 3.459 | 3.351 | 3.249 |
| 15 | 5.575 | 5.324 | 5.092 | 4.876 | 4.675 | 4.489 | 4.315 | 4.153 | 4.001 | 3.859 | 3.726 | 3.601 | 3.483 | 3.373 | 3.268 |
| 16 | 5.668 | 5.405 | 5.162 | 4.938 | 4.730 | 4.536 | 4.357 | 4.189 | 4.033 | 3.887 | 3.751 | 3.623 | 3.503 | 3.390 | 3.283 |
| 17 | 5.749 | 5.475 | 5.222 | 4.990 | 4.775 | 4.576 | 4.391 | 4.219 | 4.059 | 3.910 | 3.771 | 3.640 | 3.518 | 3.403 | 3.295 |
| 18 | 5.818 | 5.534 | 5.273 | 5.033 | 4.812 | 4.608 | 4.419 | 4.243 | 4.080 | 3.928 | 3.786 | 3.654 | 3.529 | 3.413 | 3.304 |
| 19 | 5.877 | 5.584 | 5.316 | 5.070 | 4.843 | 4.635 | 4.442 | 4.263 | 4.097 | 3.942 | 3.799 | 3.664 | 3.539 | 3.421 | 3.311 |
| 20 | 5.929 | 5.628 | 5.353 | 5.101 | 4.870 | 4.657 | 4.460 | 4.279 | 4.110 | 3.954 | 3.808 | 3.673 | 3.546 | 3.427 | 3.316 |
| 21 | 5.973 | 5.665 | 5.384 | 5.127 | 4.891 | 4.675 | 4.476 | 4.292 | 4.121 | 3.963 | 3.816 | 3.679 | 3.551 | 3.432 | 3.320 |
| 22 | 6.011 | 5.696 | 5.410 | 5.149 | 4.909 | 4.690 | 4.488 | 4.302 | 4.130 | 3.970 | 3.822 | 3.684 | 3.556 | 3.436 | 3.323 |
| 23 | 6.044 | 5.723 | 5.432 | 5.167 | 4.925 | 4.703 | 4.499 | 4.311 | 4.137 | 3.976 | 3.827 | 3.689 | 3.559 | 3.438 | 3.325 |
| 24 | 6.073 | 5.746 | 5.451 | 5.182 | 4.937 | 4.713 | 4.507 | 4.318 | 4.143 | 3.981 | 3.831 | 3.692 | 3.562 | 3.441 | 3.327 |
| 25 | 6.097 | 5.766 | 5.467 | 5.195 | 4.948 | 4.721 | 4.514 | 4.323 | 4.147 | 3.985 | 3.834 | 3.694 | 3.564 | 3.442 | 3.329 |

## PRESENT VALUE TABLE

Present value of $£ 1$ at the end of year $n$ at a discount rate $r \quad 1 /(1+r)^{n}$ $n: 1-25$ years $r: 1 \%-30 \%$

| Rate(r) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year ( $n$ ) | 1\% | 2\% | 3\% | 4\% | 5\% | 6\% | 7\% | 8\% | 9\% | 10\% | 11\% | 12\% | 13\% | 14\% | 15\% |
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 |
| 2 | 0.980 | 0.961 | 0.943 | 0.925 | 0.907 | 0.890 | 0.873 | 0.857 | 0.842 | 0.826 | 0.812 | 0.797 | 0.783 | 0.769 | 0.756 |
| 3 | 0.971 | 0.942 | 0.915 | 0.889 | 0.864 | 0.840 | 0.816 | 0.794 | 0.772 | 0.751 | 0.731 | 0.712 | 0.693 | 0.675 | 0.658 |
| 4 | 0.961 | 0.924 | 0.888 | 0.855 | 0.823 | 0.792 | 0.763 | 0.735 | 0.708 | 0.683 | 0.659 | 0.636 | 0.613 | 0.592 | 0.572 |
| 5 | 0.951 | 0.906 | 0.863 | 0.822 | 0.784 | 0.747 | 0.713 | 0.681 | 0.650 | 0.621 | 0.593 | 0.567 | 0.543 | 0.519 | 0.497 |
| 6 | 0.942 | 0.888 | 0.837 | 0.790 | 0.746 | 0.705 | 0.666 | 0.630 | 0.596 | 0.564 | 0.535 | 0.507 | 0.480 | 0.456 | 0.432 |
| 7 | 0.933 | 0.871 | 0.813 | 0.760 | 0.711 | 0.665 | 0.623 | 0.583 | 0.547 | 0.513 | 0.482 | 0.452 | 0.425 | 0.400 | 0.376 |
| 8 | 0.923 | 0.853 | 0.789 | 0.731 | 0.677 | 0.627 | 0.582 | 0.540 | 0.502 | 0.467 | 0.434 | 0.404 | 0.376 | 0.351 | 0.327 |
| 9 | 0.914 | 0.837 | 0.766 | 0.703 | 0.645 | 0.592 | 0.544 | 0.500 | 0.460 | 0.424 | 0.391 | 0.361 | 0.333 | 0.308 | 0.284 |
| 10 | 0.905 | 0.820 | 0.744 | 0.676 | 0.614 | 0.558 | 0.508 | 0.463 | 0.422 | 0.386 | 0.352 | 0.322 | 0.295 | 0.270 | 0.247 |
| 11 | 0.896 | 0.804 | 0.722 | 0.650 | 0.585 | 0.527 | 0.475 | 0.429 | 0.388 | 0.350 | 0.317 | 0.287 | 0.261 | 0.237 | 0.215 |
| 12 | 0.887 | 0.788 | 0.701 | 0.625 | 0.557 | 0.497 | 0.444 | 0.397 | 0.356 | 0.319 | 0.286 | 0.257 | 0.231 | 0.208 | 0.187 |
| 13 | 0.879 | 0.773 | 0.681 | 0.601 | 0.530 | 0.469 | 0.415 | 0.368 | 0.326 | 0.290 | 0.258 | 0.229 | 0.204 | 0.182 | 0.163 |
| 14 | 0.870 | 0.758 | 0.661 | 0.577 | 0.505 | 0.442 | 0.388 | 0.340 | 0.299 | 0.263 | 0.232 | 0.205 | 0.181 | 0.160 | 0.141 |
| 15 | 0.861 | 0.743 | 0.642 | 0.555 | 0.481 | 0.417 | 0.362 | 0.315 | 0.275 | 0.239 | 0.209 | 0.183 | 0.160 | 0.140 | 0.123 |
| 16 | 0.853 | 0.728 | 0.623 | 0.534 | 0.458 | 0.394 | 0.339 | 0.292 | 0.252 | 0.218 | 0.188 | 0.163 | 0.141 | 0.123 | 0.107 |
| 17 | 0.844 | 0.714 | 0.605 | 0.513 | 0.436 | 0.371 | 0.317 | 0.270 | 0.231 | 0.198 | 0.170 | 0.146 | 0.125 | 0.108 | 0.093 |
| 18 | 0.836 | 0.700 | 0.587 | 0.494 | 0.416 | 0.350 | 0.296 | 0.250 | 0.212 | 0.180 | 0.153 | 0.130 | 0.111 | 0.095 | 0.081 |
| 19 | 0.828 | 0.686 | 0.570 | 0.475 | 0.396 | 0.331 | 0.277 | 0.232 | 0.194 | 0.164 | 0.138 | 0.116 | 0.098 | 0.083 | 0.070 |
| 20 | 0.820 | 0.673 | 0.554 | 0.456 | 0.377 | 0.312 | 0.258 | 0.215 | 0.178 | 0.149 | 0.124 | 0.104 | 0.087 | 0.073 | 0.061 |
| 21 | 0.811 | 0.660 | 0.538 | 0.439 | 0.359 | 0.294 | 0.242 | 0.199 | 0.164 | 0.135 | 0.112 | 0.093 | 0.077 | 0.064 | 0.053 |
| 22 | 0.803 | 0.647 | 0.522 | 0.422 | 0.342 | 0.278 | 0.226 | 0.184 | 0.150 | 0.123 | 0.101 | 0.083 | 0.068 | 0.056 | 0.046 |
| 23 | 0.795 | 0.634 | 0.507 | 0.406 | 0.326 | 0.262 | 0.211 | 0.170 | 0.138 | 0.112 | 0.091 | 0.074 | 0.060 | 0.049 | 0.040 |
| 24 | 0.788 | 0.622 | 0.492 | 0.390 | 0.310 | 0.247 | 0.197 | 0.158 | 0.126 | 0.102 | 0.082 | 0.066 | 0.053 | 0.043 | 0.035 |
| 25 | 0.780 | 0.610 | 0.478 | 0.375 | 0.295 | 0.233 | 0.184 | 0.146 | 0.116 | 0.092 | 0.074 | 0.059 | 0.047 | 0.038 | 0.030 |


| Rate(r) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year ( $n$ ) | 16\% | 17\% | 18\% | 19\% | 20\% | 21\% | 22\% | 23\% | 24\% | 25\% | 26\% | 27\% | 28\% | 29\% | 30\% |
| 1 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 | 0.826 | 0.820 | 0.813 | 0.806 | 0.800 | 0.794 | 0.787 | 0.781 | 0.775 | 0.769 |
| 2 | 0.743 | 0.731 | 0.718 | 0.706 | 0.694 | 0.683 | 0.672 | 0.661 | 0.650 | 0.640 | 0.630 | 0.620 | 0.610 | 0.601 | 0.592 |
| 3 | 0.641 | 0.624 | 0.609 | 0.593 | 0.579 | 0.564 | 0.551 | 0.537 | 0.524 | 0.512 | 0.500 | 0.488 | 0.477 | 0.466 | 0.455 |
| 4 | 0.552 | 0.534 | 0.516 | 0.499 | 0.482 | 0.467 | 0.451 | 0.437 | 0.423 | 0.410 | 0.397 | 0.384 | 0.373 | 0.361 | 0.350 |
| 5 | 0.476 | 0.456 | 0.437 | 0.419 | 0.402 | 0.386 | 0.370 | 0.355 | 0.341 | 0.328 | 0.315 | 0.303 | 0.291 | 0.280 | 0.269 |
| 6 | 0.410 | 0.390 | 0.370 | 0.352 | 0.335 | 0.319 | 0.303 | 0.289 | 0.275 | 0.262 | 0.250 | 0.238 | 0.227 | 0.217 | 0.207 |
| 7 | 0.354 | 0.333 | 0.314 | 0.296 | 0.279 | 0.263 | 0.249 | 0.235 | 0.222 | 0.210 | 0.198 | 0.188 | 0.178 | 0.168 | 0.159 |
| 8 | 0.305 | 0.285 | 0.266 | 0.249 | 0.233 | 0.218 | 0.204 | 0.191 | 0.179 | 0.168 | 0.157 | 0.148 | 0.139 | 0.130 | 0.123 |
| 9 | 0.263 | 0.243 | 0.225 | 0.209 | 0.194 | 0.180 | 0.167 | 0.155 | 0.144 | 0.134 | 0.125 | 0.116 | 0.108 | 0.101 | 0.094 |
| 10 | 0.227 | 0.208 | 0.191 | 0.176 | 0.162 | 0.149 | 0.137 | 0.126 | 0.116 | 0.107 | 0.099 | 0.092 | 0.085 | 0.078 | 0.073 |
| 11 | 0.195 | 0.178 | 0.162 | 0.148 | 0.135 | 0.123 | 0.112 | 0.103 | 0.094 | 0.086 | 0.079 | 0.072 | 0.066 | 0.061 | 0.056 |
| 12 | 0.168 | 0.152 | 0.137 | 0.124 | 0.112 | 0.102 | 0.092 | 0.083 | 0.076 | 0.069 | 0.062 | 0.057 | 0.052 | 0.047 | 0.043 |
| 13 | 0.145 | 0.130 | 0.116 | 0.104 | 0.093 | 0.084 | 0.075 | 0.068 | 0.061 | 0.055 | 0.050 | 0.045 | 0.040 | 0.037 | 0.033 |
| 14 | 0.125 | 0.111 | 0.099 | 0.088 | 0.078 | 0.069 | 0.062 | 0.055 | 0.049 | 0.044 | 0.039 | 0.035 | 0.032 | 0.028 | 0.025 |
| 15 | 0.108 | 0.095 | 0.084 | 0.074 | 0.065 | 0.057 | 0.051 | 0.045 | 0.040 | 0.035 | 0.031 | 0.028 | 0.025 | 0.022 | 0.020 |
| 16 | 0.093 | 0.081 | 0.071 | 0.062 | 0.054 | 0.047 | 0.042 | 0.036 | 0.032 | 0.028 | 0.025 | 0.022 | 0.019 | 0.017 | 0.015 |
| 17 | 0.080 | 0.069 | 0.060 | 0.052 | 0.045 | 0.039 | 0.034 | 0.030 | 0.026 | 0.023 | 0.020 | 0.017 | 0.015 | 0.013 | 0.012 |
| 18 | 0.069 | 0.059 | 0.051 | 0.044 | 0.038 | 0.032 | 0.028 | 0.024 | 0.021 | 0.018 | 0.016 | 0.014 | 0.012 | 0.010 | 0.009 |
| 19 | 0.060 | 0.051 | 0.043 | 0.037 | 0.031 | 0.027 | 0.023 | 0.020 | 0.017 | 0.014 | 0.012 | 0.011 | 0.009 | 0.008 | 0.007 |
| 20 | 0.051 | 0.043 | 0.037 | 0.031 | 0.026 | 0.022 | 0.019 | 0.016 | 0.014 | 0.012 | 0.010 | 0.008 | 0.007 | 0.006 | 0.005 |
| 21 | 0.044 | 0.037 | 0.031 | 0.026 | 0.022 | 0.018 | 0.015 | 0.013 | 0.011 | 0.009 | 0.008 | 0.007 | 0.006 | 0.005 | 0.004 |
| 22 | 0.038 | 0.032 | 0.026 | 0.022 | 0.018 | 0.015 | 0.013 | 0.011 | 0.009 | 0.007 | 0.006 | 0.005 | 0.004 | 0.004 | 0.003 |
| 23 | 0.033 | 0.027 | 0.022 | 0.018 | 0.015 | 0.012 | 0.010 | 0.009 | 0.007 | 0.006 | 0.005 | 0.004 | 0.003 | 0.003 | 0.002 |
| 24 | 0.028 | 0.023 | 0.019 | 0.015 | 0.013 | 0.010 | 0.008 | 0.007 | 0.006 | 0.005 | 0.004 | 0.003 | 0.003 | 0.002 | 0.002 |
| 25 | 0.024 | 0.020 | 0.016 | 0.013 | 0.010 | 0.009 | 0.007 | 0.006 | 0.005 | 0.004 | 0.003 | 0.003 | 0.002 | 0.002 | 0.001 |

