UNIVERSITY
OF
JOHANNESBURG

Department of Finance and Investment Management

Advanced Diploma in Property Valuation and Management / Bridging Programme in Finance

Business Mathematics

ADPVM04/BPIF001

LAST ASSESSMENT OPPORTUNITY

October 2015

Time: 2½ hours   **Marks: 100**

Assessor: Prof G Els

Moderators: Prof I Botha (UJ)
                   Dr Y Stander (Investec)

INSTRUCTIONS:

- This paper consists of **25 pages** (including annexures).

- Clearly PRINT your **initials, surname** and **student number** in the spaces provided on this **question paper.**

- Answer ALL questions on this question paper.

- Please note that questions may have more than one correct answer!

- Silent, non-programmable calculators may be used, unless otherwise instructed.

- Round all calculations to TWO decimal places unless instructed otherwise.

| Surname | | | | | | | | | | | | | Initial(s) | | |

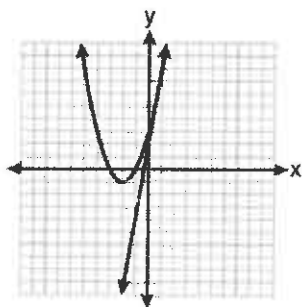| Student number | | | | | | | | | Module code | | | | | 0 |

SECTION A

Basic mathematical knowledge

1.   Given: $X = \{1, 2, 3, 4\}$; $Y = \{2, 3, 4, 5\}$; $Z = \{3, 4, 5, 6\}$. What is the intersection of sets X, Y, and Z?
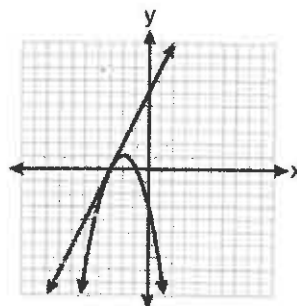
    A $\{3, 4\}$
    B $\{2, 3, 4\}$
    C $\{3, 4, 5\}$
    D $\{1, 2, 3, 4, 5, 6\}$

2.   Which graph could be used to find the solution of the system of equations $y = 2x + 6$ and $y = x^2 + 4x + 3$?
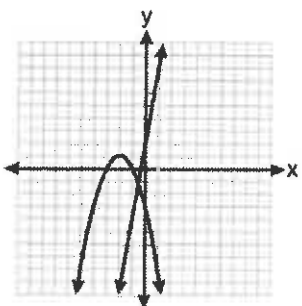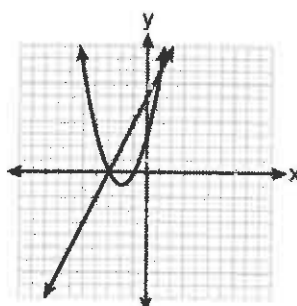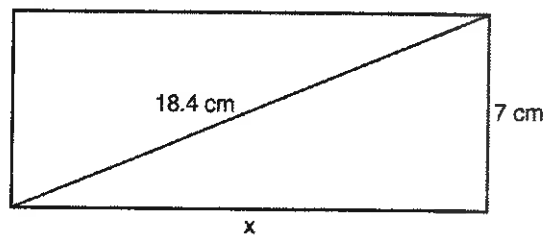
A

B

C

D

3.   What is the value of x in the equation $2(x - 4) = 4(2x + 1)$?

    A -2
    B 2
    C $-\dfrac{1}{2}$
    D $\dfrac{1}{2}$

4.   The rectangle shown below has a diagonal of 18.4 cm and a width of 7 cm.

        To the nearest centimetre, what is the length of x?

        A   11
        B   17
        C   20
        D   25

5.   When $a^3 - 4a$ is factored completely, the result is ...

        A $(a - 2)(a + 2)$
        B $a(a - 2)(a + 2)$
        C $a^2(a - 4)$
        D $a(a - 2)^2$

6.   A student correctly graphed the parabola shown below to solve a given quadratic equation.
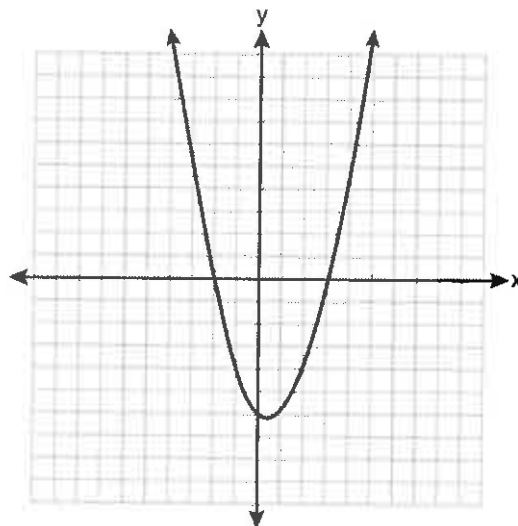
        What are the roots of the quadratic equation associated with this graph?

        A   –6 and 3
        B   –6 and 0
        C   –3 and 2
        D   –2 and 3

7. Which value of x is the solution of the equation $\frac{2}{3}x + \frac{1}{2} = \frac{5}{6}$?

   A $\frac{1}{2}$

   B 2

   C $\frac{2}{3}$

   D $\frac{3}{2}$

8. What is the sum of $\frac{3}{2x}$ and $\frac{7}{4x}$?

   A $\frac{21}{8x^2}$

   B $\frac{13}{4x}$

   C $\frac{10}{6x}$

   D $\frac{13}{8x}$

9. What is the slope of the line whose equation is $3x - 7y = 9$?

   A $-\frac{3}{7}$

   B $\frac{3}{7}$

   C $-\frac{7}{3}$

   D $\frac{7}{3}$

10. If $\frac{ey}{n} + k = t$, what is y in terms of e, n, k and t?

    A $y = \frac{tn+k}{e}$

    B $y = \frac{tn-k}{e}$

    C $y = \frac{n(t+k)}{e}$

    D $y = \frac{n(t-k)}{e}$

11. What is an equation of the axis of symmetry of the parabola represented by $y = -x^2 + 6x - 4$?

    A $x = 3$

    B $y = 3$

    C $x = 6$

    D $y = 6$

12. Which ONE of the following equations has roots of –3 and 5?

   A $x^2 + 2x - 15 = 0$
   B $x^2 - 2x - 15 = 0$
   C $x^2 + 2x + 15 = 0$
   D $x^2 - 2x + 15 = 0$

13. Which ONE of the following expressions can be used to change 75 kilometres per hour to meters per minute?

   A $\frac{75\,km}{1\,hr} \times \frac{1\,km}{1\,000\,m} \times \frac{1\,hr}{60\,min}$
   B $\frac{75\,km}{1\,hr} \times \frac{1\,km}{1\,000\,m} \times \frac{60\,min}{1\,hr}$
   C $\frac{75\,km}{1\,hr} \times \frac{1\,000\,m}{1\,km} \times \frac{1\,hr}{60\,min}$
   D $\frac{75\,km}{1\,hr} \times \frac{1\,000\,m}{1\,km} \times \frac{60\,min}{1\,hr}$

14. Which ONE of the following represents a line that is parallel to the line whose equation is $2x - 3y = 9$?

   A $y = \frac{2}{3}x - 4$
   B $y = -\frac{2}{3}x + 4$
   C $y = \frac{3}{2}x - 4$
   D $y = -\frac{3}{2}x + 4$

15. Which ordered pair is in the solution set of the system of inequalities $y \leq 3x + 1$ and $x - y > 1$?

   A $(-1, -2)$
   B $(2, -1)$
   C $(1, 2)$
   D $(-1, 2)$

16. At Genesis High School, the Grade 8 class has 60 more students than the Grade 9 class. The Grade 10 class has 50 fewer students than twice the students in the Grade 9 class. The Grade 11 class is three times as large as the Grade 9 class.

   If there are a total of 1 424 students at Genesis High School, how many students are in the Grade 9 class?

   A   202
   B   205
   C   235
   D   236

17. The equation $P = 0.0089t^2 + 1.1149t + 78.4491$ models the United States population, P, in millions since 1900. If t represents the number of years after 1900, what is the estimated population in 2025 to the nearest tenth of a million?

    A   217.8
    B   219.0
    C   343.9
    D   356.9

18. The expression $\frac{2x^2+10x-28}{4x+28}$ is undefined when x is …

    A   7 only
    B   −7 only
    C   7 or 2
    D   −7 or 2

19. In a recent town election, 1 860 people voted for either candidate A or candidate B for the position of supervisor. If candidate A received 55% of the votes, how many votes did candidate B receive?

    A   186
    B   837
    C   1 023
    D   1 805

20. The Grade 9 class at a local high school needs to purchase a park permit for R250,00 for their upcoming class picnic. Each ninth grader attending the picnic pays R0,75. Each guest pays R1,25.

If 200 ninth graders attend the picnic, which inequality can be used to determine the number of guests, x, needed to cover the cost of the permit?

    A $0,75x - (1.25)(200) \geq 250,00$
    B $0,75x + (1.25)(200) \geq 250,00$
    C $(0,75)(200) - 1.25x \geq 250,00$
    D $(0,75)(200) + 1.25x \geq 250,00$

[20]

SECTION B

Statistics

21. The test scores for 18 students in a Mathematics class are listed below:

86, 81, 79, 71, 58, 87, 52, 71, 87,
87, 93, 64, 94, 81, 76, 98, 94, 68

Complete the frequency table below by providing the missing figure indicated by the letter **(A)**.

Interval	Tally	Frequency
51 – 60		
61 – 70		**(A)**
71 – 80		
81 – 90		
91 – 100		

(A) = _____

22. The box-and-whisker plot below represents the ages of 12 people.
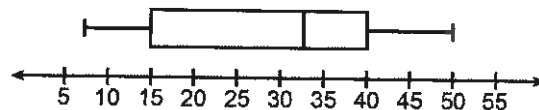
What percentage of these people are **age 15, or older**?

A   25
B   35
C   75
D   85

23. This year, John played in 10 baseball games. In these games he had hit the ball 2, 3, 0, 1, 3, 2, 4, 0, 2, and 3 times. In the first 10 games he plays next year, John wants to increase his average (mean) hits per game by 0.5. What is the total number of hits John needs over the first 10 games next year to achieve his goal?

A   5
B   2
C   20
D   25

24.   Mr Supper recorded the pants size of each student in his class. The results are recorded in the table below.

60	59	70	65	64
61	58	72	75	66
65	67	63	62	68
68	69	74	61	70

Which ONE of the following cumulative frequency histograms represents the data?

A

B

C

D
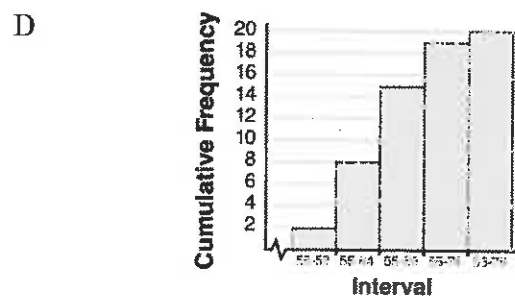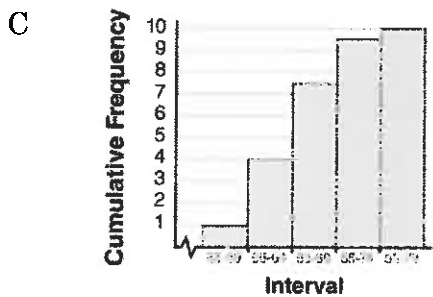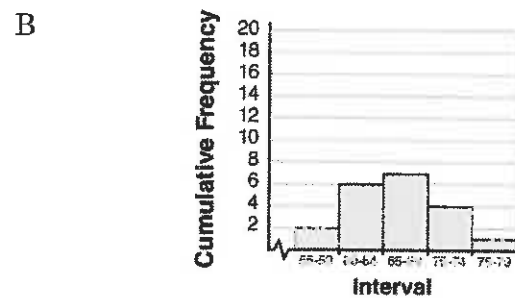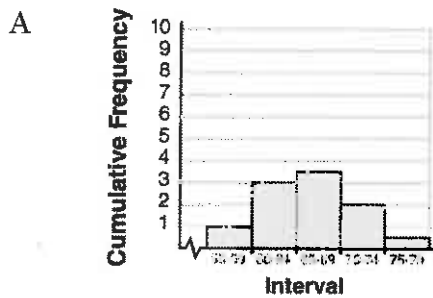
Refer to the following diagram and answer questions 25. – 28.:

The diagram below shows a cumulative frequency histogram of the students' test scores in an algebra class.

Ms. Wedow's Algebra Class Test Scores
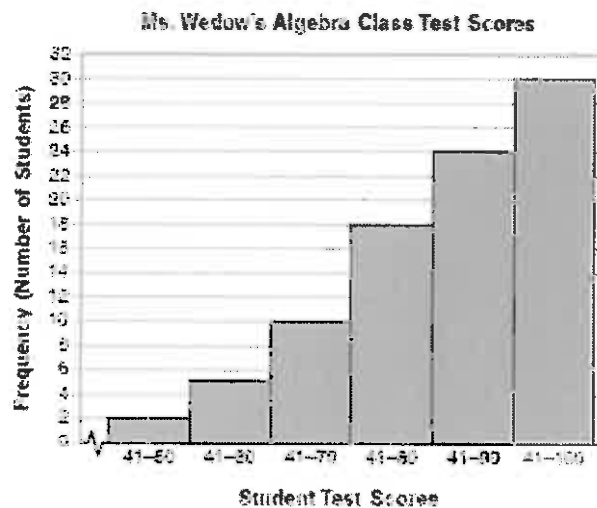
25.   How many students are in the class? _____

26.   Determine how many students scored higher than 70. _____

27.   State which <u>ten-point interval</u> contains the approximate median value. _____

28.   Which TWO of the following ten-point intervals are modal in nature?

    A $41-50$
    B $51-60$
    C $61-70$
    D $71-80$
    E $81-90$
    F $91-100$

29.   The box-and-whisker plot shown below represents the number of magazine subscriptions sold by members of a club.
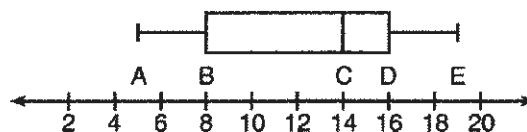
Which statistical measures do points B, D, and E represent, respectively?

    A   Minimum, median, maximum
    B   First quartile, median, third quartile
    C   First quartile, third quartile, maximum
    D   Median, third quartile, maximum

30.   A movie theatre recorded the number of tickets sold daily for a popular movie during the month of June. The box-and-whisker plot shown below represents the data for the number of tickets sold, in hundreds.
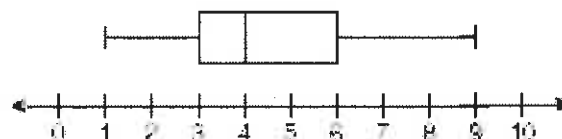
Which ONE correct conclusion can be made using this plot?

    A   The second quartile is 600.
    B   The range of the attendance is 300 to 600.
    C   The mean of the attendance is 400.
    D   Twenty-five percent of the attendance is between 300 and 400.

31.   Sam's grades on eleven chemistry tests were 90, 85, 76, 63, 94, 89, 81, 76, 78, 69, and 97.
      Which ONE of the following statements is true about the measures of central tendency?

      A   mean > mode
      B   mean < median
      C   mode > median
      D   median = mean

32.   The following diagram indicates values in a data set in increasing order and no value is
      repeated.

a	b	c	d	e	f	g

      We also know that:

      ▪ The maximum value is 42
      ▪ The range is 35
      ▪ The median value is 23
      ▪ The difference between the median and the upper quartile is 14
      ▪ Inter-quartile range is 22
      ▪ $e = 2c$
      ▪ the mean value is 25

      Determine the values associated with the letters $a - g$.

      $a =$ [   ] $b =$ [   ]

      $c =$ [   ] $d =$ [   ]

      $e =$ [   ] $f =$ [   ]

      $g =$ [   ]

33.   A tabular summary of a set of data showing the fraction of the total number of items in
      several classes is a ...

      A   frequency distribution.
      B   relative frequency distribution.
      C   frequency.
      D   cumulative frequency distribution.

34.   The total number of data items with a value less than the upper limit for the class is given by the ...

    A   frequency distribution.
    B   relative frequency distribution.
    C   cumulative frequency distribution.
    D   cumulative relative frequency distribution.

35.   If the standard deviation of a population is 9, the population variance is ...

    A   3
    B   9
    C   21.35
    D   81

36.   If the value of first quartile is 49 and the value of third quartile is 60, then value of inter quartile range is ...

    A   21
    B   31
    C   11
    D   41

37.   What effect will extreme scores have on the median of a set of data?

    A   It will have no effect on it
    B   It may tend to raise it
    C   It may tend to lower it
    D   None of the above

38.   If in a discrete series 75% values are less than 30, then ...

    A $Q_3 < 75$
    B $Q_3 < 30$
    C $Q_3 = 30$
    D $Q_3 > 30$

[25]

SECTION C

Probability

39.   A spinner that is equally divided into eight numbered sectors is spun 20 times. The table below shows the number of times the arrow landed in each numbered sector.

Spinner Sector	Number of Times
1	2
2	3
3	2
4	3
5	4
6	2
7	3
8	1

Based on the table, what is the empirical probability that the spinner will land on a prime number on the next spin?

A $\dfrac{9}{20}$

B $\dfrac{11}{20}$

C $\dfrac{12}{20}$

D $\dfrac{14}{20}$

40.   A jar contains 3 chocolate chip cookies and x oatmeal cookies. Two cookies are taken from the jar without replacement. An expression that represents the probability one cookie is chocolate chop and the next cookie is oatmeal is …

A $\left(\dfrac{3}{x+3}\right)\left(\dfrac{x-1}{x+2}\right)$

B $\left(\dfrac{3}{x+3}\right)\left(\dfrac{x}{x+2}\right)$

C $\left(\dfrac{3}{x+3}\right)\left(\dfrac{x-1}{x-2}\right)$

D $\left(\dfrac{3}{x+3}\right)\left(\dfrac{2}{x+2}\right)$

Refer to the following information to answer the questions 41. & 42.:

A trick coin is designed so that the probability that it will land "heads" is $\frac{5}{8}$.

41.   If the coin is flipped three times, the probability that the first two flips are "heads" and the third flip is "tails" is ...

       A $\frac{1}{8}$

       B $\frac{75}{256}$

       C $\frac{75}{512}$

       D $\frac{3}{8}$

42.   If the coin is flipped until exactly two "tails" appear, the probability if will take exactly three flips to obtain the second tail is ...

       A $\frac{1}{8}$

       B $\frac{45}{256}$

       C $\frac{45}{512}$

       D $\frac{3}{8}$

43.   A cube with faces numbered 1 through 6 is rolled 75 times, and the results are given in the table below.

Number	Frequency
1	7
2	22
3	14
4	6
5	20
6	6

Based on these results, which statement is true?

       A $P(\text{odd}) < P(\text{even})$
       B $P(3 \text{ or less}) < P(\text{odd})$
       C $P(\text{even}) < P(2 \text{ or } 4)$
       D $P(2 \text{ or } 4) < P(3 \text{ or less})$

Refer to the following information to answer the questions 44. - 46.:
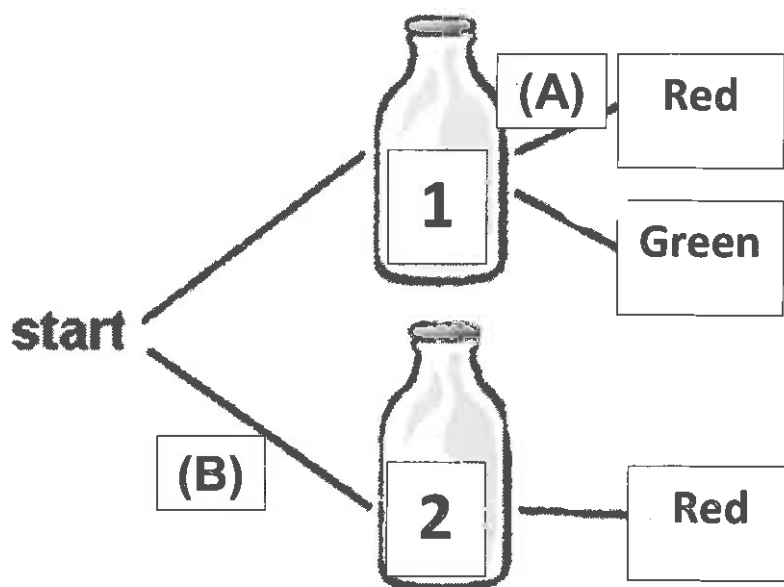
For an experiment there are two identical bottles. Bottle 1 contains 2 green balls and 1 red ball. Bottle 2 contains 2 red balls.

44. The missing value indicated by the letter **(A)** on the tree diagram is ...

    A $\frac{1}{3}$
    B $\frac{2}{3}$
    C $\frac{1}{2}$
    D $\frac{2}{2}$

45. The missing value indicated by the letter **(B)** on the tree diagram is ...

    A $\frac{1}{3}$
    B $\frac{2}{3}$
    C $\frac{1}{2}$
    D $\frac{2}{2}$

46. A bottle is selected at random and a single ball is drawn. What is the probability that the ball is red?

    A $\frac{1}{2}$
    B $\frac{1}{3}$
    C $\frac{1}{6}$
    D $\frac{2}{3}$

Refer to the following information to answer the questions 47. - 49.:

Sixty people were interviewed on their views of violence on TV and the results were recorded in the following table:

	For violence	Against violence	TOTAL
Under 25	10	20	30
Over 25	3	27	30
TOTAL	13	47	60

47.   If a person is chosen at random, calculate the probability that the person is over 25.

   A $\frac{30}{60}$

   B $\frac{13}{60}$

   C $\frac{46}{60}$

   D   None of the above

48.   If a person is chosen at random, calculate the probability that the person is for violence on TV.

   A $\frac{30}{60}$

   B $\frac{13}{60}$

   C $\frac{46}{60}$

   D   None of the above

49.   If a person is chosen at random, calculate the probability that the person is over 25 and for violence on TV.

   A $\frac{3}{13}$

   B $\frac{3}{30}$

   C $\frac{3}{60}$

   D   None of the above

50.   A survey determined that in a particular town 33% of residents jog, 42% cycle and 12% do both activities. The probability that a randomly selected person does neither activity is ...

   A   0.29

   B   0.37

   C   0.61

   D   0.75

Refer to the following information to answer the questions 51. – 53.:

A physical fitness association is including the mile run in its high school fitness test. The time for this event for boys in high school is known to possess a normal distribution with a mean of 440 seconds and a standard deviation of 60 seconds. There is a probability that a randomly selected boy at secondary school can run the mile in less than 302 seconds.

51.   The associated z-value to be used in this calculation is …

A $z = \frac{440 - 302}{60}$

B $z = \frac{302 - 60}{440}$

C $z = \frac{302 - 440}{60}$

D   None of the above

52.   Which ONE of the following indicates the correct probability requirement for the information provided?

A $P(z < 2.3)$

B $P(z < -2.3)$

C $P(z > -2.3)$

D   None of the above

53.   The probability that a randomly selected boy at secondary school can run the mile in less than 302 seconds is …

A   0.9893

B   0.0107

C   0.5107

D   0.4893

Refer to the following information to answer the questions 54. – 56.:

The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60 000 km and a standard deviation of 1 700 km.

54.   What is the probability a particular tire of this brand will last longer than 58 300 km?

A   0.1587

B   0.6587

C   0.3413

D   0.8413

55. What is the probability a particular tire of this brand will last between 61 700 km and 63 400 km?

A   0.1359
B   0.8185
C   0.4772
D   0.3413

56. Which ONE of the following standard normal distributions is correct for the information provided in the previous question?

A

B

C

D

[25]
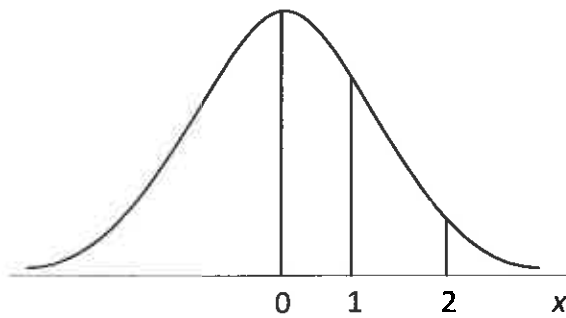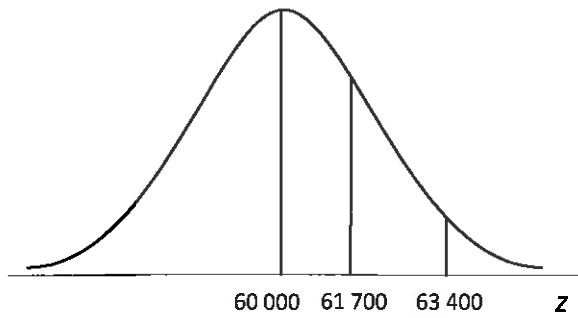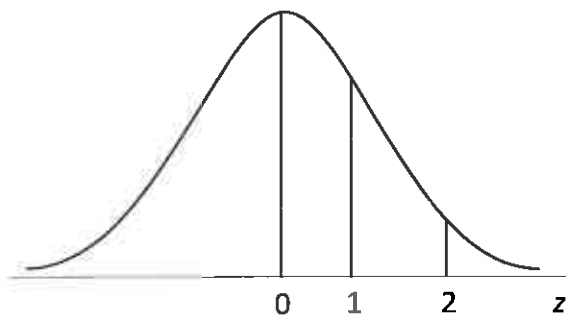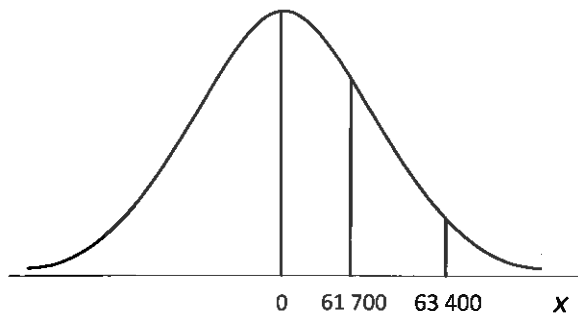
SECTION D

Business forecasting

57. What is the relationship between the independent and dependent variables in the scatter plot shown below?
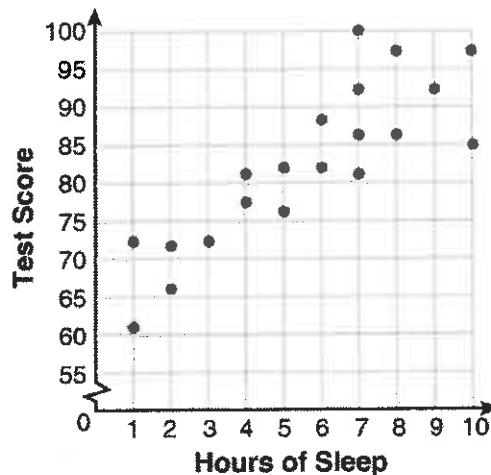
A   undefined correlation
B   negative correlation
C   positive correlation
D   no correlation

58. Which ONE of the following is <u>not</u> an example of seasonal variation?

A   Plant and flower sales
B   Use of electricity
C   Sales of suntan lotion
D   Annual earnings for a large corporation

59. Which ONE of the following is <u>not</u> a component of the multiplicative time series model?

A   Trend
B   Irregular variation
C   Regression trend
D   Seasonality

60. Given a multiplicative time series model, $Z = (T)(S)(C)(I)$, calculating a moving average, and then dividing this multiplication model by the moving average, will isolate which components of the series?

A   T and C
B   T, C, and I
C   S and I
D   T, C, and I

61.   Calculate a three-day moving average for the price of shares for Thursday.

Day	Price
Monday	50.00
Tuesday	52.00
Wednesday	54.00
Thursday	54.50
Friday	60.00

A   54.50
B   54.10
C   54.00
D   none of the above

62.   Which components does a deseasonalized time series contain?

A   all four components
B   T and C
C   T and I
D   T, C and I

63.   The data given below are quarterly sales for a large computer firm.

Quarter	Sales (R'000)
2014-1	105
2014-2	110
2014-3	122
2014-4	120
2015-1	125
2015-1	135

Compute the four-quarter moving average for the first four quarters and centre it at the third quarter.

A   114.25
B   119.25
C   116.75
D   119.50

Refer to the following information to answer the questions 54. – 56.:

The average home price in a popular metropolitan neighbourhood has been charted over the past few years as follows:

Year	Price (R)
2007	1 950 000
2008	2 092 600
2009	2 088 310
2010	2 155 090
2012	2 288 390
2014	2 267 870
2014	2 373 900

In order to formulate a trend, the following calculations were performed:

Year	Period (x)	Price (y)	xy	x^2
2007	1	1 950 000		
2008	2	2 092 600		
2009	3	2 088 310	(A)	
2010	4	2 155 090		
2012	5	2 288 390		(B)
2014	6	2 267 870		
2014	7	2 373 900		
Σ	(C)	15 216 160	62 686 960	140
Averages	(D)	2 173 737		

64. Complete the frequency table below by providing the missing figure indicated by the letters **(A)** to **(D)**.

   (A) = _____

   (B) = _____

   (C) = _____

   (D) = _____

65. Formulate a trend line (with price values expressed in R'000) for home prices in this neighbourhood using the data provided.

   A　　$Y_t = 165.083 + 9.134t$
   B　　$Y_t = 191.341 + 6.508t$
   C　　$Y_t = 187.390 + 8.721t$
   D　　$Y_t = 178.213 + 7.390t$

66.   Economic periods of prosperity followed by recession are described as ...

A   secular trend.
B   seasonal variation.
C   cyclical variation.
D   erratic variation.

Refer to the following information to answer the questions 67. & 68.:

The following linear trend equation was developed for annual sales from 2005 to 2011 with 2005 being year zero:

$$\hat{Y} = 500 + 60t$$

67.   What are the estimated sales for 2015 (in R'000)?

A   R500
B   R560
C   R1 040
D   R1 100

68.   How much are sales increasing by?

A   R60 000 per year
B   R6 000 per month
C   R500 000 per year
D   R6 000 per year

69.   If the least squares equation for sales data going from 2010 to 2014 is $\hat{Y} = 10 + 1.3t$ (in R millions), what is the value of t and the forecast for 2016?

A $t = 6, y = 17.8$
B $t = 0, y = 10.0$
C $t = 7, y = 19.1$
D $t = 10, y = 0.0$

70.   If a quarterly seasonal index is 0.56, it implies that ...

A   the quarter's sales are 56% above the yearly average.
B   the quarter's sales are 56% of the year total sales.
C   the other three quarter percentages will total 44%.
D   the quarter's sales are 56% of the yearly average.

71.   How can you describe the moving average method?

- Useful technique in smoothing out a time series
- Used in measuring seasonal fluctuations
- A technique which does not result in an trend line equation
- A method for identifying a trend

How many of the above descriptions for the 'moving average method' is/are correct?

A   1
B   2
C   3
D   4

72.   The seasonal index for the 1st Quarter is 60.5. If the actual sales for this quarter were R15 000, what is the seasonally adjusted value?

A   247.93
B   24 793
C   9075
D   40.3

73.   In a seasonal index (4 seasons) the total of the quarterly means will be ...

A   4.0.
B   1.0.
C   100%
D   a variable.

74.   If the estimate of the trend component is 158.2, the estimate of the seasonal component is 94%, the estimate of the cyclical component is 105%, and the estimate of the irregular component is 98%, then the multiplicative model will produce a forecast of ...

A   1.53
B   1.53%
C   153.02
D   153 020 532

75.   In the linear trend equation, $T = b_0 + b_1 t$, b_1 represents the ...

A   trend value in period t.
B   intercept of the trend line.
C   slope of the trend line.
D   point in time.

76. You are given the following information on the seasonal-irregular component values for a quarterly time series:

Quarter	Seasonal-Irregular Component Values (S_tI_t)
1	1.23, 1.15, 1.16
2	.86, .89, .83
3	.77, .72, .79
4	1.20, 1.13, 1.17

The seasonal index for Quarter 1 is ...

A   0.997

B   1.18

C   4

D   1

[30]

---oOo---

FORMULAE AND NORMAL DISTRIBUTION TABLE

$$k = 1 + 3{,}3\log(n)$$

$$P(\bar{E}) = 1 - P(E)$$

$$w = \frac{max - min}{k}$$

$$P(A \text{ or } B) = P(A \cup B) = P(A) + P(B)$$

$$P(A \text{ or } B) = P(A \cup B)$$

$$M = l + i\left(\frac{\frac{n}{2} - cf}{f}\right)$$

$$= P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \cap B) = P(A) \times P(B)$$

$$\bar{x} = \frac{\sum x}{n}$$

$$P(A \text{ and } B) = P(A \cap B) = P(B) \times P(A|B)$$

$$\bar{x} = \frac{\sum fx}{\sum f}$$

$$z = \frac{x - \mu}{\sigma}$$

$$y = a + bx$$

$$\bar{x} = \frac{\sum fx_{mid}}{\sum f}$$

$$b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$$

$$IQR = Q_3 - Q_1$$

$$a = \bar{y} - b\bar{x}$$

$$SIQR = \frac{Q_3 - Q_1}{2}$$

$$r = \frac{\sum xy - n\bar{x}\bar{y}}{\sqrt{(\sum x^2 - n\bar{x}^2)(\sum y^2 - n\bar{y}^2)}}$$

$$SD = \sqrt{\frac{\sum x^2}{n} - \bar{x}^2}$$

$$r_{rank} = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$$

$$s = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

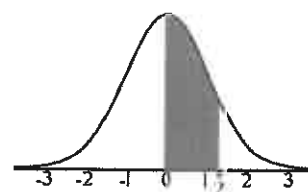$$Y = T \times S \times C \times I$$

$$Y = T + S + C + I$$

$$s = \sqrt{\frac{\sum fx_{mid}^2}{\sum f} - \bar{x}^2}$$

FORMULAE AND NORMAL DISTRIBUTION TABLE

Areas under the normal distribution curve

This table provides the area under normal curve between the mean and the point z standard deviations above the mean. The corresponding area for deviations below the mean can be found by symmetry.

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.091	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.291	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998