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CPA ADVANCED LEVEL

BUSINESS DATA ANALYTICS (PRACTICAL PAPER)

PILOT PAPER

December 2022.

Time allowed: 3 hours.

Answer ALL questions. This paper has TWO sections. SECTION I has twenty (20) Multiple Choice Questions of two (2) marks each. SECTION II has three (3) practical questions of twenty (20) marks each.

Under SECTION II, you are required to create Ms Excel Worksheets with the name of the entity in each question and input your workings and solutions.

SECTION I – TOTAL 40 MARKS

Question One

Which of the following choices provides the correct definition of a data model?

- A. A visual representation of data objects
- B. An organisation of data objects
- C. A conceptual representation of data objects
- D. A graphical representation of data objects (2 marks)

Question Two

The Cross Industry Standard Process for Data Mining (CRISP) requires a data analyst to understand the business as the first step. Which of the following components does **NOT** form part of this activity?

- A. Specific goals and requirements for data mining
- B. An overview of the available data and their quality
- C. Inventory and resources available
- D. Cost benefit analysis (2 marks)

Question Three

Which of the following is the most common goal of statistical modelling?

- A. Inference
- B. Descriptive analysis
- C. Sub-setting
- D. Risk analysis (2 marks)

Question Four

A collection of interesting and useful patterns in database is called _____.

- A. Data Set
- B. Information
- C. Knowledge
- D. Analytics (2 marks)

Question Five

Which of the following is included in a data cleaning report?

- A. Data structure
- B. Data content
- C. Data cleaning activities
- D. Data models (2 marks)

Question Six

Which of the following short-key functions will an analyst use in excel to paste contents into a cell?

- A. Control + F
- B. Control + V
- C. Control + C
- D. Control + U

(2 marks)

Question Seven

The following statements relate to the formula for computing the standard deviation in Ms Excel:

- (i) STDEV.P = Computes the standard deviation of an entire sample
- (ii) STDEV.S = Computes the standard deviation of an entire sample
- (iii) STDEVA = Computes the standard deviation of a selected sample

Which of the following choices is correct?

- A. Statements (i) and (ii) are correct
- B. Statements (i) and (iii) are correct
- C. Statements (ii) and (iii) are correct
- D. All the statements are correct

(2 marks)

Question Eight

Which one is not an array function in Ms Excel?

- A. MMULT
- B. TRANSPOSE
- C. VLOOKUP
- D. None of the above

(2 marks)

Question Nine

_____ is the basic data structure that can be thought of in an SQL table or a spreadsheet data representation.

- A. Series
- B. List
- C. Dataframe
- D. Points

(2 marks)

Question Ten

Which of the following components does **NOT** fall within the realm of “Velocity” in big data?

- A. Processes
- B. Streams
- C. Real-Time
- D. Terabytes

(2 marks)

Question Eleven

Which of the following ‘Vs’ of data provides for data as being authentic, trustworthy and original?

- A. Veracity
- B. Value
- C. Variability
- D. Variety

(2 marks)

Question Twelve

The following statements relate to the definition of the types of data analytics:

- (i) Descriptive analytics provide historical data and information
- (ii) Prescriptive analytics provide data and information for decision making
- (iii) Predictive analytics provide data and information to explain deviation from expected

Which of the following is the correct answer?

- A. Only statement (i) is correct
- B. Only statement (ii) is correct
- C. Only statement (iii) is correct
- D. Only statements (i) and (ii) are correct

(2 marks)

Question Thirteen

Which one ranks highest among the data analytics tools?

- A. Prescriptive analytics
- B. Predictive analytics
- C. Descriptive analytics
- D. Summative analytics

(2 marks)

Question Fourteen

Which of the following is **NOT** a data cleaning strategy?

- A. Removing incorrect data
- B. Removing duplicate data
- C. Fixing data with structural errors
- D. Filling in for missing data

(2 marks)

Question Fifteen

Which of the following software will a data analyst use to clean data?

- A. Data Stage
- B. SQL
- C. Tableau
- D. Microstrategy

(2 marks)

Question Sixteen

The following activities apply to data visualisation:

- 1. The format
- 2. The content
- 3. The structure
- 4. The purpose

Which of the following is the correct order of the activities?

- A. 3,4,2 and 1
- B. 4,3,1 and 2
- C. 3,2,4, and 1
- D. 4, 2,3 and 1

(2 marks)

Question Seventeen

Which of the following graph will likely present better a relationship between variables in data visualisation?

- A. Exploded Pie Chart
- B. Stacked Bar Chart
- C. Progress Line graph
- D. Radar Chart

(2 marks)

Question Eighteen

Which of the following correctly defines composition as a data visualisation technique?

- A. The method of graphical representation of data and information
- B. The method that shows the differences or similarities between values, with and without axes
- C. The method of presenting a part-to-whole relationship of data and information
- D. The method that shows relationships and connections between the data and information

(2 marks)

Question Nineteen

Which of the following people in an organisation will **LEAST** likely be involved in implementing the data protection laws in a country?

- A. Chief Risk Officer
- B. Chief Legal Officer
- C. Chief Information Officer
- D. Chief Executive Officer

(2 marks)

Question Twenty

Under the data protection laws, organisations will have to take steps to demonstrate they know the data they hold, where it is stored, and who it is shared with. This is referred to as:

- A. Data Portability
- B. Data Inventory
- C. Data Traceability
- D. Data Management

(2 marks)

SECTION II – TOTAL 60 MARKS**Question Twenty One**

Amani Pharmaceuticals Limited is a mid-sized firm exploring prospects of future growth. The management of the company has prepared the statement of profit or loss for the year ended 30 June 2022 with forecasts of expected growth rates in the various line items for the next three years.

This information is presented below:

Amani Pharmaceuticals Limited
Statement of profit or loss for the year ended 30 June 2022:

	Sh. "000"	Growth Rates: Scenario		
		Worst	Base	Best
		%	%	%
Revenue	4,500.00	2	5	10
Cost of goods sold	<u>(3,200.00)</u>	2	5	10
Gross Profit	1,300.00			
Other incomes - Investment income	<u>15.00</u>	2	3	4
Total Income	1,315.00			
Administration expenses	(210.00)	5	5	5
Distribution expenses	<u>(210.00)</u>	2	5	10
Earnings before interest, tax, depreciation and amortisation	895.00			
Depreciation and amortisation	<u>(150.00)</u>	5	10	10
Earnings before interest and tax	745.00			
Interest expense	<u>(120.00)</u>	10	10	10
Earnings before tax	625.00			
Income tax expense	<u>(160.00)</u>			
Profit after tax (for the period)	465.00			
Dividends paid	<u>(280.00)</u>	10.00	10.00	10.00
Retained Profit for the year	185.00			
Retained profit b/f	<u>550.00</u>			
Retained Profit c/f	<u>735.00</u>			
Total equity	<u>2,200.00</u>			
Total assets	<u>4,500.00</u>	5%	10%	10%

Additional information:

1. Assume a corporation tax rate of 30%.
2. The growth in equity is only attributable to changes in retained profits.
Hint: In applying the growth rates, ignore changes in opening and closing balances.
3. Total equity will grow only as a result of retained profits.

Required:

- (a) Prepare a spreadsheet showing the forecast statement of profit or loss for the next three years under each of the three scenarios. (10 marks)
- (b) Compute the following metrics for evaluating performance under each scenario:
 - (i) Net profit margin. (2 marks)
 - (ii) Return on assets. (2 marks)
 - (iii) Return on equity. (2 marks)
- (c) Present a summarised dash board with suitable graphs to highlight the revenues and net profit under each scenario. (4 marks)

(Total: 20 marks)

Question Twenty Two

You are provided with the following extracts of the statement of profit or loss and statement of financial position for Darubini Limited for the years ended 30 June 2020, 2021 and 2022:

Darubini Limited

Statement of profit or loss extract for the year ended 30 June (figures in Sh."000"):

	2020	2021	2022
Sales	54,000	64,800	81,000
Cost of sales	<u>(32,400)</u>	<u>(32,400)</u>	<u>(32,400)</u>
Gross profit	21,600	32,400	48,600
Operating expenses	<u>(10,800)</u>	<u>(10,125)</u>	<u>(21,094)</u>
Operating profit	10,800	22,275	27,506
Depreciation	<u>(600)</u>	<u>(800)</u>	<u>(750)</u>
Profit before interest and tax	10,200	21,475	26,756
Finance costs	<u>(5,000)</u>	<u>(7,000)</u>	<u>(9,000)</u>
Profit before tax	5,200	14,475	17,756
Income tax expense	<u>(1,560)</u>	<u>(4,343)</u>	<u>(5,327)</u>
Net profit	<u>3,640</u>	<u>10,133</u>	<u>12,429</u>

Statement of financial position:

Assets:

Non-current assets:

Property, plant and equipment	<u>25,800</u>	<u>45,200</u>	<u>46,700</u>
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Current assets:

Inventory	15,000	21,750	27,488
Receivables	4,500	8,750	15,460
Cash and cash equivalents	<u>0</u>	<u>0</u>	<u>3,823</u>
Total current assets	<u>19,500</u>	<u>30,500</u>	<u>46,771</u>
Total assets	<u>45,300</u>	<u>75,700</u>	<u>93,471</u>

Equity and Liabilities:

Long-term liabilities:

Long term borrowings	<u>33,333</u>	<u>46,667</u>	<u>60,000</u>
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Current liabilities:

Accounts payable	3,750	6,658	7,989
Bank overdraft	<u>5,297</u>	<u>9,322</u>	<u>0</u>
Sub-total	<u>9,047</u>	<u>15,980</u>	<u>7,989</u>

Equity:

Paid up capital	10,000	10,000	10,000
Retained earnings	<u>(7,080)</u>	<u>3,053</u>	<u>15,482</u>
Total equity	<u>2,920</u>	<u>13,053</u>	<u>25,482</u>
Total equity and liabilities	<u>45,300</u>	<u>75,700</u>	<u>93,471</u>

Required:

- (a) Prepare the statement of cash flows for the company for the two years ended 30 June 2021 and 30 June 2022. (8 marks)
- (b) Calculate and comment on the following key ratios:
- (i) Revenue growth rates for the years ended 30 June 2021 and 30 June 2022. (2 marks)
- (ii) Two years' cumulative average revenue growth rate for the year ended 30 June 2022. (2 marks)
- (iii) Return on equity (ROE) for each of the three years. Discuss your results. (2 marks)
- (c) Using the two-years cumulative average revenue growth rate calculated in (b) (ii) above, prepare a one year forecast of the statement of profit or loss for the year ending 30 June 2023. Assume that the vertical ratios for year ended 30 June 2022 apply for the 2023 forecast except that depreciation and finance costs remain constant. Tax is assumed to be at 30%. (6 marks)

(Total: 20 marks)

Question Twenty Three

(a) You are a financial management consultant in an investment firm. A potential client requests you to analyse an investment with the following features:

- The cost of the investment is Sh.10,000,000.
- The investment pays out a sum of Sh.“X” at the end of the first year; this payout grows at the rate of 10 percent per year for 11 years.

Required:

- (i) If your discount rate is 15%, calculate the minimum value of “X” that should attract the investor to make the investment. (3 marks)
- (ii) The respective “NPVs” of the investment if the discount rates were to range between 10% and 15%. (3 marks)
- (iii) Assume that you have three project scenarios as outlined below:

Scenario	Discount rate	Initial cost Sh.	Starting cash flow Sh.	Growth in initial cash flow
Scenario 1	15%	10,000,000	1,500,000	10%
Scenario 2	10%	15,000,000	2,000,000	8%
Scenario 3	13%	20,000,000	4,000,000	7%

Prepare detailed outcomes of the project under each of the above scenarios. (8 marks)

(b) Assume that an investor takes an investment loan of Sh.150,000,000. The loan is for 48 months at an annual interest rate of 15 percent (which the bank translates to a monthly rate of $15\%/12 = 1.25\%$). The payments are to be made at the end of each of the next 48 months.

Required:

- (i) Calculate the monthly payment on the loan. (2 marks)
- (ii) Assume that you have the following options to negotiate with the bank:

Option	Annual interest rate (%)	Term
Option 1	15	48 months
Option 2	18	60 months
Option 3	13	36 months

Use a two-way data table to determine which option would be the most favourable to the investor. (4 marks)

(Total: 20 marks)

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