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CPA ADVANCED LEVEL

BUSINESS DATA ANALYTICS (PRACTICAL PAPER)

WEDNESDAY: 14 December 2022. Morning Paper. Time allowed: 3 hours.

Answer ALL questions in SECTION I and any THREE (3) questions in SECTION II. SECTION I has twenty (20)
Multiple Choice Questions each carrying two (2) marks. SECTION II has five (5) practical questions each carrying twenty (20) marks.

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. You may use the Excel template within the question.

SECTION I - TOTAL 40 MARKS

Question One
Data models evolve from conceptual (that is; a quick, high-level view of the business requirement) to logical (where the entities involved are expanded and include more detail) and finally the physical data model, which can be implemented with specific database provider (like Oracle and SQL Server).

Which of the following choices is correct?

A. The entire statement is true
B. Only the statement on conceptual data model is true
C. Only the statement on logical data model is true
D. Only the statement on physical data model is true (2 marks)
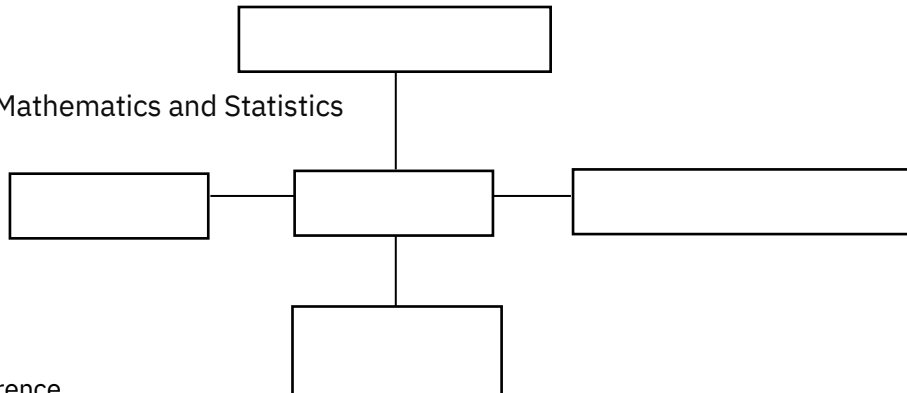
Question Two
Which of the following would be more appropriate to replace the question mark in the following diagram?

Machine Learning

Hacking Skill ? Mathematics and Statistics

Substantive
Research
A. Data analysis

B. Data science
C. Statistical inference
D. Predictive modelling (2 marks)

Question Three

According to cross-industry standard process for data mining, data modelling involves:
A. Obtaining data and information from different sources, processing and storing for future reference
B. Fixing or removing incorrect, corrupted, incorrectly formatted data and information
C. Collecting data and information about business requirements from stakeholders and end users
D. Creating a visual representation of either a whole information system or parts of it to communicate connections
between data points and structures (2 marks)

Question Four

Read the statements below and answer the question that follows:

(i) Data mining relates to turning raw data into useful information.

(ii) Data mining using built-in algorithms should guarantee a result.

Which of the following choices apply?

A. The two statements are true
B. Only the first statement is true
C. Only the second statement is true
D. None of the statements is true (2 marks)

Question Five

Which of the following 'Vs' of data describes data as multifactor, unstructured and dynamic?
A. Veracity
B. Value
C. Variability
D. Variety

(2 marks)

Question Six

Which of the following is an example of discrete data?
A. Number of children
B. Height of children
C. Behaviour of children
D. Test scores of children (2 marks)

Question Seven

Ms Dare Mongare is the Chief Finance Officer of Modern Company Limited. She is using data analytics in estimating future risks that the company is facing and also cash budgeting, with scenario analysis.
By carrying out risk management and cash budgeting, she is applying:
A. Predictive analytics for risk management and cash budgeting
B. Predictive analytics for risk management and prescriptive analytics for cash budgeting
C. Predictive analytics for cash budgeting and prescriptive analytics for risk Management
D. Prescriptive analytics for risk management and cash budgeting (2 marks)

Question Eight

Based on the principles in the Unified Ethical Frame for Big Data Analytics, which of the following applies to the principle of Fairness?
A. Thinking through the potential impacts of our data use on all interested parties
B. Sustainability of the data over time
C. Transparency and inclusivity of the data
D. Data benefiting both the business and customers (2 marks)

Question Nine

Which of the following applications will likely NOT be used for cloud computing?
A. Azure
B. AWS
C. SQL
D. Alibaba Cl (2 marks)
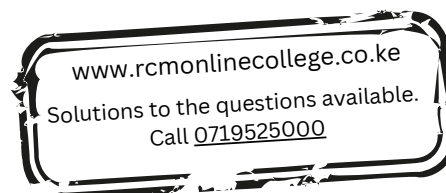
Question Ten

In data science, a relationship between two entities is called _____.
A. Binary
B. Quartenary
C. Unary
D. None of the above (2 marks)

Question Eleven

Which of the following data visualisation tools will likely present a relationship of more than two variables effectively?
A. Scatter Graph
B. Bubble Chart
C. Column Chart
D. Line Chart (2 marks)

Question Twelve

_____ graph displays information as a series of data points connected by straight line segments.
A. Line
B. Bar
C. Scatter
D. Histogram (2 marks)

Question Thirteen

A data breach occurs when the organisation's data suffers a security incident resulting in a breach of confidentiality, availability or integrity. According to the applicable data protection law, in the case of a data breach, the organisation should:
A. Notify the supervisory authority within 48 hours of the incident whether or not it poses a risk to the organisation and affected individuals
B. Notify the supervisory authority within 48 hours of the incident, only if it poses a risk to the organisation and affected individuals
C. Notify the supervisory authority within 72 hours of the incident whether or not it poses a risk to the organisation and affected individuals
D. Notify the supervisory authority within 72 hours of the incident, only if it poses a risk to the organisation and
individuals (2 marks)

Question Fourteen

Data fishing is sometimes referred to as
A. Data bagging
B. Data dredging
C. Data merging
D. Data pooling (2 marks)

Question Fifteen

One of the challenges of big data is the fact that there is so much data, so many techniques and models to analyse the data and several ways to interpret the findings and results. The data analyst should therefore be more sceptical in the following aspects **EXCEPT** on the:
A. Sources of data
B. Data collection
C. Data analysis
D. Assumptions (2 marks)

Question Sixteen

Which of the following is NOT a principle of data protection as provided by the data protection laws in various countries?
A. Process data lawfully
B. Maximise data collection
C. Ensure data quality
D. Limit data processing (2 marks)

Question Seventeen

Two challenges of big data and analytics is inaccessibility of data and low speed of access to data. Which one of the following actions by an organisation will address the two challenges?
A. Providing access to all data to specified employees
B. Providing access to selected data to all employees
C. Restricting access to all data for specified employees
D. A database management system (2 marks)

Question Eighteen

Which of the following is an open source revision/version control system?
A. Numpy
B. Git
C. Scipy
D. Loft (2 marks)

Question Nineteen

Alteryx is an example of a _____.
A. Data management tool
B. Data cleaning tool
C. Data visualisation tool
D. Data presentation tool (2 marks)

Question Twenty

Which of the following formulas in Ms Excel will provide a subtotal of variables provided in a list of vertically listed cells?
A. =sum (A1:H20)

B. =sum (A1:A20)

C. =sum (A1;H20)

D. =sum (A;A20)

SECTION II – TOTAL 60 MARKS

Question Twenty one
You are provided with the following extracts of the statement of profit or loss for Sepetuka Limited:

Sepetuka Limited

Statement of profit or loss extract for the year ended 30 September:

Year	2019 Sh."000"	2020 Sh."000"	2021 Sh."000"	2022 Sh."000"
Sales	54,000	64,800	81,000	95,580
Cost of sales	(32,400)	(32,400)	(32,400)	(38,232)
Gross profit	21,600	32,400	48,600	57,348
Operating expenses	(10,800)	(10,125)	(21,094)	(14,934)
Operating profit	10,800	22,275	27,506	42,414
Depreciation	(600)	(800)	(750)	(900)
Profit before interest and tax	10,200	21,475	26,756	41,514
Finance costs	(5,000)	(7,000)	(9,000)	(8,000)
Profit before tax	5,200	14,475	17,756	33,514
Income tax expense	(1,560)	(4,343)	(5,327)	(10,054)
Profit after tax	3,640	10,132	12,429	23,460

Out of 8

Required:

(a) Calculate and interpret the following ratios:

(i) Annual revenue growth rates for years 2020, 2021 and 2022. (3 marks)

(ii) Three years cumulative average growth rate (CAGR) for year 2022. (3 marks)

(iii) Effective tax rate for the period 2019 to 2022. (2 marks)

(b) Now assume the following for Sepetuka Limited:

1. Revenue growth rates are forecast under three scenarios namely base case, optimistic case and pessimistic case. The base case growth rate for the first year forecast is the 2022 CAGR. This is expected to reduce by 2% annually until the last year of the forecast subject to a minimum of 15%. The optimistic case is 20% above the base case while the pessimistic case is 10% below the base case in all forecast periods.

2. Gross profit margin for the first year of the forecast is the 3-year average for the period from year 2020 to year 2022. This is expected to reduce by 2% annually until the last year of the forecast subject to a minimum of 50%.

3. Operating expense ratios are modelled as 3-year averages for the period from 2020 to 2022. These are assumed to remain constant over the forecast period.

4. Depreciation to revenue ratio is assumed to remain constant as the 3-year average for the period 2020 to 2022.

5. Finance costs are expected to reduce steadily as the loans are repaid. Use the reduction rate in year 2022 over the forecast period.

6. Income tax expense is calculated as the historical effective tax rate.

Required:

Prepare five-year forecast statements of profit or loss for Sepetuka Limited from year 2023 to year 2027.

(12 marks)
(Total: 20 marks)

Question Twenty two

Mrs Jane Wakwa is the Marketing Director of Vuma Limited, a company that makes and sells electronic devices.

The company is considering the launch of a new mobile phone model branded "Trex". The available data is not fully reliable though Jane still feels that she can make a recommendation on whether or not to launch "Trex".

Additional information:

1. Trex is estimated to have a shelf life of five years commencing year 2023.
2. Trex will require the purchase of a machine at a cost of Sh.100 million at the end of year 2022, after which the machine will be sold for Sh.20 million at the end of the fifth year.
3. The selling price and cost structures of Trex (for the first year 2023) with expected inflation factors are as follows:

Sh. Inflation rate (%) - from year 2024 onwards

(Per unit)
Selling price 5,000 2%
Material costs 2,000 4%
Direct labour costs 1,000 5%
Incremental fixed cost (excludes depreciation) 500 10%

4. The company is eligible for capital allowances (depreciation for tax purposes) at the rate of 25% on reducing balance.
5. At the end of the project when the machine is sold, any gain or loss on disposal will be considered for tax.
6. The tax rate on income and capital allowances is at the rate of 30% per annum. Assume that the tax for a given period is paid in the same year.
7. The project will require an initial investment in working capital of Sh.20 million which will be increasing by Sh.5 million at the end of each year to cater for general inflation. The whole amount together with the periodic increase will, however, revert at the end of the project.
8. Experience has shown that demand for new products is not exactly known in year one but tends to be stable thereafter. Jane has come up with the following estimates of demand for year 2023.
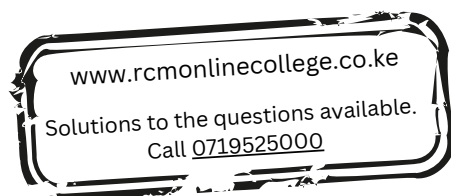
Probability Expected sales (Units)
30% 40,000
40% 30,000
30% 10,000

Jane expects an initial increase in demand in year 2024 of 25% then a decline of 50% in year 2025. This level will remain the same till the end of the project.

9. Vuma Limited has a real weighted average cost of capital (WACC) of 8% and general inflation is expected to be at 4%.

Due to the risk of the project, Jane feels that the relevant nominal WACC should be increased by 3%.

Required:

Compute the following:

(a) The weighted average cost of capital to be used to evaluate the project. (2 marks)

(b) The relevant cash flows over the project period. (15 marks)

(c) The net present value (NPV) of the project. Advise on the viability of the project. (3 marks)

(Total: 20 marks)

Question Twenty three

You are evaluating a four-year project with an initial investment of Sh.10,000,000 on 1 January 2023 and the following cash flow characteristics:

Date Cash flow (Sh.)

| Date	Cash flow (Sh.)
1 January 2023	(10,000,000)
30 June 2023	2,750,000
31 July 2024	4,250,000
30 September 2025	3,250,000
31 December 2026	2,750,000
The discount rate is given as 8%.	

Required:
(a) (i) Calculate the NPV and XNPV of the project and hence determine whether the project is viable. (6 marks)

(ii) Highlighting the cause of the difference between NPV and XNPV, explain which one you would use in your analysis and why. (4 marks)

(b) (i) Calculate the IRR and XIRR of the project and hence determine whether the project is viable. (6 marks)

(ii) Highlighting the cause of the difference between IRR and XIRR, explain which one you would use in your analysis and why. (4 marks)

(Total: 20 marks)
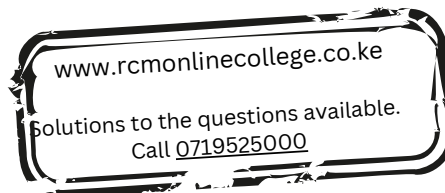
Question Twenty four

Bamuda Limited presented the following financial statements for the years ended 30 June 2021 and 30 June 2022:

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

Sh.“million” Sh.“million”
Revenue 473
Cost of sales (229)
Gross profit 244
Gain on financial assets at fair value 5
Investment income 6
255
Other expenses
Administration expenses 48
Distribution costs 76
Finance costs 17 (141)
Profit before tax 114
Income tax expense (47)
Profit after tax for the year 67

Statement of financial position as at 30 June:

Sh.“million” Sh.“million”
Assets: 2022 2021
Non-current assets:
Property, plant and equipment 327 264
Intangible assets 40 50
Financial assets through other comprehensive income (OCI) 22 10

389 324
Current assets:
Inventory 123 176
Trade receivables 95 87
Financial assets at fair value 65 30
Cash and cash equivalents 29 312 0 293
Total assets 701 617

Equity and liabilities:
Equity:
Ordinary share capital (Sh.10 each) 230 150
Share premium 30 0
Revaluation reserve 36 67
Finacial assets through OCI - equity reserve 2 0
Retained profits 121 91

419 308
Non-current liabilities:
10% convertible loan stock 100 150
Current liabilities:
Bank overdraft 22
Trade payables 156 100
Interest payable 7 3
Income tax payable 19 182 34 159
Total liabilities 282 309
Total equity and liabilities 701 617

Additional information:

1. Property, plant and equipment held by Bamuda Limited are items of plant and equipment and freehold premises.
During the year ended 30 June 2022, items of plant and equipment which originally cost Sh.40 million were disposed of resulting in a loss of Sh. 6 million charged in administrative expenses. These items had a net book value of Sh.28 million as at the date of disposal.
2. Depreciation charge for the year ended 30 June 2022 was Sh.43 million.

3. Sh.50 million of convertible loan stock was converted to Sh.50 million ordinary share capital at par during the year ended 30 June 2022.

Required:

Prepare the statement of cash flows for Bamuda Limited for the year ended 30 June 2022 as per IAS 7 "Statement of Cash Flows".

(Total 20 marks)

Question Twenty five

Farmgate Company Limited produces and sells shovels.

The company provides the following data for quantities of shovels produced and the related production cost for the calendar year 2021:

Month Quantity Production cost
(year 2021) produced (units) Sh.

January 150,000 18,000,000

February 120,000 14,000,000
March 200,000 23,000,000
April 170,000 19,000,000
May 120,000 16,000,000
June 250,000 30,000,000
July 220,000 27,000,000
August 90,000 11,000,000
September 180,000 24,000,000
October 300,000 32,000,000
November 280,000 29,000,000
December 350,000 36,000,000

Required:

(a) Determine the variable cost per unit and the total variable costs using regression analysis. (6 marks)

(b) Estimate the total production cost if the following number of units are produced:

(i) 100,000 units

(ii) 150,000 units

(iii) 200,000 units

Include the lower and upper boundaries at 95% confidence intervals.

(12 marks)

(c) Prepare a chart plotting the predicted Y versus the actual Y from the regression function determined in (a) above.

Interpret your answer. (2 marks)

(Total 20 marks)

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