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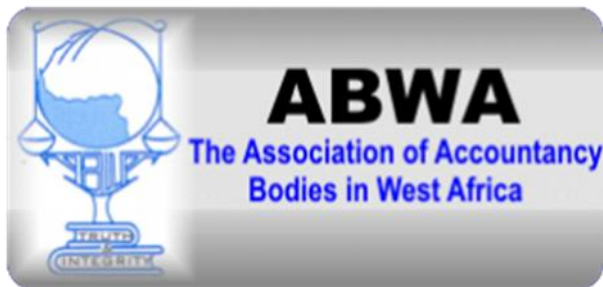
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF NIGERIA

INSIGHT

SEPTEMBER 2024 ATSWA EXAMINATIONS PART II

Question Papers Suggested Solutions and Examiners' Comments

TABLE OF CONTENTS

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

ABWA

The Association of Accountancy Bodies in West Africa

ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
SEPTEMBER 2024 EXAMINATIONS (PART II)
FINANCIAL ACCOUNTING

PLEASE READ THESE INSTRUCTIONS BEFORE COMMENCEMENT OF THE PAPER

EXAMINATION INSTRUCTIONS

1. All solutions should be in ink. Any solution in pencil will not be marked.

2. Read all instructions on each part of the paper carefully before answering the questions.

3. Ensure that you do not answer more than the number of questions required for **Section B (The Essay Section).**

4. Check your pockets, purse and mathematical sets, etc to ensure that you do not have prohibited items such as telephone handset, electronic storage device, wrist watches, programmable devices or any form of written material on you in the examination hall. You will be stopped from continuing with the examination and liable to further disciplinary actions including cancellation of examination result if caught.

5. Do not enter the hall with anything written on your docket.

6. Insert your examination number in the space provided above.

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
PART II EXAMINATIONS – SEPTEMBER 2024

FINANCIAL ACCOUNTING

Time Allowed: 3 hours

SECTION A: PART I   MULTIPLE-CHOICE QUESTIONS   (30 Marks)

ATTEMPT ALL QUESTIONS IN THIS SECTION

Write ONLY the alphabet (A, B, C, D or E) that corresponds to the correct option in each of the following questions/statements

1. The responsibility for accounting information contained in the annual reports and accounts of a public limited liability company ultimately rests with

    A. Director of Finance
    B. External Auditors
    C. Chief Executive Officer
    D. Board of Trustees
    E. Board of Directors

2. Financial information presented to influence the making of an economic decision in order to achieve a predetermined objective contradicts which of the following qualitative characteristics?

    A. Verifiablity
    B. Relevance
    C. Completeness
    D. Faithful representation
    E. Timeliness

3. Which of the following is **NOT** a benefit of adopting IFRS in presenting accounting information of an entity?

    A. Improved transparency and comparability in financial reporting for the use of investors and rating agencies
    B. Availability of dedicated and appropriate skilled resources
    C. Better management control due to easy communication of financial information
    D. Easier to comply with the reporting requirements of overseas stock exchanges
    E. Reduced cost of financial reporting for global companies

4. The owner of Diamond Enterprises included his personal money of ₦1,500,000 in the business bank. The Generally Accepted Accounting Principle (GAAP) concept violated by this transaction is

    A. Money measurement
    B. Going Concern
    C. Entity
    D. Periodicity
    E. Duality

5. Which of the following threats occurs where a Professional Accountant prepares the annual financial statements for a client and later appointed as auditor?

    A. Self-review threats
    B. Intimidation threats
    C. Self-interest threats
    D. Familiarity threats
    E. Advocacy threats

6. The source document required to post returns outwards book is

    A. Debit Note
    B. Invoice
    C. Credit Note
    D. Payment Note
    E. Source Note

7. The necessary Journal entries required to write off Bad debts account from the books of Acada Enterprises for the year ended December 31, 2021, are

	Dr.	**Cr.**
A.	Profit or loss Account	Bad debts Account
B.	Bad debts Account	Trade receivable Account
C.	Profit or loss Account	Allowance for Doubtful debts Account
D.	Allowance for Doubtful debts	Profit or loss Account
E.	Trade receivable Account	Profit or loss Account

Use the following information to answer questions 8 - 9

The balances extracted from the books of Makeup Enterprises as at December 31, 2021 were: Trade Receivables ₦4,800,000; Allowance for doubtful debts ₦100,000; Additional information: Bad debts to be written off ₦20,000 and allowance for doubtful debts is to be 3% of Trade receivables.

8. What will be the allowance for doubtful debts for the year ended December 31, 2021?

   A.   ₦43,200
   B.   ₦43,400
   C.   ₦83,400
   D.   ₦103,400
   E.   ₦143,200

9. What will be the value of trade receivable to be reflected in the Statement of Financial Position as at December 31, 2021?

   A.   ₦4,148,600
   B.   ₦4,228,000
   C.   ₦4,236,000
   D.   ₦4,236,600
   E.   ₦4,636,600

10. On January 1, 2019, a fairly used car was bought at a cost of GH¢500,000 and depreciated at 20% per annum using reducing balance method. On April 1, 2021, it was sold for GH¢300,000. What is the profit or loss on disposal?

    A.   GH¢20,000 loss
    B.   GH¢40,000 loss
    C.   GH¢3,500 Profit
    D.   GH¢4,000 loss
    E.   GH¢20,000 profit

11. On 1 January, 2021, a business enterprise that prepares its account to December 31, paid an Insurance premium of GH¢202,500 for period ending March 31, 2022.

    How much of the premium paid will be expensed in 2021 Income Statement?

    A.   GH¢40,000
    B.   GH¢40,500
    C.   GH¢50,700
    D.   GH¢162,000
    E.   GH¢202,500

12. The accounting entries required to record the value of Goodwill in the books of a partnership business on retirement of an old partner is

	Dr.	**Cr.**
A.	Partners' Capital Account	Goodwill Account
B.	Goodwill Account	Partners' Capital Account
C.	Realisation Account	Goodwill Account
D.	Goodwill Account	Realisation Account
E.	Goodwill Account	Revaluation Account

Use the following information to answer questions 13 -14

Ajax and United are in partnership with the following relevant information for the year ended December 31, 2021.

	Ajax	United
	L$	L$
Capital	1,500,000	2,500,000
Interest on Capital per annum	3%	3%
Drawings for the year	300,000	400,000
Interest on Drawings	4%	4%
Profit or loss sharing ratio	$^2/_5$	$^3/_5$

The net profit for the year ended December 31, 2021, is L$2,800,000

13. What is the distributable profit for the year ended December 31, 2021?

    A.   L$2,680,000
    B.   L$2,708,000
    C.   L$2,762,000
    D.   L$2,772,000
    E.   L$2,800,000

14. What is the net income realised by Ajax from the partnership?

    A.   L$1,083,000
    B.   L$1,116,200
    C.   L$1,120,000
    D.   L$1,128,000
    E.   L$1,624,000

15. The mark-ups of Venus Enterprises were ¼ and $^1/_3$ on Commodities X and Y. What are the Profits margins percentage of these commodities?

	X	Y
A.	$33^1/_3$%	17%
B.	25%	20%
C.	17%	$33^1/_3$%
D.	$33^1/_3$%	25%
E.	20%	25%

Use the following information to answer questions 16 - 17

High Flier Social Club has subscriptions account balances in its books for the year ended December 31, 2021
1 January, 2021: In advance Le64,000 and in arrears Le100,000
31 December, 2021: In advance Le28,000 and in arrears Le20,000

Subscriptions received during the year
            2020 - Le80,000
            2021 - Le620,200
            2022 - Le8,000

16. Determine the amount of members' subscriptions to be recognised in the Income and Expenditure account of the Club for 2021

    A.   Le620,000
    B.   Le628,000
    C.   Le664,000
    D.   Le708,000
    E.   Le756,000

17. The balance carried down (c/d) on the debit side of the Subscriptions Accounts in the books of High Fliers Social club reveals members

    A.   Who have prepaid their subscriptions
    B.   Who have paid life membership subscriptions
    C.   Who are financiers of the club
    D.   Whose subscriptions have fallen due and are yet to pay
    E.   Who may become insolvent in future

18. Ejalonibu Plc. has authorised share capital of ₦12,000,000, ₦0.50 ordinary shares of which 10,000,000 shares were issued and fully paid at ₦120 per share. At the end of December 31, 2021, the company declared and paid 5% dividend.

    How much is the dividend declared and paid?

    A.   ₦250,000
    B.   ₦300,000
    C.   ₦325,000
    D.   ₦500,000
    E.   ₦624,000

19. The authorised share capital of a limited liability company is the number of shares approved

    A.   In the Articles of Association
    B.   At the Annual General Meeting
    C.   In the Memorandum of Association
    D.   In the Annual Financial statement and reports
    E.   By the Ministry of Commerce and Industries

20. Which of the underlisted method of valuing inventory yields higher taxable income during periods of inflation?

    A. First In, First out (FIFO)
    B. Last In, First Out (LIFO)
    C. Weighted Average Method
    D. Periodic Simple Average Method
    E. Standard Price Method

21. The Ratio on Non-Current assets to capital employed reveals the disposition or usage of funds between Non-Current Assets and

    A. Current Assets
    B. Working Capital
    C. Current Liabilities
    D. Investment
    E. Borrowed fund

22. The accounting ratio that serves as an overall guide to management efficiency of a business is

    A. Gross Profit to Gross Sales
    B. Inventory to cost of sales
    C. Purchase to Trade Payable
    D. Net profit to Capital Employed
    E. Sales to Receivables

Use the following information to answer Questions 23 & 24

Extracted from the books of Larry Nigeria Limited are

	GMD
Opening trade Payables	200,000
Closing trade Payables	220,000
Purchases	2,260,000
Opening trade Receivables	160,000
Closing trade Receivables	120,000
Revenue	5,200,000
Cash paid to employees	1,620,000
Cash paid for General Expenses	480,000

23. Determine the cash received from customers and paid to suppliers

    A. GMD220,000   and   GMD524,000
    B. GMD224,000   and   GMD520,000
    C. GMD520,000   and   GMD224,000
    D. GMD2,240,000   and   GMD5,240,000
    E. GMD5,240,000   and   GMD2,240,000

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24. Using direct method of presenting statement of cash flow, what is the Cash flow from operation?

    A.   GMD480,000
    B.   GMD524,000
    C.   GMD900,000
    D.   GMD1,600,000
    E.   GMD1,620,000

25. Financial statement information can be compromised by arbitrary revaluation of Non-current assets in order to

    A.   Reduce Capital employed/Debt ratio
    B.   Reduce Equity/total assets ratio
    C.   Reduce total assets/debt ratio
    D.   Reduce debt/equity ratio
    E.   Reduce capital employed/equity ratio

26. One of the motivations for unethical financial reporting by an economic entity is self-review threat which is an attempt by management to

    A.   Reduce tax liabilities
    B.   Douse tension from company's competitors
    C.   Reduce conflict of interest
    D.   Defend the organisation in a lawsuit
    E.   Depict healthy financial outlook in order to conceal material losses

27. Which of the following is **NOT** a limitation to computerised accounting system?

    A.   Faster technological obsolescence
    B.   Data are prone to hacking
    C.   Inefficient record keeping
    D.   Data and Information can be lost or corrupted due to power interruption
    E.   Garbage in - Garbage out

28. The set-back associated with cash basis of accounting does **NOT** include

    A.   Matching cost with income, in order not to distort profits
    B.   Unearned income and liability accounts are not reported
    C.   Non-disclosure of income that has not been invoiced or received
    D.   Disallow tracking actual sales and purchases
    E.   Non-current assets utilisation in a form of depreciation is ignored

29. When a seller of goods received damaged goods from the buyer and the goods were not replaced, the seller issues

    A. Pro-forma invoice
    B. Debit note
    C. Credit note
    D. Goods returned note
    E. Goods returned Inwards note

30. Which of the following **CANNOT** be found in Non-Current Assets schedule?

    A. Useful life or rate of depreciation of the assets
    B. Cost of assets pledged on security
    C. Total cost price of the assets
    D. Accumulated depreciation
    E. Class of the assets

SECTION A: PART II   SHORT-ANSWER QUESTION   (20 MARKS)

ATTEMPT ALL QUESTIONS

Write the correct answer that best completes each of the following questions/statements

1. Sammy Enterprises when presenting its statement of financial position at the end of the year, a Motor Vehicle that cost ₦700,000 was valued ₦1,300,000 an amount reflecting the effects of inflation on the economy. The generally acceptable accounting principles violated by stating ₦1,300,000 as the value of the motor car in the Statement of Financial Position is ....

2. The methods adopted by an economic entity for applying fundamental accounting concepts to its financial transactions is..............................

3. Going concern concept assumes that an established entity will operate in perpetuity. This assumption is used for the preparation of ....

4. The value of goods returned by a debtor for defective or not to specification goods is recorded in ....

5. Two methods of valuation of subsequent acquisition of property plant and equipment are .... and ....

6. When a provision for depreciation account is maintained, the journal entries necessary to record annual depreciation charge shall be ....

7. Cash payment of ₦250,000 was wrongly posted as receipt in the cash book. The necessary journal entries to correct this error are .... and ....

8. The trial balance of Join-us-Enterprises failed to agree, and it was discovered that purchases day book was overcast by GH¢90,000. The necessary journal entries to correct this error are .... and ....

9. In amalgamation of partnership businesses, the necessary journal entries to adjust for the value of the assets not to be taken over by the new business are .... and ....

10. The necessary accounting entries to record the adjustments arising from the loss on the assets taken over by the partners at the termination of the business are .... and ....

11. The necessary accounting entries required to write off excess provisions for realisation expenses in the partnership books at termination of business are .... and ....

    Use the following information to answer questions 12 & 13

    Member's subscriptions information of Forward Ever Social Group are as follows:

    January 1, 2021;   In advance ₦32,000
                        In arrears ₦50,000

    December 30, 2021; In advance ₦14,000
                        In arrears ₦10,000

    Total subscriptions received in 2021 is ₦354,000
                        2020 - ₦40,000
                        2021 - ₦310,000
                        2022 -?

12. The subscriptions to be reflected in the Income and Expenditure account for year 2021 is ....

13. The Subscriptions for year 2022 received in 2021 is....................

14. The method of issuing inventory based on the assumption that items in store are used or sold in strict chronological order is called.........................

15. Information in respect of closing inventory at the end of the financial year are as follows

Article	Cost	Net Realisable Value/per unit
	Le000	Le000
1	150	120
2	180	225
3	450	600
4	270	255
5	225	195

The value of the closing inventory is ....

16. The art or practice of arranging and presenting accounting information in the final accounts to give good effect in order to be attractive to users without reflecting what was true about the business is called............

17. The formulae for inventory turnover ratio is ....

18. The accounting entries necessary to account for shares to record the amount to be refunded to the subscribers whose application for ordinary shares were partly accepted after paying application and allotment monies in full are .... and ....

19. Financial statements information can be compromised by capitalising operating costs in order to .... profit

20. In a computerised accounting environment, two types of coding systems in use are.................. and ....

SECTION B: ATTEMPT ANY FOUR QUESTIONS   (50 MARKS)
QUESTION 1

A conceptual framework is a system of concepts and principles that underpin the preparation of financial statements.

Required:

Explain **THREE** purposes of the conceptual framework for financial reporting and discuss the **TWO** fundamental qualitative characteristics of financial information.

(Total 12½ Marks)

QUESTION 2

Jekinje Political Association a non-for-profit prepared its account for the year to December 31. They started the year January 1, 2021, with ₦470m in the bank and ended with an overdraft of ₦50m which was secured by the deposit of investment with the bank.

(i) They received subscription from members amounting to ₦835m of which ₦25m represented Arrears, ₦760m current subscription and ₦50m in advance.

(ii) The party received ₦520m as donations to the General fund and ₦850m to Election fund which had ₦15m as at January 1, 2021 and out of which ₦720m was paid for election expenses. There were no separate bank accounts.

(iii) They held government securities (Investment) at January 1, 2021 which cost ₦2,000m. Half were sold for ₦1,250m and the balance valued at ₦1,200m as at December 31, 2021. These investments produced interest of ₦35m during the year.

(iv) Office premises were purchased during the year for ₦1,000m. Legal expenses amounted to ₦105m. Alteration and decorations of the premises cost ₦570m of which ₦150m is still owed.

(v) Office furniture was valued at ₦150m at January 1, 2021. ₦170m was paid for additions during the year and ₦70m is still owed. Depreciation is estimated at 10% per annum.

(vi) The only other receipt was for ₦75m magazine sold. The cost of the magazine amounted to ₦120m out of which ₦60m worth was given away. There was no inventory left at the end of the year.

(i) Other information are as follows:

- Agent's salaries and expenses ₦700m (₦50m relates to next year)
- Office Salaries - ₦350m
- Rent & Rates - ₦170m (₦50m owing at January 1, 2021)
- Meetings & Propaganda - ₦165m (₦30m for a meeting to be held next year)
- Stationeries, postages & sundries - ₦150m
- Interest on Overdraft - ₦15m

You are required to prepare

a. Statement of Income and Expenditure Accounts for the year ended December 31, 2021.   (5 Marks)
b. Statement of Financial Position as at December 31, 2021.   (7½ Marks)

(Total 12½ Marks)

QUESTION 3

The following information is extracted from the financial statements of Krapeh Limited for the year ended August 31, 2022.

	GH¢'000
Revenue	61,970
Cost of goods sold	27,248
Gain from sale of motor vehicle	843
Administration expenses	8,774
Dividends paid on preference shares	1,100
Dividends paid on ordinary shares	3,200
Income tax expense	6,940
Gain on revaluation of property	3,845
Cash received from issue of 6 million ordinary shares	7,500

The balances in the statement of changes in equity as at September 1, 2021 are as follows:

	GH¢'000
Ordinary share capital of GH¢0.50 per share	18,000
Revaluation reserves	6,894
Retained earnings	12,344
General reserves	3,142
Balance relating to non-current liabilities as at September 1, 2021:	
10% cumulative preference shares of GH¢1 per share	11,000

At August 31, 2022, the management of Krapeh Limited recommended that GH¢1,149,000 should be transferred to general reserves.

Required:

a. Prepare the Statement of Profit or Loss and Other Comprehensive Income for the year ended August 31,2022 (5½ Marks)

b. Prepare the Statement of Changes in Equity for the year ended August 31, 2022 (7 Marks)

(Total 12½ Marks)

QUESTION 4

a. Explain why ethics is important to professional accountants. (5 Marks)
b. Explain the ethical considerations a professional accountant should make to ensure that they are compliant with financial legislations. (7½ Marks)

(Total 12½ Marks)

QUESTION 5

The trial balance of Horizon Limited for the year ended June 30, 2021, is as follows:

	L$
Inventory July 1, 2020	122,580
Revenue	979,200
Purchases	641,120
Salaries and wages	199,850
Motor vehicle	258,750
Furniture and fittings	111,240
Insurance	49,590
Electricity expenses	24,140
Trade receivable	201,600
Trade payable	89,600
Cash and bank	87,030
Capital	627,100

You are provided with the following additional information.

(i)   Inventory as at June 30, 2021 is L$152,460

(ii)   Electricity outstanding as at June 30, 2021 amounted to L$3,110

(iii)   Depreciation provision are as follows:
Motor Vehicle 20%
Furniture and fittings 10%

(iv)   2.5% allowance should be provided on receivable for doubtful debts.

You are required to:

Prepare the extended trial balance showing the final trial balance.

(Total 12½ Marks)

QUESTION 6

Optimist Limited issued 1,000,000 ordinary shares of ₦1.00 each at ₦1.40 per share payable as follows:

(i)   0.35 naira on application
(ii)   0.65 naira on allotment (including premium)
(iii)   0.40 naira on first call

All monies were received on due dates except for ₦100,000 shares not paid on the first call. The holders of 100,000 shares failed to pay up and after some reminders, the shares were forfeited

The shares were re-issued at 0.75naira per share and all the monies were received.

You are required to

a.   Draw up journal entries to record the above transactions   (9½ Marks)

b.   State **FOUR** uses of share premium account.   (3 Marks)
                                                                        (Total 12½ Marks)

SECTION A: PART 1

MULTIPLE-CHOICE SOLUTIONS

1. E
2. D
3. B
4. C
5. A
6. C
7. B
8. B
9. E
10. D
11. D
12. B
13. B
14. B
15. E
16. Bonus
17. A
18. A
19. C
20. A
21. B
22. D
23. E
24. C
25. D
26. E
27. C
28. A
29. C
30. B

Workings

8

	N
Trade receivable balance b/d	4,800,000
Less: Bad debts	20,000
	4,780,000

3% X ₦4,780,000 = 143,400 –b/f prior ₦100,000 =   ₦43,400

9 ₦4,780,000 − ₦143,400 = ₦4,636,600

10

		₦
	Cost	500,000
2019	Depreciation 20% X 500,000	100,000
	Carrying amount 31 Dec 2019	400,000
2020	Depreciation 20% 400,000	80,000
	Carrying amount	320,000
2021	Depreciation $^3/_{12}$ X 20% X 320,000	16,000
	Carrying amount	304,000
	Proceeds	300,000
	Loss	4,000

11 $^{12}/_{15}$ X ₦202,500 = ₦162,000

13 ₦2,800,000+(₦12,000+16,000) − (45,000+₦75,000) =₦2,708,000

14 ₦1,083,200 + (₦45,000 - ₦12,000) = ₦1,116,200

15 X = ¼ +$_1$ = $^1/_5$ X 100 = 20%   OR 25% = 25/125 =20%
Y = $^1/_3$ + ^{1}= ¼ X 100 = 25%   OR 33.33% = $\frac{33.33}{133.33}$ =25%

16

Subscriptions Account

	₦		₦
Balance b/d	100,000	Balance b/d	64,000
Income & Exp.	664,000	Bank – 2020	80,000
Balance c/d	28,000	– 2021	620,000
		– 2022	8,000
		Balance c/d	20,000
	792,000		792,000
Balance b/d	20,000	Balance b/d	28,000

18 Dividend declared and paid by Ejalonibu Plc
10,000,000 shares X ₦0.50   = ₦5,000,000
$^5/_{100}$ X ₦5,000,000   = ₦250,000

23 Cash received from customers ₦160,000 + ₦5,200,000 − ₦120,000 = ₦5,240,000
Cash paid to suppliers = ₦200,000 + ₦2,260,000 − ₦220,000 = ₦2,240,000

24

Cash from operation

	₦
Cash received from Customers	5,240,000
Cash paid to suppliers	(2,240,000)
Cash paid to employees	(1,620,000)
Cash paid for general expenses	(480,000)
	₦900,000

25 Revaluation surplus is
Dr. Non-current Assets Account
Cr. Revaluation surplus
This is added to shareholders equity

Examiner's comments

All the candidates attempted the questions, and they performed well. About 80% of the candidates scored above 50% of the total marks obtainable. The commonest pitfall was the inability of the candidates to cover the whole syllabus.

SECTION A: PART II

SHORT-ANSWER SOLUTIONS

1. Historical Cost Principle/Concept
2. Accounting Basis/Method
3. Financial statements
4. Return inward day book/Return inward journal/Sales return book
5. Cost method and revaluation method
6. Dr. Depreciation Account; Cr. Provision for Depreciation Account
7. Dr. Suspense Account   ₦500,000
   Cr. Cash Book   ₦500,000
8. Dr. Suspense Account   ₦90,000
   Cr. Purchases Account   ₦90,000
9. Dr. Partners' Capital Account; Cr. Assets Account
10. Dr. Realization Account; Cr. Assets Account
11. Dr. Realization CR Expenses Account
12. ₦332,000
13. ₦4,000
14. FIFO
15. ₦1,200
16. Window Dressing/Creative Accounting
17. Cost of goods sold ÷ (Opening inventory + closing inventory ÷ 2) or cost of sales/sales
18. Dr. Application and Allotment Account
    Cr. Cash Account
19. Increase profit
20. Sequential coding and block coding

Workings
Q12

Subscriptions Account

	₦		₦
Balance b/d	50,000	Balance b/d	32,000
Income & Exp	332,000	Receipts & Payments	354,000
Balance c/d	14,000	Balance c/d	10,000
	396,000		396,000
Balance b/d	10,000	Balance b/d	14,000

13) ₦354,000 − (₦40,000 + ₦310,000) = ₦4,000
15) Use principles of Lower of cost and net realizable value
    [₦120+₦180+₦450+₦255+₦195] = ₦1,200

Examiner's comments

All the candidates attempted the questions and majority of them performed well. About 60% of the candidates scored above 50% of the marks obtainable. The commonest pitfall was the inability of the candidates to cover the whole syllabus.

SECTION B:

SOLUTION 1

a. **Purposes of conceptual framework of financial reporting**
   1. Assisting users of financial statements in interpreting the information contained in financial statements prepared in conformity with International Accounting standards. (IAS).
   2. Assist auditors in forming opinion as to whether financial statements conform with IAS.
   3. Assists national standard setting bodies in developing national standards
   4. Provides those who are interested in the work of IASB with information about its approach to the formulation of International Accounting Standards
   5. Assist the preparers of financial statements in applying IAS and in dealing with topics that are yet to form the subject of an IAS.
   6. Assist the International Accounting Standards Board (IASB) in the development of future IAS and in its review of existing ones.
   7. Promote consistency across standards, enhancing comparability between entities.
   8. Support Global Harmonisation by enabling financial statements to be comparable internationally.

b. **Fundamental qualitative characteristics of financial information**

   Relevance

   Information must be relevant to the decision-making needs of the users. Information is relevant if it can be used for predictive and /or confirmatory purposes.

   It has predictive value, if it helps users to predict what might happen in the future

   It has confirmatory value if it helps users to confirm the assessment and predictions they have made in the past.

   The relevance of information is affected by its materiality. Information is material if omitting it or misstating it could influence decisions that users make on the basis of financial information about a specific reporting entity.

20

Materiality is an entity - specific aspect of relevance based on the nature or magnitude (or both) of the items to which the information relates in the context of an individual entity`s financial report.

Therefore, it is not possible for the IASB to specify a uniform quantitative threshold for materiality or predetermine what should be material in a particular situation.

Faithful representation

Financial reports represent economic phenomena (economic resources, claims against the reporting entity and effects of transactions and other events and conditions that change those resources and claims) by depicting them in words and numbers.

To be useful financial information must not only represent phenomena, but it must also faithfully represent phenomena that it purports to represent.

A perfectly faithful representation would have three characteristics. It would be:

Complete - the depiction includes all information necessary for a user to understand the phenomena being depicted, including all necessary descriptions and explanations.

Neutral - the depiction is without bias in the selection

Or presentation of financial information; and

Free from error - where there are no errors or omissions in the description of the phenomena, and the process used to produce the reported information has been selected and applied with no errors in the process.

Examiner's comments

The question tested the purposes of the conceptual framework for financial reporting and fundamental quantitative characteristics of financial information.

Above 80% of the candidates attempted the question but the performance was not that good as about 50% scored below average mark allocated to the question.

The commonest pitfall was the inability of the candidates to differentiate between fundamental and enhancing characteristics of financial information.

SOLUTION 2

<div align="center">

JEKINJE POLITICAL ASSOCIATION
STATEMENT OF INCOME AND EXPENDITURE ACCOUNTS FOR THE YEAR ENDED
DECEMBER 31, 2021

</div>

Income	*NOTES*	₦'m	₦'m
Subscription	2		760
Gain on investment disposal	4		250
Interest Income	4		35
Total Income			1,045
Expenditure			
Depreciation - Furniture and fittings	7	39	
Loss on sales of magazine	8	45	
Agent salaries (700- 50)		650	
Office salaries		350	
Rent and rate (170 -50)		120	
Meeting and propaganda (165 - 30)		135	
Stationery		150	
Interest on overdraft		15	
Total Expenditure			(1,504)
Deficit			(459)

<div align="center">

JEKINJE POLITICAL ASSOCIATION

</div>

Statement of Financial Position as at December 31, 2021

Non-Current Assets	*NOTES*	₦m
Office Premises	5	1,675
Furniture and fittings	7	351
Investment Account	3	1,200
Total non-current assets		3,226
Current Assets		
Prepaid salaries		50
Meetings propaganda prepaid		30
Total Current Assets		80
		3,306
Funds		
Accumulated Fund b/f	11	2,580
Deficit for the year		(459)
Accumulated Fund c/f		2,121
General Funds	9	520
Revaluation Reserve		200
Election Funds	10	145
Total Funds		2,986

Liabilities

Owings for NCA	6	220
Bank Overdraft	1	50
Subscription in advance	2	50
Total Liabilities		320
Total Equities and Liabilities		3,306

Working Notes

1 BANK ACCOUNT

	N'm		N'm
Bal b/f	470	Office premises	1,525
Subscription	835	Office furniture	170
Investment disposal	1,250	Cost of making	120
Interest Income	35	Agent salaries	700
Sales of magazine	75	Office salaries	350
Donation – Gen Fu	520	Rent and Rate	170
Don – Election Fu	850	Election expense	720
		Meeting and prop.	165
		Stationery	150
		Interest on overdraft	15
Bal c/f	50		
	4,085		4,085
		Bal b/f	50

2 SUBSCRIPTION ACCOUNT

	N'm		N'm
Bal b/f	25	Bank	835
Income and expend	760		
Bal c/f	50		
	835		835

3 INVESTMENT ACCOUNT

	N'm		N'm
Bal b/f	2,000	Disposal	1,000
Revaluation Reserve	200	Bal c/f	1,200
	2,200		2,200
Bal b/f	1,200		

4 INVESTMENT DISPOSAL ACCOUNT

	N'm		N'm
Investment	1,000	Bank	1,250
Income and expend	250		
	1,250		1,250
Interest income			35

5   OFFICE PREMISES

	₦'m		₦'m
Bank	1,525		
Owings	150	Bal c/f	1,675
	1,675		1,675
Bal b/f	1,675		

6   OWINGS

	₦'m		₦'m
		Office premises	150
Bal c/f	220	Office furniture	70
	220		220
		Bal b/f	220

7   OFFICE FURNITURE

	₦'m		₦'m
Bal b/f	150		
Bank	170	Bal c/f	390
Owings	70		
	390		390
Bal b/f	390		
Depreciation			39

Net Book Value (NBV) = 390 − 39 = 351

8   CLUB MAGAZINE TRADING ACCOUNT

	₦'m
Sales of magazine	75
Cost of sales	(60)
Gross profit	15
Cost of magazine given away	(60
	45

9   GENERAL FUND

	₦'m		₦'m
Bank	520	Bank	520
	520		520
		Bal b/f	520

10   ELECTION FUND

	₦'m		₦'m
Bank	720	Bal c/f	15
Bal c/f	145	Bank	850
	865		865
		Bal b/f	145

Assets		₦'m
Bank		470
Subscription in arrears		25
Investment		2,000
Office furniture		150
Total Assets		2,645
Liabilities		
Rent and rate owings	50	
Election Fund	15	
Total Liabilities		65
Accumulated Funds		2,580

Examiner's comments

The question was on not-for-profit organization. Many candidates did not attempt the question and the performance of those that attempted it was not good. About 90% of them scored below average mark. The commonest pitfall was the treatment of gains on investment and revaluation of investment. They could not differentiate between profit already earned and the one not yet earned.

SOLUTION 3

KRAPEH LTD
STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME FOR THE YEAR ENDED AUGUST 31, 2022

	GHc'000	GHc'000
Revenue		61,970
Cost of Sales		
Cost of sales		(27,248)
Gross Profit		_34,722_
Other Income		
Gain on sales of motor vehicle		843
Total Income		35,565
Expenses		
Administrative expenses	8,774	
Total operating expense		(8,774)
Operating Profit		_26,791_
Finance cost		-
Profit before tax		26,791
Income Tax		(6,940)
Profit for the year		_19,851_
Other Comprehensive Income		
Revaluation Gain on property		3,845
Total Comprehensive Income		_23,696_

KRAPETH LIMITED
STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED AUGUST 31, 2022

	Ordinary Shares GHc'000	Share Premium GHc'000	Revaluation Reserve GHc'000	Retained Earnings GHc'000	General Reserve GHc'000	Total GHc'000
Balance b/f	18,000		6,894	12,344	3,142	40,380
TCI for the year	-	-	3,845	19,851	-	23,696
Issue of shares	3,000	4,500	-	-	-	7,500
Dividend Preference	-	-	-	(1,100)		(1,100)
Dividend Ordinary	-	-	-	(3,200)		(3,200)
Ordinary Transfer	-	-	-	(1,149)	1,149	-
Balance c/f	21,000	4,500	10,739	26,746	4,291	67,276

WORKING NOTES
1. Issue of Shares

Number of shares issued (000)		6,000
Par Value	×	0.50
Ordinary Shared Issues (GHc'000)		3,000
Share Premium (Balancing figure)		4,500
Total amount received		7,500

Examiner's comments

The question tested candidates understanding of preparation of statement of profit or loss and other comprehensive income together with statement of changes in equity.

Many candidates attempted the question, and performance was good as about 70% of them scored above 50% pass mark. The major pitfall was on the preparation of statement of changes in equity. Most of the candidates did not know which item to be treated under other comprehensive income and those to be treated under statement of changes in equity.

SOLUTION 4

a)   Ethics is important to professional accountants for the following reasons:

   1.   Professional accountants are faced with ethical pressures and influences from companies, management, employees, government and general public. They

need ethical regulations, to guide them, to handle such pressures, professionally.

2. Existing and potential shareholders need financial reports to make informed decisions. Professional accountants owe obligation to them, to ensure that financial information represents true and fair view of transactions and events.

3. Accountants handle confidential information of their clients, employers and employees. They need to follow best ethical practices in managing such confidential information.

4. Adhering to ethical behaviour, in the course of their duty may protect the professional accountant from legal damages.

5. Ethics ensure that accountants adhere to laws, regulations, and professional standards, avoiding penalties for non-compliance.

6. Ethical practices promote sustainable business decisions helping companies maintain long-term growth and stability.

b) The following fundamental principles are set out in the Professional Code of Ethics to guide professional accountants, in the performance of their duties:

i) Integrity Professional accountants should be honest and straightforward in their professional and business dealings. They must be seen to be honest. Integrity implies not just honesty but also fair dealings and truthfulness;

ii) Objectivity members should not allow bias, conflicts of interest or undue influence of others to override their professional or business judgments;

iii) Professional competence and due care Members have a duty to maintain their professional knowledge and skills at such a level that a client or employer receives a competent service, based on current developments in practice, legislation and techniques. They should act diligently and in accordance with applicable technical and professional standards;

iv) Professional behaviour Members must comply with relevant laws and regulations, always behave with courtesy and should avoid any action which can put the profession to disrepute; and

v) Confidentiality Members should not disclose any information of their clients or employers to third parties without the consent of such or unless there is a legal or professional right or duty to disclose. Confidential information acquired as a result of professional and business relationships should not be used for the personal advantage of members or third parties.

vi) Accountants should exercise care and thoroughness in preparing financial reports, ensuring all data is accurate and compliant with financial legislation.

vii) Accountants should take responsibility for their actions and decisions, ensuring

they uphold ethical principles even when under pressure from clients or employers.

Examiner's comments

The question tested candidates' knowledge and understanding the importance of ethics of professional accountants.

The question was attempted by about 80% of the candidates being a theory and the performance was good as about 60% of them scored above the pass mark.

The A part of the question was the problem of the candidates as some of them did not know the importance of Ethics to Professional Accountants.

SOLUTION 5

Sec 3 Horizon Ventures

EXTENDED TRIAL BALANCE OF HORIZON VENTURES AS AT 30 JUNE 2021

	Opening Trial Balance		Adjustment		Final Trial Balance	
	DR	CR	DR	CR	DR	CR
Inventory	122,580				122,580	
Sales		979,200				979,200
Purchases	641,120				641,120	
Salaries & Wages	199,850				199,850	
Motor Vehicles	258,750				258,750	
Furn. & Fittings	111,240				111,240	
Insurance	49,590				49,590	
Electricity Exp	24,140		(i) 3,110		27,250	
Trade Receivable	201,600				201,600	
Payables		89,600				89,600
Cash & Bank	87,030				87.030	
Capital		627,100				627,100
Accrued Electricity				(i)3,110		3,110
Depr. Account MV			(ii)51,750		51,750	
Prov. for Depr. MV				(ii)51,750		51,750
Depr. Acc. Fur & Ft			(iii)11,124		11,124	
Prov. for Dep. F&F				(iii)11,124		11,124
Bad & Doubtful Debt			(iv)5,040		5040	
Prov. for Bad & DD				(iv)5,040		5040
	1,695,900	1,695,900	71,024	71,024	1,766,924	1,766,924

Examiner's comments

The question was on Extended Trial balance. It was well attempted but only about 50% of them scored above the pass mark. The commonest pitfall was on the adjustments part of the trial balance while they got the opening trial balance, the non-understanding of the adjustments made them not to get the final trial balance correctly.

SOLUTION 6
a)   Optimist Limited

		DR ₦	CR ₦
I.	Bank Account	350,000	
	Application and Allotment Accounts		350,000
	Being application money received for 1,000,000 ordinary shares		
II.	Application and Allotment Account	350,000	
	Ordinary Share Capital		350,000
	Being application money transferred to ordinary share capital Account		
III.	Application and Allotment Account	650,000	
	Ordinary Share capital Account		250,000
	Share Premium Account		400,000
	Being allotment of 1,000,0000 shares		
IV.	Bank Account	650,000	
	Application and Allotment		650,000
	Being amount received on allotment of 1,000,000		
V.	First Call	400,000	
	Ordinary Share Capital		400,000
	Being amount called up on 1,000,000 shares		
VI.	Bank Account	360,000	
	Call in arrears account	40,000	
	First call account		400,000
	Being amount received on first call and amount of default		
VII.	Ordinary Share Capital A/c	100,000	
	To: Call in arrears		40,000
	To: Forfeited Share Account		60,000
	Being double entry on forfeited share		
VIII	Bank Account	75,000	
	To: Forfeited share account		75,000
	Being double entry on cash received on share reissue		
IX.	Forfeited Shares Account	100,000	
	Share Capital Account		100,000
	Being re-issue of shares earlier forfeited		
X.	Forfeited share account (60,000+75,000-100,000) To: Share Premium Account	35,000	35,000
	Being Gain on share forfeited and reissue		

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b)   **Uses of share premium account**
The share premium can be used for the following:
1. Pay the expenses of using equity, such as underwriter fees
2. Issue bonus shares to shareholder
3. It may be distributed to shareholders
4. It may be used to buy bulk shares
5. Capital Restructuring
6. Covering premium on Redemption of Debentures
7. Redemption of preference shares

Examiner's comments

The question tested issue of shares and raising of journals. Only few of the candidates attempted the question and those that attempted did not perform well. The major problem with the candidates was raising journal and giving correct narrations. They could not determine the accounts to be debited and those to be credited.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

ABWA
The Association of Accountancy
Bodies in West Africa
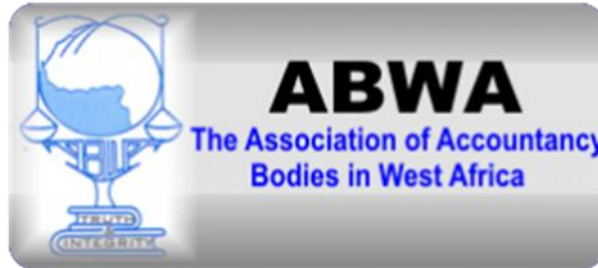
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA SEPTEMBER 2024 EXAMINATIONS (PART II)

PUBLIC SECTOR ACCOUNTING

PLEASE READ THESE INSTRUCTIONS BEFORE COMMENCEMENT OF PAPER

EXAMINATION INSTRUCTIONS

1.   All solutions should be in ink. Any solution in pencil will not be marked.

2.   Read all instructions on each part of the paper carefully before answering the questions.

3.   Ensure that you do not answer more than the number of questions required for **Section B (The Essay Section).**

4.   Check your pockets, purse and mathematical sets box to ensure that you do not have any cell phone or written material with you in the hall, otherwise, you will be stopped from continuing with the examination.

5.   Do not enter the hall with anything written on your docket.

6.   Insert your examination number in the space provided above.

WEDNESDAY, SEPTEMBER 25, 2024

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
PART II EXAMINATIONS – SEPTEMBER 2024

PUBLIC SECTOR ACCOUNTING
Time Allowed: 3 hours

SECTION A: PART I   MULTIPLE-CHOICE QUESTIONS   (30 MARKS)

ATTEMPT ALL QUESTIONS IN THIS SECTION

Write ONLY the alphabet (A, B, C, D or E) that corresponds to the correct option in each of the following questions/statements.

1. Which of the following is **NOT** an advantage of line-item budgeting method?

   A. It is simple to understand and operate
   B. It is cheaper to produce
   C. It suits the country's level of development, where there is paucity of data
   D. It encourages the continuity of projects
   E. The method allows past errors to be carried forward

2. Which of the following is **NOT** recurrent expenditure?

   A. Running cost
   B. Salaries and allowances
   C. Road construction cost
   D. Electricity charges
   E. Pension and gratuity

3. Which of the following is a means of control exercised by the Legislature?

   A. Preparation of the Financial Statements of the government
   B. Determination of monetary fiscal policies in general
   C. Summoning the President to explain details of the Budget
   D. Issuance of budgetary guidelines
   E. Introduction of due-process guidelines

4. Which of the following is **NOT** a member of Federation Account Allocation Committee?

   A. Honorable Minister of Finance
   B. State Commissioner of Finance
   C. Accountant General of the Federation
   D. State Accountant Generals
   E. Auditor General for the Federation

5. Which of the following is **NOT** a non-tax revenue?

    A. Wireless communications (licensing fees)
    B. Geological survey (fees for services)
    C. Personal Income Tax
    D. Back-duty investigation (fines/penalties)
    E. Trademarks (registration fees)

6. Which of the following is part of the National Chart of Accounts structure for budgeting?

    A. Geographical segment
    B. Sectional segment
    C. Public sector segment
    D. Overseas account segment
    E. Private sector segment

7. The Auditor makes a report about the financial statements and underlying records to the following external users, EXCEPT

    A. General public
    B. Labour union
    C. Legislative
    D. Suppliers and contractors
    E. Foreign financial institutions

8. Which of the following is NOT a punishment by the code of conduct and tribunal on any public officer guilty of the provisions of the Code of Conduct Act?

    A. Vacation of office seat for a junior officer in the Ministry
    B. Prosecution of the Public Officer in a court of law
    C. Disqualification from membership of a legislative house
    D. Seizure and forfeiture of property acquired through the corruption to the state
    E. Serve penalties imposed by law where the conduct is a criminal offence

9. Where there is suspicion of irregularities within an organisation/entity, ------------- --- is carried out with a view of obtaining evidence that could be used to support.

    A. Internal audit
    B. Compliance audit
    C. Forensic audit
    D. Management audit
    E. Effectiveness audit

10. Which of the following agencies or arm of the Federal Government of Nigeria are exempted from the publication on the Transparency and Open Treasury Portal of GIFMIS

    A. Executive
    B. The legislature
    C. The judiciary
    D. Ministries, department and agencies
    E. Non-Governmental organisation

11. The Chairman of the Financial Reporting Council of Nigeria shall be a/an ------------ ----- with a considerable professional experience

    A. Medical doctor
    B. Lawyer
    C. Surveyor
    D. Accountant
    E. Director

12. Which of the following tiers of government funds the Fiscal Responsibility?

    A. The National Assembly
    B. The Federal Executive Council
    C. The State Government
    D. The Federal Government
    E. The Local Government

13. Which of the following is **NOT** recognised as a source of revenue to local government?

    A. Tenement rates
    B. Motor Park levies
    C. Election form fees
    D. Cattle tax
    E. Market taxes

14. Which of the following is **NOT** expected to receive the report of Board of Enquiry?

    A. Auditor – General for the Federation
    B. Permanent Secretary
    C. Accountant – General of the Federation
    D. Secretary, Federal Public Service Commission
    E. Attorney – General of the Federation

15. Which of the followings is a charge from Consolidated Revenue Funds?

    A. External Capital Grants
    B. Internally Generated Revenue
    C. Direct Taxes
    D. Salaries and Consolidated Allowances of Chief Justice and Justices of the Supreme Court
    E. Vat Payment

16. Which of the following is **NOT** one of the items under operating activities in the preparation of cash flow statements?

    A. Cash receipt from Statutory allocation /Federation accounts
    B. Cash Payments to and on behalf of employees
    C. Cash receipts from royalties, fees, commissions and other revenues
    D. Cash Payments to Suppliers of goods and Services
    E. Cash repayment of amount borrowed

17. Which of the following is **NOT** a public sector entity?

    A. Local Government
    B. Federal Government
    C. University of Lagos
    D. Red Cross Society of Nigeria
    E. State Government

18. Which of the following is **NOT** one of the functions the State Board of Inland Revenue perform?

    A. Ensuring the effectiveness and optimum collection of all taxes and penalties due to the government under the relevant laws
    B. Preparation of financial statements for taxpayers
    C. Appointing, promoting, transferring, and imposing discipline on employees of the state service
    D. Making recommendations, where appropriate, to the Joint Tax Board on tax reform, tax Registration, Tax treaties and exemptions as may be required from time to time
    E. Generally controlling the management of the State Service on policy matters subject to the provision of the law setting up the State Service

19. According to the Pension Reform Act 2014 (as amended), what is the pension rate contribution between the employee and employer?

    A. Employee is expected to contribute a minimum of 10% and Employer is expected to contribute a minimum of 9%
    B. Employer is expected to contribute a minimum of 8% and Employee is expected to contribute a minimum of 10%
    C. Employee is expected to contribute a minimum of 8% and Employer is expected to contribute a minimum of 10%
    D. Employee is expected to contribute a minimum of 8% and Employer is expected to contribute a minimum of 8%
    E. Employee is expected to contribute a minimum of 7.5% and Employer is expected to contribute a minimum of 7.5%

20. The Pension Funds Administrators are expected to keep and manage on behalf of employee

    A. Retirement Savings Account
    B. Retirement Single Account
    C. Retirement Simple Account
    D. Retiree Savings Account
    E. Retirement Systems Account

21. In accordance with the financial regulations, the Chief Accounting Officer of the Receipts and Payments of the Federal Republic of Nigeria is

    A. The Auditor-General for the Federation
    B. The President
    C. The Minister of Finance
    D. The Accountant-General of the Federation
    E. The Governor of the Central Bank

22. The International Public Sector Accounting Standard (IPSAS) which deals with the Presentation of Cash Flow Statement is

    A. IPSAS 1
    B. IPSAS 2
    C. IPSAS 3
    D. IPSAS 4
    E. IPSAS 5

23. The public fund provided for unbudgeted expenditure is called

    A. Contingency Reserve Fund
    B. Contingency Fund
    C. Capital Project Fund
    D. Trust and Agency Fund
    E. General Fund

24. The officer that performs a similar role to that of the Accountant-General of the Federation at the Local Government level is

    A. Accountant-General of the Local Government
    B. Vote Controller
    C. Treasurer
    D. Revenue Collector
    E. Imprest Holder

25. Which of the following is **NOT** a public sector organisation?

    A. Federal government
    B. State government
    C. National Agency for Food and Drug Administration and Control
    D. Nigeria Theological Seminary and Chaplaincy
    E. Nigerian Civil Aviation Authority

26. Which of the following is **NOT** an advantage of accrual basis?

   A. It is simple and easy to understand
   B. It takes a realistic view of financial transactions
   C. It reveals an accurate picture of the state of financial affairs at the end of the period
   D. It could be used for both economic and investment decision-making
   E. It aligns with the matching concept

27. Which of the following is **NOT** a member of the executive arm of government?

   A. Minister
   B. Local Government Chairman
   C. State Governor
   D. Senate President
   E. The President of Nigeria

28. Which of the following is **NOT** true of International Public Sector Accounting Standard Board (IPSASB)

   A. IPSASB recognises the right of governments and national standard-setters to establish accounting standards and guidelines for financial reporting jurisdictions
   B. The Board encourages the adoption of IPSASs and the harmonisation of national requirements with IPSASs
   C. The IPSASB was formerly called Public Sector Committee
   D. The members of IPSASB are appointed by IFAC
   E. Observers in the Board have all the privileges of the floor including voting right

29. Financial statements should be described as complying with IPSASs only if

   A. They comply with all requirements of each applicable IPSAS
   B. It reveals an accurate picture of the state of financial affairs at the end of the period
   C. It could be used for both economic and investment decision-making
   D. A separate payment tabulation is available when required
   E. It makes allowance for the diminution in the value of assets employed to generate revenue

30. The Act that regulates payment or withdrawal from the Consolidated Revenue Fund is the

   A. Fiscal Responsibility Act, 2007
   B. Public Procurement Act, 2007
   C. The Financial Regulations (2009 Edition)
   D. Annual/ Supplementary Appropriation Act
   E. Finance and Treasury Circulars

SECTION A: PART II   **SHORT-ANSWER QUESTIONS**   **(20 MARKS)**

ATTEMPT ALL QUESTIONS

Write the correct answer that best completes each of the following questions/statements

1. A document used by Government to effect transfer from one account to another without the movement of cash is.............................

2. An expenditure whose benefits accrue for more than one year is known as ....

3. A financial statement prepared by the government to meet extra expenditure not originally proposed or budgeted for is known as............................

4. The excess of incomes over expenditures is referred to as ....

5. Sources and application of fund is now known as................. under the International Public Sector Accounting Standard.

6. The specific conventions, basis, principles, etc. operated by a public sector organisation is called ....

7. The document which evidences a payment or receipt of government money is called ....

8. The form that would be sent to all Ministries and Department heads for confirmation that an officer is still in service at the beginning of a current year is called .... Form.

9. A committee of parliament responsible for the receipt of the Appropriation Bill for the consideration of the National Assembly is called...............................

10. IPSAS 24 requires a comparison of two types of amounts or figures arising from execution of the budget to be included in the financial statements of reporting entities. They are .... and .... amounts or figures.

11. The procedure by which fund is transferred from one sub head to another within the same Head of Expenditure is known as ....

12. A Ministry or Extra-Ministerial Department which has no control whatsoever over any of its accounting and financial records is referred to as ....

13. The independent appraisal process often governed by statute for examining, investigating, and verifying the financial statement of an organisation by a person duly appointed is called ....

14. The report prepared and presented to departmental management for review and commentary after completion of audit work is known as -----------------------

15. Where an officer fails to give satisfactory reply for his failure to account for Government revenue and an audit query is issued, he has--------------- days to

respond to the query.

16. The Chairman of ICPC, according to corrupt practices and other related offences Act 2000 is required to hold office for a maximum of---------------years aggregate on re-election.

17. The body established with the responsibility of investigating and enforcement of all laws against all financial crimes in all its ramification is known as ------------------------

18. Financial reporting standards for application by public sector entities other than Government Business Enterprises (GBEs) are known as..............

19. The process that is concerned with the receipt, custody, disbursement and rendering of stewardship on public funds entrusted to government office holders is called..........

20. Broad basic assumptions underlying the preparation of financial statements of an enterprise are generally referred to as ....

SECTION B: ATTEMPT ANY FOUR QUESTIONS   (50 MARKS)

QUESTION 1

a.   IBIS is a Local Government with a population of 10 million citizens comprising of the following:

    i.   6 million are taxable adults who are expected to pay tax at the rate of ₦500 per person.

    ii.   The government also has the expectation of generating more revenue from transportation and therefore invested heavily in 5000 mass transit buses each of which is expected to generate ₦4,000 per business day.

    iii. Industries that are expected to pay land use charge of ₦30,000 per industry are 450 in number. While there are 4,500 residential buildings expected to pay land use charge of ₦15,000 per house per annum.

    iv.   It also has 10,000 market stalls rented to traders at ₦80,000 per annum per stall.

    v.   The modern markets has 6000 hawkers who will pay entrance fee to the market on daily basis at the rate of ₦50 per day.

    vi.   The local government expects the following additional revenue in the year:

| Statutory allocation | ₦45,000,000 |
| Miscellaneous Revenue | ₦5,000,000 |

Required:
With the assumption that there are 28 days in a month and 12 months in a year, compute the revenue budget of the local government for the year 2023. (Show your workings)   (8½ Marks)

b. Briefly discus **FOUR** factors that militate against the efficient and effective budgeting system in the public sector in Nigeria. (4 Marks)
(Total 12½ Marks)

QUESTION 2

At the State level, the Personal Income Tax Act 1993 established the State Board of Internal Revenue Services **(SBIRS)**

a. **Required:**

State and explain **FOUR** of the responsibilities of the State Board of Internal Revenue Services. (8 Marks)

b. List **THREE** Revenues, Federal Inland Revenue Services collect on behalf of the Federal Government. (4½ Marks)
(Total 12½ Marks)

QUESTION 3

Inventory Management is essential and vital for safe keeping of stores items and to avert loss, the Ministries, Extra-Ministerial Department and Agencies must institute strong control procedures.

You are required to explain:

a. Allocated and Unallocated Stores (3½ Marks)
b. Three Sub-division of unallocated Stores (1½ Marks)
c. Inventory Management in Public Sector Accounting (2½ Marks)
d. Stores Receipt Voucher and Stores Issue Voucher (1 Mark)
e. Highlight **FOUR** inventory valuation methods that should not be used in the preparation of Financial Reports recommended in IAS 2 – Inventories. (1 Mark)
f. Dikwa Local Government provides you with the year – end 31st December 2020 an inventory amounted to ₦956,500 value at cost, included in the amount is some Furniture and Fitting which had been damaged by terrorists. The cost of the damaged inventory was stated at ₦558,000. The Local Government wishes to sell the Furniture and Fitting to the public for the sum of ₦350,000 and is expected to incurred incidental cost of ₦80,000

You are required:

As the Treasurer of Dikwa Local Government; estimate the inventory closing value and journalised the transactions (3 Marks)
(Total 12½ Marks)

QUESTION 4

On 4th July 2018, the Federal Executive Council approved the Transparency Policy which is designed in accordance with the anti-corruption posture of the Federal Government and in line with the freedom of Information Act 2014. In furtherance to the implementation of this policy, on 9th December 2019, Mr President inaugurated the Federal Government Transparency Guidelines and Open Treasury Portal Policy.

Required to:

What is the Transparency Portal? (½ Mark)

b.   List the purpose of publication on the open Treasury portal (2½ Marks)

c.   Who is exempted from this publication? (2½ Marks)

d.   State the SEVEN reports approved by the Federal Executive Council that must be on this Portal (7 Marks)

(Total 12½ Marks)

QUESTION 5

a.   Explain the following terms under the Pension Reform Act 2014 (as amended):

   i.   Programmed Withdrawal (2 Marks)
   ii.   Retiree Life Annuity (3 Marks)

b.   Dr. Emeka Osinnaike who recently retired from the University College Hospital, Ibadan, wishes to re-invest his savings accounts balance with Mays Assurance Ltd on Retiree Life Annuity for the first 10 years of Expected lifetime from the year 2021.

The detailed of the project is as follows:

(i)   The initial cash investment is ₦10,000,000.00
(ii)   Expected monthly cash-inflow of ₦200,000 in the first 5 years
(iii)   Expected monthly cash-inflow of ₦300,000 in the next 6-10 years
(iv)   The Discounting Rate is 20%.

   You are required to compute:

   i.   The Net Present Value (NPV) (7 Marks)
   ii.   Comment on the above computed project (½ Mark)

(Total 12½ Marks)

QUESTION 6

a.   Budget is normally prepared for a period of one year and one of the primary objectives of budget is to measure the profit of an organisation. However, in the case of government entities, budgets are prepared for several reasons.

Required:

You are therefore required to state **FIVE** uses of government Budget. (5 Marks)

b.   The budget office of the Federation is saddled with the responsibilities of preparing the annual estimates and the formulation of the fiscal, monetary and other policies, which are needed to support the economy.

Required:

List **FIVE** functions that are performed by this office. (7½ Marks)

(Total 12½ Marks)

SECTION A: PART I

MULTIPLE-CHOICE SOLUTIONS

1. E
2. C
3. C
4. E
5. C
6. A
7. B
8. A
9. C
10. E
11. D
12. D
13. C
14. D or E
15. D
16. E
17. D
18. B
19. C
20. A
21. D
22. B
23. B
24. C
25. D
26. A
27. D
28. E
29. A
30. D

Examiner's comment

This is a compulsory 30 marks multi-choice question that covers every segment of the entire syllabus. Candidates are expected to write only the alphabet that corresponds to the correct option in each of the questions/statements.

All the Candidates attempted the questions, but performance was good. As about 80% of the candidates scored above 50% of total marks obtainable.

The commonest pitfall was the inability of the candidates to cover every area of the syllabus.

Candidates are advised to have a sound knowledge of Public Sector Accounting by making use of the Institute's Study Text and also practice with previous diets' examination questions.

SECTION A: PART II

SHORT-ANSWER SOLUTIONS

1. Adjustment Voucher/Journal
2. Capital or Development Expenditure
3. Supplementary Warrant or Estimate or Budget
4. Surplus Budget
5. Cash Flow
6. Accounting Policies
7. Voucher
8. Personal Emolument Form
9. Public Finance Committee
10. Budgeted and Actual
11. Virement
12. Non-Self Accounting Unit
13. Auditing
14. Management Report
15. 7 Days
16. 10 Years
17. EFCC
18. International Public Sector Accounting Standards (IPSASs)
19. Public Sector Accounting
20. Concepts

Examiner's Comments

This is a compulsory 20 marks short-answer questions which covers all areas of the syllabus. Candidates are expected to write the correct answer that best completes each of the questions/statements.

All the candidates attempted the questions, but the performance was average as about 45% of the candidates scored above 50% of total marks obtainable. The commonest pitfall was lack of adequate preparation by the candidates for the examination and their inability to cover areas of the syllabus.

Candidates are advised to make adequate use of the Institute's Study Text and the Past questions of the previous diets' examination questions.

SECTION B:

SOLUTION 1

a. IBIS Local Government
   Revenue budget for the year 2011

Details	Amount N'000	Amount N'000
Statutory allocation		45,000
Income tax (W i.)		3,000,000
Land use charges (Industrial building) (W. iii)		13,500
Land use charges (Residential building) (W. iii)		67,500
Stalls revenue (W. iv)		800,000
Revenue from hawkers (W. v)		100,800
Revenue from Mass Transit Buses (W. ii)		6,720,000
Miscellaneous Revenue		5,000
Total revenue		**10,751,800**

Workings		N'000
i. Income Tax	(6,000,000 x 500)	3,000,000
ii. Revenue from Mass Transit Buses	(5,000x28x12 x N4,000)	6,720,000
iii. Land Use Charges (Industrial Building)	(N30,000 x 450)	13,500
Land use Charges (Residential Buildings)	(4,500 x N15,000)	67,500
iv. Market Stalls Revenue	(10,000 x N80,000)	800,000
v. Revenue from Hawkers	(N50 x 28 x 12 x 6,000)	100,800

1b. Factors, which militate against the budgeting system in the public sector in Nigeria

The key factors, which militate against efficient and effective budget implementation in the public sector are as follows:

a) **Human element**
   Top management members see budgeting as restraining and challenging. They tend to develop a lot of apathy towards its adoption and implementation. The lack of probity and accountability of some operatives affect successful budgeting.

b) **Uncertainties underlying data inputs**
   There are a lot of uncertainties in the data used for the budget preparation. The projections in revenue accruing from oil may not be forthcoming in view of the vagaries in the world market. Lack of efficient database also hamstrings reliable forecasts.

c) **The type of project for which budget is prepared**
   How successful a budget will be depends on the type of project to which it relates. Some projects are popular while others are not. Those which are not popular may face stiff implementation problems.

d) **The problem of inflation**
   Inflation tends to reduce the purchasing power. When the value of money is falling, budget implementation may run into problems. The revenue available will not be able to cover the expenditure.

e) **Political, social and cultural elements**
   Each segment of the nation has its own cultural beliefs and taboos, which may take time to change. Introducing innovation may be met with stiff opposition. For example, a section of the country may not be willing to provide land for development purposes. Secondly, where there is political instability, budget implementation is at risk.

f) **Changing government policies**
   To implement a budget, a lot depends on the policy of government. For effective budget implementation, government policies have to be harmonised and consistent. Frequent changes of government policies affect budget implementation.

g) **The problem of debt management and optimal use of limited resources.**
   There is the challenge of striking a balance between which parts of the nation's resources should be used for servicing debts and the amount that should be utilised for economic development.

h) **Low agricultural output.**
   Agricultural output is fast dwindling because the method of farming is outdated, and the younger population is not attracted. The resources that should be used for economic development are therefore being diverted to the importation of food items.

i) **Fiscal indiscipline.**
   Most government officers are always maximising their budget. Under the incremental budgeting system, they tend to expend the last naira available in a year's budget in order to justify the demand for increase allocation in the subsequent year, with little or nothing to show as a proof of what has happened in the current year.

Examiner's comments

The question tests candidates' knowledge and understanding of revenue budget of the local government. Candidates are expected to compute the revenue budget of the local government for the year and discuss factors that militate against the efficient and effective budgeting system in the Public Sector.

About 80% of the candidates attempted the question and about 55% of them scored 50% of total marks obtainable.

The commonest pitfall was the inability of some candidates to correctly compute the revenue budget.

Candidates are advised to have a sound knowledge of pure government account as it relates to revenue budget. Candidates should make adequate use of the institute's Study Text and past examination questions.

SOLUTION 2A

States Board of Inland Revenue Service has the power to and is responsible for:

a. Assessing, collecting and accounting for all taxes, fees, and levies in the State. The Commissioner of Finance is to prescribe the manner the Board is to account for the taxes, fees and levies collected;

b. Supervising the collection of all revenues due to the State Government with other ministries, extra Ministerial Department, Parastatals and government companies;

c. Revising all obsolete rates collectable by the Board and initiate review and advise the governor on it;

d. Liaising on tax and revenue matters with the Federal governments directly through the Joint Tax Board and make recommendations where appropriate to the Joint Tax Board on Tax policy, tax reform, tax registration, tax treaties and exemption as may be required from time to time;

e. Administering the provisions of the Personal Income Tax Act 1993 as amended and relevant tax laws in the State; and

f. General control of the management of the service on matters of policy subject to the provisions of the edicts and imposing discipline on employees of the State Internal Revenue Service

SOLUTION 2B

Federal Inland Revenue Service (FIRS)

The FIRS is to control and administer the different taxes;

i.   Companies Income Tax
ii.   Hydrocarbon Tax
iii. Value Added Tax Act
iv.   Personal Income Tax in respect of, members of Nigeria Police Force, members of
v.   Armed Forces of Nigeria as well as staff of ministry of foreign affairs and non-residents; and

vi. Capital Gains Tax
vii. Stamp Duty Act in respect of residents of the Federal capital territory,

Examiner's Comment

The question tests candidates' knowledge and understanding of the State Board of Internal Revenue services and Federal Inland Revenue Services. Candidates are expected to state/explain the responsibilities of the State Board of Internal Revenue Service as well as revenue that the Federal Inland Revenue Services collect on behalf of the Federal Government.

About 80% of the candidates attempted the question. About 60% of them scored 50% of total marks obtainable.

The commonest pitfall was their inability to interpret the questions correctly with their failure to differentiate between the responsibilities of the State Board of Internal Revenue Services and that of the Federal Inland Revenue Services.

Candidates are strongly advised to ensure thorough understanding of requirements of questions before proffering solutions.

SOLUTION 3

a) Allocated and Unallocated Stores
   i. Allocated Stores:
      Definition:
      Allocated Stores are "those cost which are chargeable directly to, and remain a charge to, the sub-head of expenditure" in which funds for their purchase are provided in the Estimates or Budgets.

      Features of Allocated Stores
      These stores are taken on *numerical charge and may be placed in an allocated Stores or put into immediate use. They may be either *purchased direct or obtained from the unallocated Stores stocks.

   ii. Unallocated Stores
      Definition:
      Unallocated Stores are those purchased *for GENERAL STOCK rather than for a particular or specific work or service, for which the final vote of charge cannot be stated at the time of purchase.

      Features of Unallocated Stores
      1) The cost of items purchase is *DEBITED to an unallocated store sub-head in the Expenditure estimates.
      2) They are held on charge *by both value and unit and when issued for use are charged to the appropriate sub-head of expenditure as an Allocated Store.
      3) The corresponding *CREDIT is posted to the Unallocated Stores sub-head.

b) **Sub-Division or Types or Classes or Forms of Unallocated Stores:**
The Three sub-divisions or Types or Classes or Forms of unallocated stores are:
1) Expendable Stores
2) Non-Expendable Stores
3) Consumable stores

1) **Expendable Stores:**
These are stores of a* SEMI-PERMANENT or SEMI-DURABLE in nature.
Examples:
*Such as shovels, machetes, paint brushes, Broom, wheelbarrow, shovel and so on: which have SHORT PERIOD of serviceable or useful life.

2) **Non-Expendable Stores:**
*These are stores of a PERMANENT or DURABLE in nature.
Examples:
*Such as Furniture& Fitting, Typewriters, Motor Vehicles, Equipment's, Plant and Machinery, Computer and so on.
They are stores have LONG PERIOD of serviceable or useful life.

3) **Consumable Stores:**
*These are stores, which once used for the purpose for which they were acquired, cease to exist as a store's item.
Examples:
*Paint, Soap and Foodstuffs (Egg, Garri, Bean, Flour, Cow Meat, Vegetable Oil), Cream, Toothpaste and so on.

c) **Inventory Management in public sector accounting:**
Inventories Management in public sector accounting simply refer to all activities relating to inventory in the public sector. Inventories Management include procurement of inventory, storage, issuance, receipts of inventory, maintenance of inventory control levels etc.

d) i. **Stores Receipt Voucher**
*Stores Receipt Voucher is the voucher used to receive stock of stores into the store by the storekeeper.
*The voucher would be prepared in Triplicate.
Original Copy: will be forwarded to the Purchasing Department,
Duplicate Copy: will be forwarded to the Accounts Section and
Triplicate Copy: The other one retained by the Storekeeper.

ii. **Stores Issue Voucher**
Stores Issue Voucher is the voucher prepared when requisitions are made from stores.
The requisitions are prepared in Duplicates.
Original Copy: The original is forwarded to Stores Issuing Department.
Each line on the voucher must be utilized until the requisition is completely entered and there shall not be any blank spaces between items.
All amounts shall appear in words and in figures. The voucher shall then be ruled off and initialed.

Duplicate Copy: The issuing officer will sign each voucher booklet.

e) The FOUR (4) inventory valuation methods that should not be used for the preparation of Financial Reports are:
   i.   Latest Purchase Price (LPP)
   ii. Last-In-First-Out (LIFO)
   iii. Base Stock
   iv. Specific Identification
   v.   Standard price
   vi. Just In Time Method

f)

Dikwa Local Government
Inventory Valuation

For the Year Ended 31st December,2020	N	N
Inventory at Cost		*956,500
Damaged or Obsoleted at Cost	*558,000	
Less: Net Realisable Value *(350,000 – 80,000)	*270,000	
*288,000		
Written Down Value of Inventory at closing		*668,500

Journal Entries: *	Dr	Cr
Inventory	*668,500	
Cost of Sales		
*668,500		
Being the Value of Inventory as at 31/12/2020		

Examiner's comment

The question tests candidates' knowledge and understanding of the inventory management for safe keeping of stores in government Ministries, Department.

Candidates are required to explain allocated and unallocated stores, inventory management in Public Sector Accounting as well as inventory valuation method that should not be used in the preparation of the Financial Reports recommended in IAS 2- Inventories. The final part required Candidates to estimate the inventory closing value from a given transaction.

About 30% of the candidates attempted the question, while about 10% of them scored 50% of marks obtainable.

The commonest pitfall was the inability of some candidates to correctly interpret the terminologies and in computing the inventory closing value. Candidates are advised to read widely and prepare well for the examination for better performance.

SOLUTION 4

a. The Transparency Portal is a specially designed website by the Federal Government of Nigeria (FGN) to keep the Public informed about the financial operation to the citizens and other interested parties. It is in line with the government zero tolerance for corruption.

b. The purpose of the publication is for
   i.   accountability
  ii.   transparency
 iii.   probity
  iv.   Zero tolerance for corruption
   v.   and to improve good governance

c. According to Nigerian Open Treasury Portal Policy, no agency or arm of government is exempted from publishing their financial transactions in the portal.

    Exemptions are only granted for:
    i.   Sensitive national security related transactions of securities Agencies such as DSS, NIA & Police Intelligence Gathering Agencies, National Security Adviser's office and other agencies handling sensitive or classified information.
    ii. Ongoing investigation or prosecutions
    iii. Confidential or privileged information
    iv. Personal data of individuals

d.
   i.   Daily Treasury Statement
  ii.   Daily payment report
 iii.   Monthly budget performance report within 7days of the end of the month
  iv.   Monthly fiscal accounts within 14days of the end of the month
   v.   Quarterly financial statement by MDA
  vi.   Quarterly consolidated financial statement
 vii.   Annual General Purpose Financial Statements

Examiner's comments

The question tests candidates' knowledge and understanding of the Federal Government Transparency Guidelines and Open Treasury Portal Policy. The requirements of the question involve the explanation of Transparency Portal, the purpose of publication on the Open Treasury Portal, who is exempted from this publication and reports approved to be on this portal. Few candidates approached the question as only 15% attempted, and the general performance was poor. Only about 01% of the candidates scored above 50% of total marks obtainable.

The commonest pitfall was that there was apparent lack of understanding of the question and hence the inappropriate responses to the requirements of the question.

Candidates are required to make use of standard textbooks on Public Finance and the Institute's Study Text for requisite information and understanding of this aspect of the syllabus.

SOLUTION 5

The investment term under the Pension Reform Act 2014:

a.   i.   <u>Programmed Withdrawal Meaning</u>:
Programmed Withdrawal is a *stream of income on re-investing the balance in the Retirement Savings Accounts with the *Pension Fund Administrator for a given period of years.

<u>Features</u>:
1. Programmed Withdrawal generate stream of incomes or funds to the retiree on monthly or quarterly or half-year basis.
2. In the case of death, any balance in the Retirement Savings Accounts will be paid to the named next of kin(s) or beneficiar(y)(ies).
3. A retiree on Programmed Withdrawal can change to Retiree Life Annuity, after at least one (1) year of being on Programmed Withdrawal with one-month notice.

ii.   <u>Retiree Life Annuity Meaning</u>:
Retiree Life Annuity is a stream of income received or accrued or derived from re-investing the balance in the *Retirement Savings Accounts as the "Premium" with *Life Insurance or Assurance Company.

<u>Features</u>:
1. *Retiree Life Annuity provides a guaranteed periodic incomes or funds to the retirees throughout his or her Life Assurance policy.
2. *Retiree Life Annuity is guaranteed for minimum of Ten (10) years or more.
3. *In the case of death, within the first ten years of retirement, the monthly annuity will be paid to the named next of kin(s) or beneficiary(ies) for the remaining years up to the Ten (10) years at the Present Value.
4. *A retiree-on-Retiree Life Annuity cannot change to Programmed Withdrawal, because Retiree Life Annuity is based on Life assurance policy.

b.   (i) <u>WORKING</u>:
*Years 1 -5: Cash Inflow N200, 000 @ 12months = N2, 400,000

*Years 6 -10: Cash Inflow N300, 000 @ 12 months = N3, 600,000

<div align="center">Dr. Emeka Osinnaike</div>

<div align="center">Computation of Retiree Life Annuity</div>

For the Year 2021-2031

Method 1:

Years	Cash flows	Discounting factor	@20% values
	₦'000		₦'000
0	(₦10, 000)	1.000	(₦10, 000)
1	2,400	0.8333	1,999.92
2	2,400	0.6944	1,666.56
3	2,400	0.5787	1,388.88
4	2,400	0.4840	1,161.60
5	2,400	0.4040	969.6
6	3,600	0.3369	1,212.84
7	3,600	0.2791	1,004.76
8	3,600	0.2326	837.36
9	3,600	0.1938	697.68
10	3,600	0.1615	581.4
(Net Present Value) NPV			1,520.6

OR
Method 2:

Years	Cash flows	DCF @20%	Present Values
	₦'000		₦'000
0	*(10,000)	*1.000	*(N10,000)
1 - 5	*2,400	*2.9944	*7,186.56
6 - 10	*3,600	*1.2039	*4,334.04
	Net Present Value (NPV)		*1,520,60

b **(ii) Comment or Decision Making or Advise:**
The Retiree Life Annuity computation above, reveal a positive Net Present Value (NPV) of ₦1,520,600 which indicate a viable project or investment.

Examiner's comments

The question tests candidates' knowledge and understanding of the Pension Reform Act 2014 (as amended). The requirement of the questions involved the explanation of terms: Programmed Withdrawal and Retiree Life Annuity. It also required the Candidates to compute the expected Net Present Value from a scenario.

Many candidates attempted this question as about 50% of the candidates attempting. Candidates' responses to the question were inadequate and lacking in-depth as only about 10% of them scored 50% of total marks obtainable. The commonest pitfall was their inability to exhibit the required knowledge to answer the question.

Candidates are advised to prepare better for future examinations. They should endeavour to cover all areas of the syllabus and make use of the Institute's Study Text.

SOLUTION 6

a) Uses of budget

Budgets are used for the following:

i. Planning
ii. Communication
iii. Motivation
iv. Standard for measurement of performance
v. Evaluation of economic and social policy
vi. Cost reduction technique
vii. Resource allocation

i. **Planning**
Budgets are used for planning. Budgets are plans to which monetary values are assigned to what are to be achieved in a determinable future time, for example, a year.

ii. **Communication**
Budgets assist in communicating horizontally and vertically. When budgets are being prepared, individuals, groups, communities and associations will inform government about their areas of interests. This is 'upward communication.' When the budget is approved, Government reads it to the members of the public and publishes it in the newspapers. This is 'communicating downwards'.

iii. **Motivation**
A budget is a target to be achieved. Government motivates the staff through promotions and improved conditions of service, for assisting in the full and successful implementation of the budget.

iv. **Standard for measurement of performance**
Since a budget is a target, it is a measure of performance. What is achieved is recorded and compared with the target of performance set. The process of implementation draws management attention to problem areas.

v. **Evaluation of economic and social policy**
Budgets are used to solve the social problems of inflation and unemployment.

vi. **Cost reduction technique**
Evaluation of operations and procedures may result in cost savings

vii. **Resource allocation**
Assigning limited resources to prioritise programmes and projects.

b) Functions of the budget office of the federation

a. Developing reasoned economic assumptions and forecasts;

b. Issuing budget guidelines to the Ministries and extra-ministerial departments;

c. Acting as the liaison between the Presidency, Ministries, Departments and Agencies (MDAs) during the budget preparation;

d. Compiling total revenue and expenditure estimates;

e. Drafting the budget speech;

f. Supervising and controlling the implementation of the budget;

g. Monitoring and evaluating the performance of programmes funded through the government budget;

h. Assessing the impact of the budget on the economy;

i. Developing formats of returns aimed at ensuring cost effectiveness in the use of government resources; and

j. Carrying out research on budget utilisation and the attainment of National or State objectives.

Examiner's comments

The question tests candidates' knowledge and understanding of government budget and Budget Office of the Federation.

The requirement of the questions involved the explanation of uses of government Budget as well as functions that are performed by the budget office.

Majority of the candidates attempted the question as 85% attempting. Their performance was just average as about 45% of the candidates scoring 50% of marks obtainable.

The commonest pitfall was the inability of most candidates that attempted the question in demonstrating good understanding of the functions performed by the budget office.

Candidates are advised to have a good grasp of this area in the syllabus. They should make use of the Institute's Study Text and previous diet past examination questions.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA
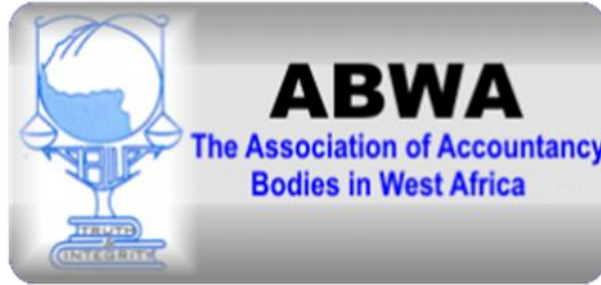
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
SEPTEMBER 2024 EXAMINATIONS (PART II)
QUANTITATIVE ANALYSIS

PLEASE READ THESE INSTRUCTIONS BEFORE COMMENCEMENT OF THE PAPER

EXAMINATION INSTRUCTIONS

1.   All solutions should be in ink. Any solution in pencil will not be marked.

2.   Read all instructions on each part of the paper carefully before answering the questions.

3.   Ensure that you do not answer more than the number of questions required for **Section B (The Essay Section).**

4.   Check your pockets, purse and mathematical sets, etc to ensure that you do not have prohibited items such as telephone handset, electronic storage device, wrist watches, programmable devices or any form of written material on you in the examination hall. You will be stopped from continuing with the examination and liable to further disciplinary actions including cancellation of examination result if caught.

5.   Do not enter the hall with anything written on your docket.

6.   Insert your examination number in the space provided above.

WEDNESDAY, SEPTEMBER 25, 2024

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

QUANTITATIVE ANALYSIS

Time Allowed: 3 hours

SECTION A: PART I   MULTIPLE-CHOICE QUESTIONS   (30 Marks)

ATTEMPT ALL QUESTIONS

Write ONLY the alphabet (A, B, C, D or E) that corresponds to the correct option in each of the following questions/statements

1. The arithmetic mean of a set of nine numbers is 12. Determine the ninth number if the arithmetic mean of the first eight numbers in the set is 9
    A.   108
    B.   36
    C.   24
    D.   12
    E.   2

2. Which of the following components of time series is less predictable?

    A.   Secular Trend variation
    B.   Seasonal variation
    C.   Cyclical variation
    D.   Irregular variation
    E.   Random variation

3. Which of the following hypothesis is the status quo hypothesis?

    A.   Two-tail hypothesis
    B.   Negative hypothesis
    C.   positive hypothesis
    D.   Alternative hypothesis
    E.   Null hypothesis

4. The average sales that a storekeeper makes per week is 15 cartoons of milk. State the Null and Alternate hypotheses to test that the average sales is different from 15
    A. H_0: $\mu > 15$ Vs H_1: $\mu < 15$
    B. H_0: $\mu \neq 15$ Vs H_1: $\mu = 15$
    C. H_0: $\mu = 15$ Vs H_1: $\mu > 15$
    D. H_0: $\mu = 15$ Vs H_1: $\mu \neq 15$
    E. H_0: $\mu = 15$ Vs H_1: $\mu < 15$

5. Calculate the Fisher Ideal index from the following pieces of information:
$\sum P_0 q_0 = 20,150$; $\sum P_1 q_0 = 21,550$; $\sum P_1 q_1 = 19,650$ and $\sum P_0 q_1 = 18,350$

   A.   100.12%
   B.   106.09%
   C.   106.90%
   D.   106.95%
   E.   107.01%

6. Mode can be estimated from

   A.   Multiple bar chart
   B.   Ogive
   C.   Frequency polygon
   D.   Histogram
   E.   Component bar chart

7. Which of the following is **NOT** correct about cluster sampling?

   A.   Unit that will constitute the sample is picked from each cluster proportionally
   B.   Sampling technique requires subdivision of the population into smaller groups
   C.   Clusters are picked by some form of randomness
   D.   Every unit in each cluster picked is part of the sample
   E.   Every cluster has equal chance of being part of the sample

8. What is the coefficient of variation for a set of data if the mean and the variance of the data are given as 4.29 and 1.03 respectively?

   A.   98.53
   B.   41.65
   C.   36.02
   D.   24.01
   E.   23.66

9. Which of the following indicates a very steep and upward sloping regression line? Gradient of the regression line is

   A.   Low and negative
   B.   High and positive
   C.   Low and positive
   D.   High and negative
   E.   Always positive

10. Calculate the simple average price relative index for the 2019 using 2017 as the base year from the table below

Items/commodities	Price per unit in thousands of naira		
	Year 2017	Year 2018	Year 2019
X	10	15	35
Y	15	21	32.5
Z	5	7.5	15
W	3	4	12.5

    A.   320.84%
    B.   32.084%
    C.   12.8%
    D.   4.167%
    E.   1.83%

11. Which of the following methods aims at removing fluctuations in a time series so that the general trend can be seen?

    A.   Moving average method
    B.   Smoothing method
    C.   Least squares method
    D.   Freehand sketch method
    E.   Semi- moving average method

12. Which of the following is used for the computation of an ith percentile?

    A. $Percentile(P_i) = L_i + \left(\dfrac{\dfrac{iN}{10} - \sum f_{i-1}}{f_i} \right) c, \ i = 1,2,3,........97,98,99$

    B. $Percentile(P_i) = L_i + \left(\dfrac{\dfrac{iN}{4} - \sum f_{i-1}}{f_i} \right) c, \ i = 1,2,3,........97,98,99$

    C. $Percentile(P_i) = L_i + \left(\dfrac{\dfrac{iN}{100} - \sum f_{i-1}}{f_i} \right) c, \ i = 1,2,3,........97,98,99$

    D. $Percentile(P_i) = L_i + \left(\dfrac{\dfrac{iN}{2} - \sum f_{i-1}}{f_i} \right) c, \ i = 1,2,3,........97,98,99$

E. $\quad Percentile(P_i) = L_i + \left(\dfrac{\dfrac{N}{4} - \sum f_{i-1}}{f_i} \right) c$, $i = 1, 2, 3, \ldots\ldots.97, 98, 99$

13. The sum to infinity of a series is 100. Find the first term if the common ratio is 0.75.

    A.   125
    B.   75
    C.   25
    D.   15
    E.   5

14. How many break-even points in quantities, are there in the breakeven chart, when Revenue function is quadratic and Cost function is linear?

    A.   One
    B.   Two
    C.   Three
    D.   Four
    E.   Five

15. If the equilibrium price and quantity for a commodity are respectively $p = ₦5.00$ and $q = 40$ units and the demand function is given as $P_d = 5q - 3$, where q is the total number of units bought, calculate the consumer's surplus

    A.   ₦3.68
    B.   ₦36.8
    C.   ₦368
    D.   ₦3,680
    E.   ₦36,800

16. Which of the following annuity types is paid at the end of the payment interval?

    A.   Annuity due
    B.   Ordinary Annuity
    C.   Common Annuity
    D.   Contingent Annuity
    E.   Perpetual Annuity

17. Which of the following is used to determine the desirability of an investment?

    A.   Annuity
    B.   Sinking fund
    C.   Net present Value
    D.   Internal rate of Return
    E.   Compound interest

18. In a region, it was discovered that 550 adults have bank accounts in First bank as well as Zenith but not in Skye bank. 50 adults have accounts in both Zenith and Skye bank but not in First bank, while 250 adults have accounts in all the three banks. Altogether, 1,750 adults have bank accounts in Zenith bank. Determine the number of adults that have bank accounts in Zenith bank only.

   A.   1,050
   B.   900
   C.   300
   D.   200
   E.   100

19. What is the shape of the feasible region of a graphical solution to a Minimisation Linear programming problem?

   A.   It is bounded
   B.   It is unbounded
   C.   It is a polygon
   D.   It is a hexagon
   E.   It is a nonagon

20. The shadow price of a given constraint in a linear programming problem is the rate of the improvement in the optimal

   A.   Objective function value
   B.   Constraint
   C.   Non-negativity
   D.   Solution
   E.   Variables function

21. All the following are merits of periodic review system in Inventory Model, **EXCEPT**

   A.   Obsolete items are eliminated from time to time
   B.   It allows for the spread of the load of purchasing department
   C.   Its setup may be unstable if demands are inconsistent
   D.   It allows for more efficient production planning
   E.   It allows for larger quantity discount and reduction in ordering cost

22. A special component is used in a large machine tool. The component has a limited life span, and the following data have been collected on the failure rate of the component (in percentages:

Months	1	2	3	4	5
Percentage of Failures	14	26	32	21	07

Calculate the average life span of the component.

A. 2.78
B. 2.79
C. 2.80
D. 2.81
E. 2.85

23. Which of the following is **NOT** a step in the use of the Northwest Corner Method for solving transportation problems?

A. Allocate to the Northwest cell of transportation matrix
B. Allow minimum supply and demand capacities
C. Check if allocation is equal to the supply or demand at the first row or column
D. Cross out the exhausted row or column, then move vertically or horizontally to the next cell
E. Allocate as much as possible to the smallest unit cost with minimum supply and demand condition in mind

24. The table below displays the daily supply of AZ Limited for a commodity and the probability of supply over a year

Number of items available for supply	Probability
1	0.11
2	0.20
3	0.28
4	0.27
5	0.14

Determine the random number interval when four items are available for supply if the system is simulated

A. 27 - 86
B. 58 - 85
C. 58 - 86
D. 59 - 85
E. 59 – 86

25. What is the shadow price for a non- critical situation where slack already existed in a linear programming problem?

A. One
B. Zero
C. Positive
D. Negative
E. Greater than one

26. Which of the following is **NOT** a reason for holding stock in an Inventory control model?

    A. It acts as a buffer for variations in demand and usage
    B. It takes merit of quantity discount by buying in large quantity
    C. It ensures stock - out
    D. It takes advantage of inflation or possible shortages
    E. It takes advantage of seasonal and price fluctuations

27. Data derived from existing published or unpublished records of government agencies, trade associations, research bureaus, magazines and individual research work are known as

    A. Raw data
    B. Primary data
    C. Tertiary data
    D. Secondary data
    E. Common data

28. Set up the initial simplex tableau for the Linear programming problem given below:

    $Z = 16x + 32y$

    Subject to the constraints:

    $3x + 2y \leq 3$

    $3x + 5y \leq 4$

    $x, y \geq 0$

A.

C_B	X_B	S_1	S_2	X	Y	B
0	S_1	3	2	1	0	3
0	S_2	3	5	0	1	4
Z		16	32	0	0	0	0

B.

C_B	X_B	X	Y	S_1	S_2	B
0	S_1	3	2	1	0	3
0	S_2	3	5	0	1	4
Z	-16	-32	0	0	0	0

C.

C_B	X_B	X	Y	S_1	S_2	B
0	S_1	3	2	-1	0	3
0	S_2	3	5	0	-1	4
Z	16	32	0	0	0	0

D.

C_B	X_B	X	Y	S_1	S_2	B
0	S_1	3	2	-1	0	3
0	S_2	3	5	0	1	4
Z		16	32	0	0	0	0

E.

C_B	X_B	X	Y	S_1	S_2	b
0	S_1	3	2	1	0	16
0	S_2	3	5	0	1	32
Z		3	4	0	0	0	0

29. A project consists of the following activities as tabulated in the table below:

Activity	Preceding Activity
A	-
B	-
C	A
D	B
E	B, C

State the number of dummies needed to draw a complete network diagram for the project?

A.   More than two dummies
B.   More than one dummy
C.   Two dummies
D.   One dummy
E.   Zero dummy

30. Which of the following is a similarity between transportation and assignment problems?

A.   Both are square matrices
B.   Both are solved by simplex method
C.   Both can be solved graphically
D.   Both are rectangular matrices
E.   Both have objective functions and non-negativity constraints

ATTEMPT ALL QUESTIONS

Write the correct answer that best completes each of the following questions/statements:

1. Data such as prices of goods and services, wages of workers in an industry and marks scored by candidates are under .... data.

2. Given the table below, the class boundary of the median and the lower class boundary of the first class are .... and .... respectively.

Hours	1 - 1.99	2 - 2.99	3 - 3.99	4 - 4.99	5 - 5.99	6 - 6.99	7. 7.99
Frequency	9	8	13	8	4	7	11

3. The Level of significance is the .... of the willingness to risk a Type 1 error.

4. If the 25th, 50th and 75th percentiles for a set of data are respectively given as 65.8, 91.7 and 98.3, the semi - interquartile range is ....

5. Two judges, A and B, rank 5 contestants in a talent hunt as shown in the table below:

| Contestant	X_1	X_2	X_3	X_4	X_5
Rank by A	4	5	1	3	2
Rank by B	3	2	1	5	4

The spearman's rank correlation coefficient of the two Judges A and B is ....

6. The two models of time series are .... and .... models.

7. The simple average price relative for the year 2020 if 2019 is chosen as the base year given that a country's wholesale prices of Beans, Garri, and Rice for the years 2018, 2019 and 2020 as detailed in the table below is ....

Commodity	2018	2019	2020
Beans	41.5	50.0	48.7
Garri	33.3	44.6	45.9
Rice	25.4	41.5	42.9

8. The probability of obtaining NO HEAD and NO PRIME NUMBER when three coins and a die are thrown together is ....

9. The intersection of two sets is a sub-set which contains elements that are .... to the two sets.

64

10. If $n((A \cup B)-C)=1000$ in the Euler-Venn diagram shown below, the value of y is ....
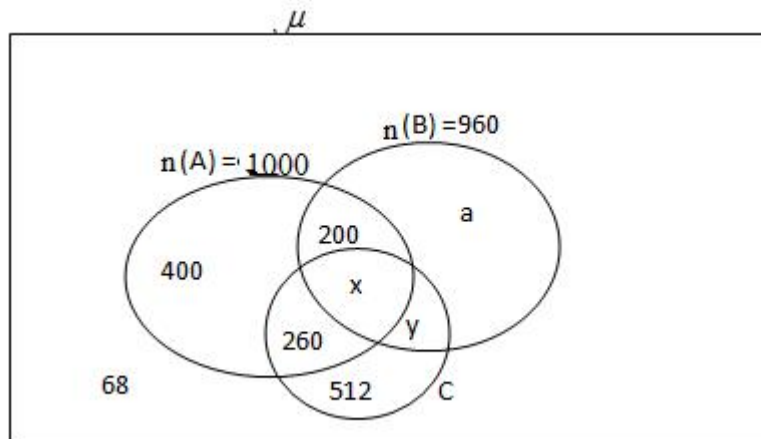
11. The sum to infinity of the series $1+\dfrac{1}{2}+\dfrac{1}{4}+\lambda$ is ....

12. The marginal revenue of a function is given by MR = $6q$ - 5 in thousands of naira. The unit price of selling 500 units is ....

13. The symbol used for dummy activity in a network diagram is an arrow with .... lines.

14. Given the unit transportation costs in the table below, the cost of transporting the fourth allocation using the Least Cost Method is ....

Warehouse	Shop				Supply (units)
	W	X	Y	Z	
A	₦5	₦7	₦10	₦4	50
B	₦2	₦10	₦4	₦9	25
C	₦6	₦7	₦3	₦6	55
Demand (units)	30	30	47	13	

15. The major objective of inventory model is to .... total inventory cost.

16.

Month	1	2	3	4
Probability of failure	0.15	0.25	0.32	0.28
Cumulative probability	0.15	0.40	0.72	1.00

There are 750 items. They can be replaced en mass at ₦3 per item and individually as they fail at the cost of ₦12. If all the items are replaced simultaneously at fixed interval, the total cost of replacement at the end of the second month will be ....

65

17. A linear programming problem, with more than two decision *variables,* can only be solved by .... method.

18. If the primal form of a Linear Programming problem has *n* variables and *m* *constraints*, then its dual form will contain .... variables and .... constraints.

19. Given that the annual demand is 75,000 units. These are purchased at ₦15 each. If the ordering cost is ₦250 per order with carrying cost of 25% per annum per purchase price, determine the EOQ.

20. The cost of transporting the last allocation using the North West Corner Method for the transportation problem given in the table below is ....

Factory	Warehouse				Supply (units)
	1	2	3	4	
A	₦23	₦20	₦27	₦23	9200
B	₦31	₦28	₦23	₦29	6800
C	₦26	₦24	₦38	₦25	5300
Demand (units)	5600	7700	4100	3900	

SECTION B: ATTEMPT ANY FOUR QUESTIONS IN THIS SECTION (50 MARKS)

QUESTION 1

a. A customer's preference for large package size of noodles is assumed to increase with household size. A researcher had generated the information presented in the table below to examine whether this relationship is indeed true. Preference is measured on a 7-point scale from most dislike (1) to most preferred (7).

Consumer	Preference	Household size
1	3	2
2	5	4
3	4	5
4	7	6
5	7	7
6	2	3
7	5	5
8	4	3
9	4	3
10	6	6

(i) Compute the spearman's rank correlation coefficient and (ii) interpret your result.
(5½ Marks)

b. The following data are obtained concerning a Country Communication Commission (CCC) expenditure and sales of six telecommunication firms:

Firm	Sales (₦) M	CCC (₦) M
TVC	50,970	419
LTV	300	12
ZAIN	9,980	162
CHANNELS	201	13
MTN	1,904	3
GLO	794	5

Compute the regression line using the least squares method, where CCC is the dependent variable and sales is the independent variable and hence, predict the CCC expenditure for ₦10 billion sales? (7 Marks)
(Total 12½ Marks)

QUESTION 2

a. A manufacturer of cereal wants to test the performance of one of its filling machines. The machine is designed to discharge an average amount of $\mu = 15$ ounces per box and the manufacturer wants to detect any departure from this setting. This quality study calls for randomly sampling 100 boxes from the day's production run to determine whether the mean fill for the run is 15 ounces per box. Set up a test hypothesis for this study and test it at 1% level of significance given that the sample mean is 14.75 ounces and sample standard deviation is 0.6 ounce. (7 Marks)

b. A researcher, in accounting, is comparing two calculation methods: straight-line and accelerated depreciation. He wonders whether they lead to differences in report earnings. He selects two samples of firms: one, using the straight-line method and the other, the accelerated method, he obtains the results as summarised in the table below;

STRAIGHT-LINE METHOD	ACCELERATED METHOD
$n_1 = 300$	$n_2 = 400$
$\overline{X_2} = ₦540,000$ earnings	$\overline{X_2} = ₦590,000$ earnings
$s_1 = ₦120,000$	$s_2 = ₦125,000$

Required:

Test at $\alpha = 2\%$ reverse null hypothesis that there is no difference in reported earning between the two groups. (5½ Marks)

(Total 12½ Marks)

QUESTION 3

a. In a class of final year candidates, the probability that a candidate picked at random will pass an examination is $^2/_3$. Find the probability that if:

i. Two candidates are selected at random, only one will pass the examination;

ii. Three candidates are selected at random, all will fail the examination;

iii. Three candidates are selected at random, only one will pass the examination. (6 Marks)

b. The probability of obtaining a tail when an irregular coin is tossed is $^1/_4$. If three of such coins are tossed together, find the probability of obtaining:

i. Exactly three heads;

ii. At most two heads; and

iii. No head (6½ Marks)

(Total 12½ Marks)

QUESTION 4

The revenue from the sales of x units of one of the products of a company is given by $R = 210x - 3x^2$ and the supply function by $P = 30 + 3x$, both in naira.

You are required to:

a. Obtain the demand function. (2 Marks)
b. Obtain the price elasticity of demand when price is fixed at ₦50.00. (4 Marks)
c. Determine the company's producers' surplus. (6½ Marks)

(Total 12½ Marks)

QUESTION 5

The table below shows details of availability of manufactured products at three regional factories: Kano, Enugu and Lagos and demand requirements from five markets: A, B, C, D and E. The unit transportation costs (₦) are equally as shown in the table:

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6	5	1,050
Enugu	6	9	10	8	7	850
Lagos	10	6	9	7	8	1,350
Market capacity	500	575	650	800	725	

Determine the initial basic feasible total cost of transportation using Vogel's Approximation Method (VAM). **(Total 12½ Marks)**

QUESTION 6

An organisation has five Executive Managers with five Investment portfolios to examine. The proceeds (in ₦'000) that each Executive manager makes when they examine each investment portfolio are given as follows:

		Executive Managers				
		1	2	3	4	5
	A	90	80	70	130	80
	B	95	83	71	137	83
Portfolios	C	80	71	62	119	74
	D	85	77	65	125	77
	E	81	69	61	117	73

a. How should the investment portfolios be assigned (one per Executive Manager) in order to maximise the total proceeds from all the investment portfolios using Hungarian method? (10½ Marks)
b. Calculate the maximum total proceeds from the investment portfolios for the organisation. (2 Marks)

(Total 12½ Marks)

FORMULAE

Sample variance, $s^2 = \dfrac{\sum (x - \bar{x})^2}{n-1}$

Economic Order Quantity

$Q = \sqrt{\dfrac{2cd}{n}}$

$Z_{cal} = \dfrac{\bar{x} - \mu}{\dfrac{\sigma}{\sqrt{n}}}$

Slope of a regression equation

$b = \dfrac{n\sum xy - \sum x \sum y}{n\sum x^2 - \left(\sum x\right)^2}$

Elasticity of demand, $e = \left(-\dfrac{p}{q}\right)\left(\dfrac{dq}{dp}\right)$

The 95% confidence interval for μ

$= \bar{x} \pm t_{\alpha,n-1}\dfrac{s}{\sqrt{n}}$

The trend equation, $y = a + bt$, where $t = x_i - x_m$

$b = \dfrac{\sum ty}{\sum t^2}$, $\quad a = \bar{y} - bx_m$, $\quad x_m$ = median of x values

$SARPI = \dfrac{\sum\left(\dfrac{P_n}{P_o} \times 100\right)}{N}$

$SAPI = \dfrac{\sum P_{ni}}{\sum P_{oi}} \times 100$

$t = \dfrac{p}{\sqrt{\dfrac{pq}{n}}}$

EOQ with stock-out

$Q = \sqrt{\dfrac{2cd}{h}} \times \sqrt{\dfrac{h + c_s}{c_s}}$

$LPI = \dfrac{\sum p_1 q_o}{\sum p_o q_o} \times 100$

$Z = \dfrac{p - \hat{p}}{\sqrt{\dfrac{\hat{p}(1 - \hat{p})}{n}}}$

$$Q_i = L_{Q_i} + \left(\dfrac{\dfrac{iN}{4} - \sum f_{Q_i}}{f_{Q_i}} \right) c$$

$$D_i = L_{D_i} + \left(\dfrac{\dfrac{iN}{10} - \sum f_{D_i}}{f_{D_i}} \right) c$$

$$P_i = L_{P_i} + \left(\dfrac{\dfrac{iN}{100} - \sum f_{P_i}}{f_{P_i}} \right) c$$

Spearman's rank correlation coefficient

$$r = 1 - \dfrac{6\sum d^2}{n(n^2 - 1)}$$

EOQ with gradual replenishment

$$Q = \sqrt{\dfrac{2cd}{h\left(1 - \dfrac{d}{r}\right)}}$$

$$\text{Length of Inventory cycle} = \dfrac{Q}{d}$$

$$\text{Number of } production\ runs = \dfrac{d}{Q}$$

$$Production\ \cos t = Ordering\ \cos t + Holdering\ \cos t$$

$$Mode = L_{mo} + \left(\dfrac{\Delta_1}{\Delta_1 + \Delta_2} \right) c$$

SUGGESTED SOLUTIONS

SECTION A: PART 1

MULTIPLE- CHOICE SOLUTIONS

1. B
2. D
3. E
4. D
5. E
6. D
7. A
8. E
9. B
10. A
11. B
12. C
13. C
14. B
15. D
16. B
17. C
18. B
19. B
20. A
21. C
22. D
23. E
24. D
25. B
26. C
27. D
28. A
29. D
30. E

Workings (MCQ)

1. Arithmetic mean

    Let y represent the 9th number.

    Arithmetic mean = Sum of terms/Number of terms.

    A.M. of the first 8 numbers is 9 i.e $9 = \dfrac{\sum x}{8} \Rightarrow \sum x = 9 \times 8 = 72$

A.M of the first 9 numbers is 12 i.e $12 = \dfrac{\sum x + y}{9} \Rightarrow \sum x + y = 12 \times 9$

$$\sum x + y = 108 \Rightarrow y = 108 - 72 = 36$$

Answer is B

5. Pieces of information supplied are

$\sum P_0 q_0 = 20{,}150$; $\sum P_1 q_0 = 21{,}550$; $\sum P_1 q_1 = 19{,}650$ and $\sum P_0 q_1 = 18{,}350$

Fisher's Ideal price index $= \sqrt{\left(\dfrac{\sum p_1 q_0}{\sum p_0 q_0}\right) \times \dfrac{\sum p_1 q_1}{\sum p_0 q_1}} \times 100\%$

$$= \sqrt{\left(\dfrac{21550}{20150}\right) \times \left(\dfrac{19650}{18350}\right)} \times 100\%$$

$$= \sqrt{1.1452} \times 100\%$$

$$= 1.07014 \times 100\% = \mathbf{107.014\%}$$

$$\approx 107.01\% \quad \text{Answer is E}$$

8. Coefficient of Variation $= \dfrac{\sigma}{\bar{x}} \times 100$, $\sigma = \sqrt{\text{var}iance} = \sqrt{1.03} = 1.0149$, $\bar{x} = 4.29$

$$= \dfrac{1.0149}{4.29} \times 100, = 0.236573 = 23.657342 \approx 23.66$$

Answer is D

10. MEAN RELATIVE PRICE INDEX

Items/Commodities	Year 2017	Year 2019	$\dfrac{P_{2019}}{P_{2017}}$
X	10	35	3.5
Y	15	32.5	2.167
Z	5	15	3
W	3	12.5	4.167
TOTAL			$\sum\left(\dfrac{P_{2019}}{P_{2017}}\right) = 12.834$

Simple Average price relative $= \dfrac{\sum\left(\dfrac{P_{2019}}{P_{2017}}\right)}{n} \times 100$

$$= \dfrac{12.8337 \times 100}{4}$$

$$= \mathbf{320.84\%}$$

Answer is A

13. Sum to infinity of a series

Common ratio, r = 0.75 < 1. It is a G.P.

Formula for sum to infinity of a G.P. is $S_\infty = \dfrac{a}{1 - r}$,

For $S_\infty = 100, r = 0.75$, we have

$$100 = \frac{a}{1 - 0.75}$$
$$a = 100 \times 0.25 = 25$$

Answer is C

15. Consumer's surplus (CS)

Formula for CS is $\displaystyle\int_0^{q_e} D(q)dq - p_e q_e$

Thus,

$$\int_0^{q_e} D(q)dq - p_e q_e = \int_0^{40} (5q - 3)dq - 5 \times 40$$
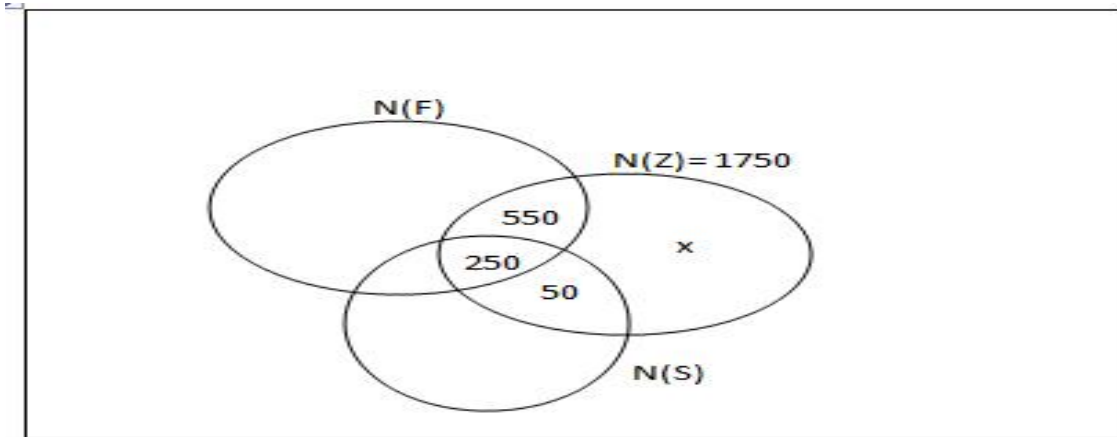$$= \frac{5q^2}{2} - 3q\Big|_0^{40} - 5 \times 40$$
$$= \frac{5(40)^2}{2} - 120 - 200$$
$$= 4000 - 120 - 200 = 3680$$

Answer is D

18.

From the Venn diagram
550 + 250 + 50 + x = 1750
850 + x = 1750
x = 1750 - 850 = 900
Answer = B

22.

Months	1	2	3	4	5
Percentage of Failures	14	26	32	21	07

Average life span of the component = (1 x 0.14) + (2 x 0.26) + (3 x 0.32) + (4 x 0.21)
+ (5 x 0.07)

= 0.14 + 0.52 + 0.96 + 0.84 + 0.35

= 2.81

Answer is D

24. SIMULATION USING PROBABILITY TO FIND RANDOM NUMER INTERVAL

Number of items available for supply	Probability	Cumulative Probability	Random number Interval
1	0.11	0.11	00 - 10
2	0.20	0.31	11 - 30
3	0.28	0.59	31 - 58
4	0.27	0.86	59 - 85
5	0.14	1.00	86 - 99

Answer is D: 59 – 85

27. Calculation of minimum cost using least cost method in an unbalanced transportation problem.

Plant	Warehouse			Monthly capacity
	A	B	C	
1	21	20	22	12300
2	20	23	19	2900
3	21	21	21	2550
4	22	21	20	2250
Monthly Demand	7400	3600	5700	

Plant	Warehouse			
	A	B	C	Dummy
1	5400	3600		3300
2			2900	
3	2000		550	
4			2250	

Plant to Warehouse COST

1	A	= 5400 X 21	= 113,400
1	B	= 3600X 20	= 72000
2	C	= 2900X 19	= 55100
3	A	= 2000 X 21	= 42000
3	C	= 550 X 21	= 11550
4	C	= 2250 X 20	= 4500
1	Dummy = 3300 x 0		= 0
	TOTAL	=	₦339, 050.00

Answer B

28. $Z = 16x + 32y$

Subject to the constraints:

$$3x + 2y \leq 3$$
$$3x + 5y \leq 4$$
$$x, y \geq 0$$

Standard form is

$$Z = 16x + 32y + 0S_1 + 0S_2$$

Subject to the constraints:

$$3x + 2y + S_1 + 0S_2 = 3$$
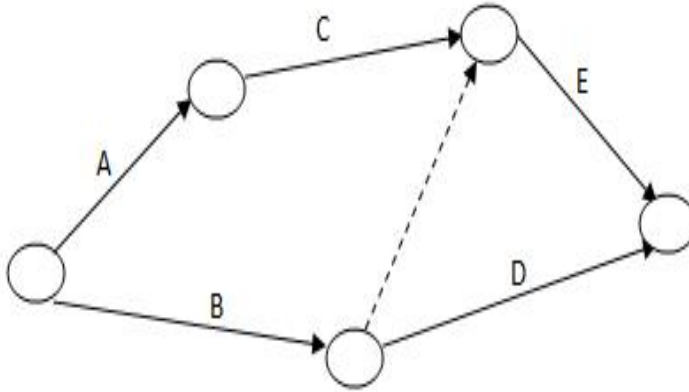$$3x + 5y + 0S_1 + S_2 = 4$$
$$x, y, S_1, S_2 \geq 0$$

Where S_1, S_2 are the slack variables added

The initial simplex tableau is given below

C_B	X_B	X	Y	S_1	S_2	b
0	S_1	3	2	1	0	3
0	S_2	3	5	0	1	4
Z		16	32	0	0	0	0

Answer D

29. The drawing of network diagram and introduction of dummy:

Answer D. One dummy

Examiner's comment

This has 30 questions covering a wide range of Quantitative Analysis concepts such as Mean, Standard Deviation, Regression, Transportation, Linear Programming problem based on simplex method and time value of money.

All the questions are to be answered by the candidates. More than 75% of the candidates performed very well in all the questions.

The average score is 16 out of 30 marks, allocated to this part of section A.

The highest and lowest scores recorded are respectively 26 and 5 marks.

Generally, fundamental probability concepts were well understood by the majority of the candidates.

The general pitfalls identified include:

Questions involving optimisation and decision analysis under uncertainty were poorly attempted; and

Inability to interpreting worded questions leading to incorrect selection of options in the questions.

SECTION A: PART II

SHORT-ANSWER SOLUTIONS

1. Continuous or numeric or quantitative

2. 2.995 - 3.995, 0.995 (in that order)

3. Maximum probability

4. 16.25

5. 0.1

6. Additive, multiplicative or multiplicative, additive (in any order)

7. 101.22%

8. 3/48 or 1/16 or 0.0625

9. Common

10. $y = 220$

11. 2

12. Price = ₦1,495.00

13. Broken/deleted

14. The cost is N52.00

15. Minimize

16. ₦3,026.25

17. Simplex method

18. m, n in that order

19. 3,163 units

20. ₦97,500.00

Workings (SAQ)

2. Median

(Hrs)	1-1.99	2-2.99	3-3.99	4-4.99	5-5.99	6-6.99	7-7.99
Frequency	9	8	13	8	4	7	11

(Hrs)	F	Class boundary	CF
1 - 1.99	9	0.995 (LOWER CLASS BOUNDARY) - 1.995	9
2 - 2.99	8	1.995 - 2.995	17
3 - 3.99	13	2.995 - 3.995 MEDIAN CLASS BOUNDARY	30

4 - 4.99	8	3.995 - 4.995	38
5-5.99	4	4.995 - 5.995	42
6-6.99	7	5.995 - 6.995	49
7-7.99	11	6.995 - 7.995	60

Answer = 2.995- 3.995, 0.995

4. Semi - interquartile range = $\dfrac{Q_3 - Q_1}{2}$

$P_{25} = Q_1 = 65.8$, $P_{75} = Q_3 = 98.3$

Semi - interquartile range = $\dfrac{Q_3 - Q_1}{2} = \dfrac{98.3 - 65.8}{2}$

$$= \dfrac{32.5}{2}$$

$$= 16.25 \text{ Answer}$$

5. Spearman's rank correlation coefficient

Contestant	X_1	X_2	X_3	X_4	X_5	
Rank by A (R_A)	4	5	1	3	2	
Rank by B (R_B)	3	2	1	5	4	
d = R_A - R_B	1	3	0	-2	-2	
d²	1	9	0	4	4	$\sum d^2 = 18$

$$r = 1 - \frac{\sum d^2}{n(n^2 - 1)}$$

$$= 1 - \frac{6(18)}{5(5^2 - 1)}$$

$$= 1 - \frac{108}{120}$$

$$= 1 - 0.9$$

$$= 0.1$$

r = 0.1 Answer

7. Mean price relative

Commodity	2018	2019 (P_0)	2020 (P_n)	$\dfrac{p_n}{p_o}$
Beans	41.5	50.0	48.7	0.974
Garri	33.3	44.6	45.9	1.029
Rice	25.4	41.5	42.9	1.034
		136.1	137.5	3.037

$$\text{Simple average price relative} \quad = \frac{\sum \frac{P_n}{P_o} \times \frac{100}{1}}{N}\%$$

$$= \frac{3.037}{3} \times \frac{100}{1}\%$$

$$= 101.22\%$$

8. Event and probability

|	1	2	3	4	5	6
HHH	HHH1	HHH2	HHH3	HHH4	HHH5	HHH6
HHT	HHT1	HHT2	HHT3	HHT4	HHT5	HHT6
HTH	HTH1	HTH2	HTH3	HTH4	HTH5	HTH6
HTT	HTT1	HTT2	HTT3	HTT4	HTT5	HTT6
THH	THH1	THH2	THH3	THH4	THH5	THH6
THT	THT1	THT2	THT3	THT4	THT5	THT6
TTH	TTH1	TTH2	TTH3	TTH4	TTH5	TTH6
TTT	TTT1	TTT2	TTT3	TTT4	TTT5	TTT6

Let X be the outcome no head and no prime number

X = {TTT1, TTT4, TTT6}

Pr(X) = 3/48 = 1/16 Answer

10. Euler diagram
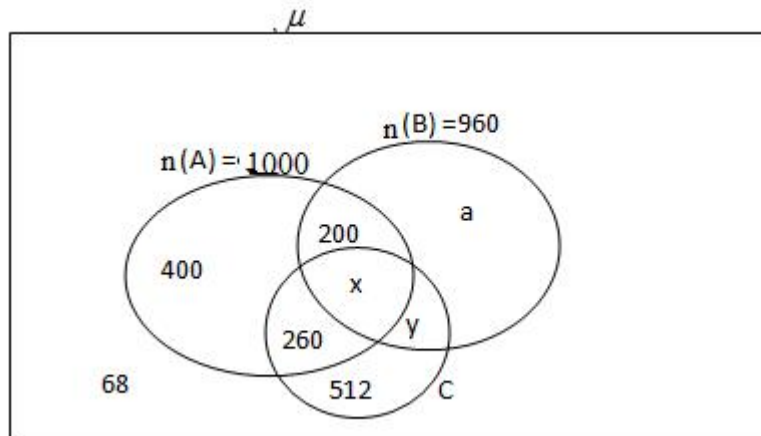
$$n\big((A \cup B) - C\big) = 1000$$

From the diagram, we have

400 + 200 + a = 1000

a = 1000 - 600 = 400

400 + 200 + 260 + x = 1000

x = 1000 - 860 = 140

200 + 140 + 400 + y = 960

y = 960 - 740 = 220

11. SUM TO INFINITY

$$S_\infty = \frac{a}{1-r}, \ S_\infty = ?, r = \frac{1}{2} \quad a = 1$$

$$S_\infty = \frac{1}{1-\frac{1}{2}} = \frac{1}{\frac{1}{2}} = 1 \div \frac{1}{2} = 1 \times \frac{2}{1}$$

$$S_\infty = 2$$

Answer = 2

12.   MR = 6q - 5

Revenue = $\int MRdq = \int (6q-5)dq = 3q^2 + 5q + C$

when q = 0, R=0, C=0

Revenue = $3q^2 + 5q$

$$price = \frac{R}{q} = \frac{3q^2 - 5q}{q} = \frac{3(500)^2 - 5(500)}{500} =$$

$$= \frac{747500}{500} = 1495$$

Price = ₦1,495.00

14.

Warehouse	Shop					Supply
	W	X	Y	Z	Dummy	
A	5 (5)	22 (7)		13 (4)	10 (1)	5̶0̶ 4̶0̶ 2̶7̶ 2̶2̶ 0
B	25 (2)					2̶5̶ 0
C		8 (6)	47 (3)			5̶5̶ 0
Demand	3̶0̶ 5̶ 0	3̶0̶ 2̶2̶ 0	4̶7̶ 0	1̶3̶ 0		

Fourth allocation is 13 units from the table that is 13 to be transported from warehouse A to Shop Z giving the cost of transportation as 13 x ₦4 = ₦52.00

16.   Replacement analysis (Group replacement)

Number of failures at the end of Month 1: $N_1 = N_0 P_1$ = 750 x 0.15 = 112.5

Number of Failures at the end of Month 2:

$$N_2 = N_0 P_2 + N_1 P_1 = (750 \text{ x } 0.25) + (112.5 \text{ x } 0.15) = 204.375$$

End of Month	Total cost of replacement	Average Cost per month
1	750 x 3 + 112.5 x 12	3606
2	750 x 3 + (112.5 + 204.375) x 12	3026.25

From the table above, the total cost of replacement at the end of second month = ₦3,026,25.

19. $EOQ = \sqrt{\dfrac{2DC_0}{C_h}}$

$= 75,000,$

$C_0 = 250$, $C_h = 25\% \times 15 = ₦3.75$

$EOQ = \sqrt{\dfrac{2 \times 75,000 \times 250}{3.75}}$

$EOQ = 3,162.2776 \approx 3,163$ units

20. Balanced transportation cost using NWCM

Factory	Warehouse				Supply
	1	2	3	4	
A	(5600_1) ₦23	(3600_2) ₦20	₦27	₦23	0
B	₦31	(4100_3) ₦28	(2700_4) ₦23	₦29	0
C	₦26	₦24	(1400_5) ₦38	(3900_6) ₦25	0
Demand	0	0	0	0	

Last allocation is 3900 units from Factory C to Warehouse 4.

Hence, the cost of transporting the last allocation is 3900 X ₦25 = ₦97,500.00

Examiner's comment

This has 20 questions which cover the syllabus fairly. Majority of the topics within the syllabus are tested.

The average score was 5 marks. Highest and lowest scores were 15 and zero.

Similar pitfalls, as identified under the Multi-choice questions, were also present in this Short-Answer Question.

SECTION B:
SOLUTION 1
ai

Consumer	Preference (X)	household size (Y)	r_x	r_y	d	d^2
1	3	2	9	10	-1	1
2	5	4	4.5	6	- 1.5	2.25
3	4	5	7	4.5	2.5	6.25
4	7	6	1.5	2.5	-1	1
5	7	7	1.5	1	0.5	0.25
6	2	3	10	8	2	4
7	5	5	4.5	4.5	0	0
8	4	3	7	8	-1	1
9	4	3	7	8	-1	1
10	6	6	3	2.5	0.5	0.25
Total						17

$$\text{Spearman's rank correlation coefficient } = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6(17)}{10(10^2-1)}$$

$$= 1 - \frac{102}{990} = 1 - 0.1030 = \mathbf{0.896969}$$

$$\approx \mathbf{0.897}$$

ii. Hence, there is a strong positive relationship between the size of a household and preference for large package size of noodles. This implies that, as the size of a household becomes large, the house will buy more of large sized noodles.

b. Let the regression line be y = bx + a

By least squares method, $$b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

$$a = \frac{\sum y}{n} - b\frac{\sum x}{n}$$

Firm	X	Y	x^2	xy
TVC	50,970	419	2,597,940,900	21,356,430
LTV	300	12	90,000	3,600
ZAIN	9,980	162	99,600,400	1,616,760
CHANNELS	201	13	40,401	2,613
MTN	1,904	3	3,625,216	5,712
GLO	794	5	630,436	3,970
	64,149	614	2,701,927,353	22,989,085

$$b = \frac{6(22989085) - (64149)(614)}{6(2701927353) - (64149)^2} = \frac{137934510 - 39387486}{16211564118 - 411509420\ 1}$$

$$= \frac{98547024}{12096469917} = 0.008146758 \approx 0.008147$$

$$a = \frac{614}{6} - 0.008147\frac{(64149)}{6} = 102.3333333 - 87.1036505 = 15.22968283$$

$$a \approx 15.2297$$

Therefore, the regression line is $y = 0.008147x + 15.2297$ in (₦) M

CCC expenditure for ₦10 billion sales, is obtained by putting $x = 10,000$ in the regression line equation:

$y = 0.008147(10000) + 15.2297 = 81.47 + 15.2297 = 96.6997$

y = ₦96.7 M or ₦97 M

Examiner's comment

It tests the candidates' knowledge of correlation and regression analysis. About 81% of the candidates attempted the question with 73% of them scoring 40% and above.

The average score was 7 marks out of 12½ allocated to the question.

The pitfall identified was the inability of some of the candidate to quote current formulae for both "b" and "a" parameters in the repression here: y=a+bx.
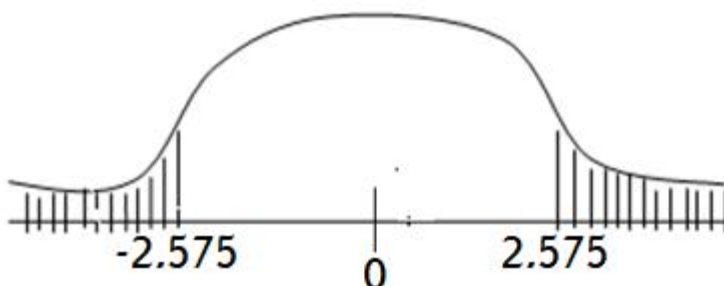
SOLUTION 2

a. $H_0 : \mu = 15$ VS $H_1 : \mu \neq 15$

$\bar{X} = 14.75$, $\sigma = 0.6$, $\alpha = 0.01$, $\frac{\alpha}{2} = \frac{0.01}{2} = 0.005$, $Z_{\frac{\alpha}{2}} = Z_{0.005} = 2.575$

For a two-tail test, $Z_{0.005} = \pm 2.575$

n = 100,

$$Z_{cal} = \frac{\bar{X} - \mu}{S/\sqrt{n}} = \frac{14.75 - 15}{0.6/\sqrt{100}} = -\frac{0.25}{0.6/10} = -\frac{0.25}{0.06} = -4.1667$$

Since the obtained Z_{cal} = -4.1667 (a negative number), $Z_{0.005} = -2.575$ is adopted to determine the rejection region.

-2.575   0   2.575

Since Zcal falls in the rejection region, therefore, we reject the null hypothesis and accept the alternative hypothesis and conclude that the mean fill for the run is not 15 ounces per box. i.e. $\mu \neq 15$

b.　　**H₀** : $(\mu_1 - \mu_2) = 0$ vs **H₁** : $(\mu_1 - \mu_2) \neq 0$ **OR** $H_o : \mu_1 = \mu_2$ vs $H_1 : \mu_1 \neq \mu_2$

STRAIGHT-LINE METHOD	ACCELERATED METHOD
n₁ = 300	n₂ = 400
$\overline{X}_2 =$ ₦540,000 earnings	$\overline{X}_2 =$ ₦590,000 earnings
$S_1 =$ ₦120,000	$S_2 =$ ₦125,000

α = 2% = 0.02
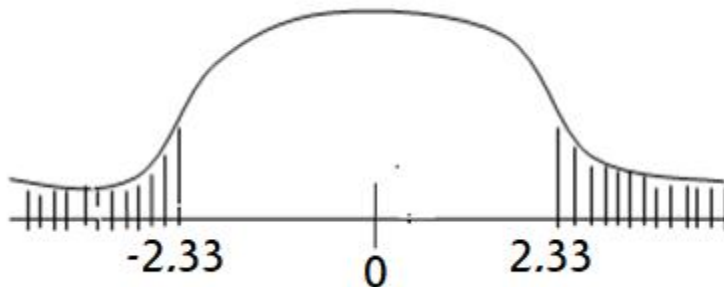
$$Z_a = 0.02$$

$$Z_{\frac{a}{2}} = Z_{0.0} = \pm 2.33$$

$$\frac{\alpha}{2} = \frac{0.02}{2} = 0.01$$

$$Z_{cal} = \frac{\overline{X}_1 - \overline{X}_2 - (\mu_1 - \mu_2)}{\sqrt{\dfrac{s^2_1}{n_1} + \dfrac{s^2_2}{n_2}}} = \frac{540,000 - 590000 - 0}{\sqrt{\dfrac{120000^2}{300} + \dfrac{125000^2}{400}}} = -\frac{50000}{\sqrt{48000000 + 39062500}} =$$

$$Z_{cal} = \frac{50000}{\sqrt{87062500}} = -\frac{50000}{9330.7288} = -5.35863822 \approx -5.3586$$

-2.33　　　0　　　2.33

Since Z_cal falls in the rejection region, therefore, we reject the null hypothesis and accept the alternative hypothesis and conclude that there is significant difference between the two calculation methods. Hence, there are differences in report earnings. i.e. $\mu_1 \neq \mu_2$

Examiner's comment

This is on Statistical Inference based on Test of Hypothesis. The question was poorly attempted by the candidates. About 23% of them attempted the question with about 40% of them scoring 40% and above.

The identified pitfall was the inability of the candidates to set up the null and alternative hypotheses.

In Part (b) of the question, candidates misunderstood the requirement, and they failed to correctly set up the hypothesis for comparing two independent groups. The average score was 4 out of 12½ allocated to the question.

SOLUTION 3

a.i   Let A represent the first candidate and B the second candidate .
Probability of A passing the examination is Pr(A') = 2/3
Probability of A not passing the examination is Pr(A) = 1- 2/3 = 1/3
Probability of B passing the examination is Pr(B') = 2/3
Probability of B not passing the examination is Pr(B) = 1- 2/3 = 1/3
Probability that one candidate will pass if two candidates are selected at random for the examination is

$$Pr(A \cap B^1) \text{ or } Pr(A^1 \cap B) = \left(\frac{2}{3} \times \frac{1}{3}\right) + \left(\frac{2}{3} \times \frac{1}{3}\right) = \frac{2}{9} + \frac{2}{9} = \frac{4}{9} \quad \text{or } 0.44$$

a.ii   Let A represent the first student, B the second candidate and C the third student.
Probability of A passing the examination is Pr(A) = 2/3
Probability of A not passing the examination is Pr(A') = 1- 2/3 = 1/3
Probability of B passing the examination is Pr(B) = 2/3
Probability of A not passing the examination is Pr(B') = 1- 2/3 = 1/3
Probability of C passing the examination is Pr(C) = 2/3
Probability of C not passing the examination is Pr(C') = 1- 2/3 = 1/3
Probability that all will fail if three candidates are selected at random for the examination is

$$Pr(A' \cap B' \cap C') = \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{27} \quad \text{or } 0.037$$

aiii. Let A represent the first candidate, B the second candidate and C the third candidate.
Probability of A passing the examination is Pr(A) = 2/3
Probability of A not passing the examination is Pr(A') = 1- 2/3 = 1/3
Probability of B passing the examination is Pr(B) = 2/3
Probability of B not passing the examination is Pr(B') = 1- 2/3 = 1/3
Probability of C passing the examination is Pr(C) = 2/3
Probability of C not passing the examination is Pr(C') = 1- 2/3 = 1/3
Probability that one candidate will pass if three candidates are selected at random for the examination is
Pr(A∩B'∩C') or Pr(A'∩B∩C') or Pr(A'∩B'∩C) =

$$\left(\frac{2}{3} \times \frac{1}{3} \times \frac{1}{3}\right) + \left(\frac{1}{3} \times \frac{2}{3} \times \frac{1}{3}\right) + \left(\frac{1}{3} \times \frac{1}{3} \times \frac{2}{3}\right)$$

$$= \frac{2}{27} + \frac{2}{27} + \frac{2}{27} = \frac{6}{27} = \frac{2}{9} \quad \text{or } 0.22$$

b. i   exactly three heads

Probability of obtaining a tail Pr(T) = 1/4
Probability of obtaining a Head Pr(H) = 1 - 1/4 = 3/4
Sample space = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT}
Let A represent outcome of exactly 3 heads when three coins are tossed
A = {HHH}
P(A) = P(HHH) =   P(H) x P(H) x P(H) = 3/4 x 3/4 x 3/4 = 27/64

b. ii.   Let B represent outcome of at most two heads when three coins are tossed
P(B) = 1- P (A) = 1 - 27/64 = 37/64

b. iii. Let C represent the outcome of no head when three coins are tossed
C = {TTT}
P(C) = P(TTT) =   P(T) x P(T) x P(T) = 1/4 x 1/4 x 1/4 = 1/64

Examiner's comment

This question tests the candidates' knowledge of experimental probability with Part (b) of the question based on tossing of an irregular coin.

The question appeared popular to majority of the candidates, but the word "irregular" coin got many of them confused to the extent that a lot of them solved the problem as if it involved regular coin.

This affected their performances. 78% of the candidates attempted the question with about 48% of them obtaining 40% and above.

The pitfall identified was in their lack of understanding of an "irregular" coin.

SOLUTION 4

a. $R = 210x - 3x^2$
$R = p \times q$
$P = R/q = \dfrac{210x - 3x^2}{x} = \dfrac{x(210 - 3x)}{x} = 210 - 3x$

b.   Price elasticity of demand is $e_d = \dfrac{p}{x}\left(\dfrac{1}{\dfrac{dp}{dx}}\right)$

$p = ₦50,$
$\dfrac{dp}{dx} = -3$
$p = 210 - 3x$
$50 = 210 - 3x$
$3x = 210 - 50$

$$x = \frac{160}{3}$$

$$e_d = \frac{50}{\dfrac{160}{3}}\left(\frac{1}{-3}\right) = 50 \times \frac{3}{160} \times \frac{1}{-3} = -\frac{5}{16}$$

$$|e_d| = \frac{5}{16} = 0.3125$$

c. p $= 210 - 3x$ ....dd
   p $= 30 + 3x$ ....ss
   At equilibrium, dd $=$ ss (demand $=$ supply)
   $$210 - 3x = 30 + 3x$$
   $$210 - 30 = 3x + 3x$$
   $$180 = 6x$$
   $$\frac{180}{6} = x$$
   $$x = 30$$
   substitute $x = 30$ into dd
   p $= 210 - 3(30) = 210 - 90 = 120$

   Producer's surplus $= p_e q_e - \displaystyle\int_0^{q_e} s(q)\,dq$

   $$= 120 \text{ x } 30 - \int_0^{30} (30 + 3x)\,dx$$

   $$= 3{,}600 - \left[30x + \frac{3x^2}{2}\right]_0^{30}$$

   $$= 3{,}600 - ((30(30) + 1.5(30)^2) = 3{,}600 - 2{,}250 = 1{,}350.$$

Therefore, the company's producer's surplus is ₦1,350.

Examiner's comment

This is a Demand and Supply functions question to determine Price Elasticity of Demand at a fixed price.

About 75% of the candidates attempted the question with about 60% of them scoring marks in excess of 40%.

Majority of the candidates, who attempted the question, had difficulty in getting correct expression for the company's producers' surplus.

In addition to the above, some of them could not identify the appropriate limits for the integration involved.

SOLUTION 5

Using **VAM**

Number of feasible allocations = $m + n - 1 = 3 + 5 - 1 = 7$

	A	B	C	D	E	Supply	Row Penalties d1, d2.d3, d4.d5
Kano	[7	[10	[8	(325) [6	**(725)** [5	0	1, 1 1 2 *
Enugu	**(500)** [6	[9	**(350)** [10	[8	[7	0	1, 1 2 2 2
Lagos	[10	**(575)** [6	**(300)** [9	**(475)** [7	[8	0	1, 1 2 2 2
Demand	0	0	0	0	0	3250	
Colm/diff d1	1	3	1	1	2		
Penalties d2	1	*	1	1	2		
d3	1	*	1	1	*		
d4	*	*	1	1	*		
d5	*	*	1	1	*		

Computation of Total Transportation Cost

From	To	Quantity	Unit Cost	Total Cost (N)
Enugu	A	500	6	3000
Enugu	C	350	10	3500
Lagos	B	575	6	3450
Lagos	C	300	9	2700
Lagos	D	475	7	3325
Kano	D	325	6	1950
Kano	E	725	5	3625

Initial Total Cost   =   ₦21,550

Detailed solution is as follows:

Table 1

Regional factory	Market					Factory capacity	Row penalties
	A	B	C	D	E		
Kano	7	10	8	6	5	1050	1
Enugu	6	9	10	8	7	850	1
Lagos	10	6	9	7	8	1350	1
Market capacity	500	575	650	800	725		
Column penalties	1	3	1	1	2		

Table 2

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6	5	1050
Enugu	6	9	10	8	7	850
Lagos	10	6(575)1	9	7	8	1350 775
Market capacity	500	575 0	650	800	725	

Table 3

Regional factory	Market					Factory capacity	Row penalties
	A	B	C	D	E		
Kano	7	10	8	6	5	1050	1
Enugu	6	9	10	8	7	850	1
Lagos	10	6(575)1	9	7	8	1350 775	1
Market capacity	500	575 0	650	800	725		
Column penalties	1	-	1	1	2		

Table 4

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6	5(725)2	1050 325 0
Enugu	6	9	10	8	7	850
Lagos	10	6(575)1	9	7	8	1350 775 0
Market capacity	500	575 0	650	800	725 0	

Table 5

Regional factory	Market					Factory capacity	Row penalties
	A	B	C	D	E		
Kano	7	10	8	6	5(725)2	1050 325 0	1
Enugu	6	9	10	8	7	850 0	2 ←
Lagos	10	6(575)1	9	7	8	1350 775 0	2 ←
Market capacity	500	575 0	650	800	725 0		
Column penalties	1	-	1	1	-		

A tie occurs but smallest is cell Enugu to market A

Table 6

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6	5(725)2	1050 325
Enugu	6(500)3	9	10	8	7	850 350 0
Lagos	10	6(575)1	9	7	8	1350 775 0
Market capacity	500 0	575 0	650	800	725 0	

Table 7

Regional factory	Market					Factory capacity	Row penalties
	A	B	C	D	E		
Kano	7	10	8	6	5(725)2	1050 325 0	2 ←
Enugu	6(500)3	9	10	8	7	850 350 0	2 ←
Lagos	10	6(575)1	9	7	8	1350 775 0	2 ←
Market capacity	500 0	575 0	650	800	725 0		
Column penalties	-	-	1	1	-		

A tie occurs but since the smallest unit cost occurs in the Kano row, the allocation is done as shown in the table.

Table 8

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6(325)4	5(725)2	1050 325 0
Enugu	6(500)3	9	10	8	7	850 350 0
Lagos	10	6(575)1	9	7	8	1350 775 0
Market capacity	500 0	575 0	650	800 475	725 0	

Table 9

Regional factory	Market					Factory capacity	Row penalties
	A	B	C	D	E		
Kano	7	10	8	6(325)4	5(725)2	10~~50~~ 3~~25~~ 0	-
Enugu	6(500)3	9	10	8	7	8~~50~~ 3~~50~~ 0	2 ←
Lagos	10	6(575)1	9	7	8	13~~50~~ / 775 0	2 ←
Market capacity	5~~00~~ 0	5~~75~~ 0	650	8~~00~~ / 475	7~~25~~ 0		
Column penalties	-	-	1	1	-		

A tie occurs but smallest is cell Lagos to Market D

Table 10

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6(325)4	5(725)2	10~~50~~ 3~~25~~ 0
Enugu	6(500)3	9	10	8	7	8~~50~~ 3~~50~~
Lagos	10	6(575)1	9	7(475)5	8	13~~50~~ 7~~75~~ 3~~00~~ 0
Market capacity	5~~00~~ 0	5~~75~~ 0	650	8~~00~~ 4~~75~~ 0	7~~25~~ 0	

Table 11

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6(325)4	5(725)2	10~~50~~ 3~~25~~ 0
Enugu	6(500)3	9	10	8	7	8~~50~~ 3~~50~~ 0
Lagos	10	6(575)1	9(300)6	7(475)5	8	13~~50~~ 7~~75~~ 3~~00~~ 0
Market capacity	5~~00~~ 0	5~~75~~ 0	6~~50~~ / 350	8~~00~~ 4~~75~~ 0	7~~25~~ 0	

Final table is given as shown below:

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Table 12

Regional factory	Market					Factory capacity
	A	B	C	D	E	
Kano	7	10	8	6(325)4	5(725)2	1050 325 0
Enugu	6(500)3	9	10(350)7	8	7	850 350 0
Lagos	10	6(575)1	9(300)6	7(475)5	8	1350 775 300 0
Market capacity	500 0	575 0	650 350 0	800 475 0	725 0	

Transportation cost for the initial allocation is worked out as follows:

Route From	To	Unit Shipped	x Cost per unit (₦)	=	Total Cost (₦)
Enugu	Market A	500	6	=	3000
Enugu	Market C	350	10	=	3500
Kano	Market D	325	6	=	1950
Kano	Market E	725	5	=	3625
Lagos	Market B	575	6	=	3450
Lagos	Market C	300	9	=	2700
Lagos	Market D	475	7	=	3325
					21,550

Therefore, the initial basic feasible total cost of transportation equals ₦21,550.

Examiner's comment

Transportation problem using the Vogel's Approximate method to calculate the initial basic feasible total cost of the transportation. About 85% of the candidates attempted the question with about 70% of the candidates' scoring marks in excess of 40%.

The major difficulty or pitfall identified was the inability of the candidates to identify both the row and column penalty factors. Some of the candidates that attempted the question could not go beyond 3 iterations to obtain their basic cost which was wrong. To get the correct initial basic feasible total transportation cost, five iterations are needed.

SOLUTION 6

Table 1

		Executive Managers				
		1	2	3	4	5
Portfolios	A	90	80	70	130	80
	B	95	83	71	137	83
	C	80	71	62	119	74
	D	85	77	65	125	77
	E	81	69	61	117	73

Since it is a Maximization assignment problem, the highest proceed is ₦137,000, therefore all the proceeds will be subtracted from this value to result in the table below:

Table 2

		Executive Managers				
		1	2	3	4	5
Portfolios	A	47	57	67	7	57
	B	42	54	66	0	54
	C	57	66	75	18	63
	D	52	60	72	12	60
	E	56	68	76	20	64

Subtract the lowest entry in "each row" of the proceed table from all entries in that "row" to get the table below:

Table 3

		Executive Managers				
		1	2	3	4	5
Portfolios	A	40	50	60	0	50
	B	42	54	66	0	54
	C	39	48	57	0	45
	D	40	48	60	0	48
	E	36	48	56	0	44

Subtract the lowest entry in "each column" of the proceed table obtained above from all the entries in that "column".

Table 4

		Executive Managers				
		1	2	3	4	5
Portfolios	A	4	2	4	0	6
	B	6	6	10	0	10
	C	3	0	1	0	1
	D	4	0	4	0	4
	E	0	0	0	0	0

Number of lines drawn horizontally or vertically through the total opportunity proceed table in such a manner as to minimize the number of lines necessary to cover all zero cells is three. Hence, pick the smallest number in the above table that is not covered by all straight lines and subtract this number from all numbers not covered by a straight line and add the same lowest number to the number lying in the intersection of any two lines and then draw lines horizontally or vertically in such a manner so as to minimize the number of lines necessary to cover all zero cells is the resulting table as given below

Table 5

		Executive Managers				
		1	2	3	4	5
Portfolios	A	3	2	3	0	5
	B	5	6	9	0	9
	C	2	0	0	0	0
	D	3	0	3	0	3
	E	0	1	0	1	0

Number of lines drawn horizontally or vertically through the total opportunity proceed table in such a manner as to minimize the number of lines necessary to cover all zero cells is four, hence, pick the smallest number in the above table that is not covered by all straight lines and subtract this number from all numbers not covered by a straight line and add the same lowest number to the number lying in the intersection of any two lines and then draw lines horizontally or vertically in such a manner as to minimize the number of lines necessary to cover all zero cells is the resulting table as given below.

Table 6

		Executive Managers				
		1	2	3	4	5
Portfolios	A	1	0	1	0	3
	B	3	4	7	0	7
	C	2	0	0	2	0
	D	3	0	3	2	3
	E	0	1	0	3	0

Number of lines drawn horizontally or vertically through the total opportunity proceed table in such a manner as to minimize the number of lines necessary to cover all zero cells is four, hence, pick the smallest number in the above table that is not covered by all straight lines and subtract this number from all numbers not covered by a straight line and add the same lowest number to the number lying in the intersection of any two lines and then draw lines horizontally or vertically in such a manner so as to minimize the number of lines necessary to cover all zero cells is the resulting table as given below

Table 7

		Executive Managers				
		1	2	3	4	5
Portfolios	A	0	0	0	0	2
	B	2	4	6	0	6
	C	2	1	0	3	0
	D	2	0	2	2	2
	E	0	2	0	4	0

Note that an optimal assignment is made when the number of lines is equal to the number of rows or columns. Row D has only one zero, so we assign investment portfolio D to Executive manager 2. Row B has only one zero, so. we assign investment portfolio B to Executive manager 4. Investment C or E can be assigned to Executive manager 3 or 5 (whichever way, the maximum total proceeds will be the same). It is obvious that investment portfolio A can be assigned to Executive manager 1 (note that if investment portfolio A is assigned to Executive manager 3, then investment portfolios C and E can be assigned to Executive managers 1and 5) However maximum total proceeds will remain the same. Hence, the assigned portfolios are shown as follows:

Portfolios	Executive Managers	Proceeds
A	→ 1 →	₦90,000
B	→ 4 →	₦137,000
C	→ 3 →	₦62,000
D	→ 2 →	₦77,000
E	→ 5 →	₦73,000

a. The total proceeds of all the executive managers from the investment portfolios is
= ₦90,000 + ₦137,000 + ₦62,000 + ₦77,000 + ₦73,000 = ₦439,000

Or

Portfolios	Executive Managers	Proceeds
A	→ 3 →	₦70,000
B	→ 4 →	₦137,000
C	→ 5 →	₦74,000
D	→ 2 →	₦77,000
E	→ 1 →	₦81,000

b. The total proceeds of all the executive managers from the investment portfolios is
= ₦70,000 + ₦137,000 + ₦74,000 + ₦77,000 + ₦81,000 = ₦439,000

Examiner's comment

This is an Assignment or Allocation problem using the Hungarian method. About 58% of the candidates attempted the question with about 68% of them obtaining marks in excess of 40%.

The Major pitfall of the candidates was their inability to know that in a maximisation problem, the highest proceed should be identified from which all the proceeds should be subtracted to result in the initial working table.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA
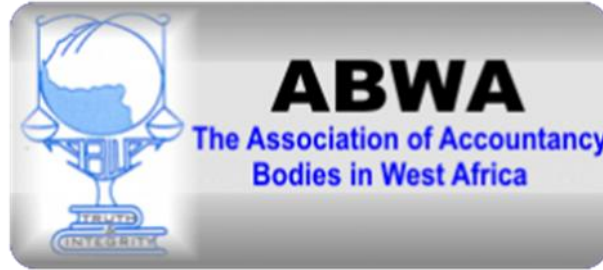
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
SEPTEMBER 2024 EXAMINATIONS (PART II)

INFORMATION TECHNOLOGY

PLEASE READ THESE INSTRUCTIONS BEFORE COMMENCEMENT OF THE PAPER

EXAMINATION INSTRUCTIONS

1. All solutions should be in ink. Any solution in pencil will not be marked.

2. Read all instructions on each part of the paper carefully before answering the questions.

3. Ensure that you do not answer more than the number of questions required for **Section B (The Essay Section).**

4. Check your pockets, purse and mathematical sets, etc to ensure that you do not have prohibited items such as telephone handset, electronic storage device, wrist watches, programmable devices or any form of written material on you in the examination hall. You will be stopped from continuing with the examination and liable to further disciplinary actions including cancellation of examination result if caught.

5. Do not enter the hall with anything written on your docket.

6. Insert your examination number in the space provided above.

TUESDAY, SEPTEMBER 24, 2024

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO

ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA
ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
PART II EXAMINATIONS – SEPTEMBER 2024

INFORMATION TECHNOLOGY

Time Allowed: 3 hours

SECTION A: PART I   MULTIPLE-CHOICE QUESTIONS   (30 MARKS)

ATTEMPT ALL QUESTIONS IN THIS SECTION

Write ONLY the alphabet (A, B, C, D or E) that corresponds to the correct option in each of the following questions/statements.

1. Which part is used to represent the host computer in the following IP Address? 192.168.1.25

   A. 192
   B. 168
   C. 1
   D. 25
   E. 192.168

2. Convert 443_{10} to the binary equivalent.

   A. 110111011_2
   B. 110101011_2
   C. 100111011_2
   D. 110111010_2
   E. 110111001_2

3. Which of the following is **NOT** an example of Utilities tools?

   A. Compression tools
   B. Disk clean-up tool
   C. Database Management System
   D. File Management System
   E. Disk Defragmenter

4. Which of the following is **NOT** an example of application software?

   A. PowerPoint
   B. Photoshop
   C. Skype
   D. Firefox
   E. Window 10

5. Cathode Ray tube is a form of

   A. CPU
   B. Keyboard
   C. Mouse
   D. Monitor
   E. Motherboard

6. Which of the following is **NOT** a reason for changing an information system?

   A. New technologies
   B. Staff laziness
   C. Changes in business requirements
   D. Problems in the existing system
   E. Lack of support for the existing systems

7. The stage in system development life cycle which allows companies to evaluate and verify that a software product or application does what it is supposed to do is called

   A. Planning
   B. Designing
   C. Developing
   D. Testing
   E. Deploying

8. The mistake committed by interchanging two digits in a numeric field during data entry is called

   A. Administration error
   B. Beta testing error
   C. Transcription error
   D. Transposition error
   E. Translation error

9. JPEG is an acronym for

   A. Joint Photographic Environmental Group
   B. Joint Photographic Extension Group
   C. Joint Photographic Experimental Group
   D. Joint Photographic Experts Group
   E. Joint Philosophical Experts Group

10. The different parts that the screen is divided are called

    A. Units
    B. Rows
    C. Frames
    D. Cells
    E. Columns

11. Which layer is TCP in OSI model?

    A. Physical Layer
    B. Data Link Layer
    C. Network Layer
    D. Transport Layer
    E. Session Layer

12. Which of the following is **NOT** an example of Optical Storage Media?

    A. CD-ROM devices
    B. DVD devices
    C. Magnetic tapes
    D. Blue Ray
    E. Flash drives

13. A word, phrase, or image that you can click on to jump to a new document or a new section within the current document is

    A. Tag
    B. An attribute
    C. Hyperlink
    D. List
    E. Html

14. Which of the following storage units is the largest?

    A. Gigabyte
    B. Megabyte
    C. Petabyte
    D. Terabyte
    E. Kilobyte

15. A data element in a record, that uniquely distinguishes the record from all other records, is called

    A. Field
    B. Number
    C. Key
    D. Unique
    E. Button

16. Which of the following is **NOT** a valid domain name?

    A. www.yahoo.com
    B. www.yahoo.co.uk
    C. www.tcl.com.ng
    D. www.bigstuff.cornell.edu
    E. name@hotmailcom

17. The device in a computer network that connects other devices together is

    A. Hub
    B. Scanner
    C. Switch
    D. Router
    E. Modem

18. The process of erasing the hard drive and reinstalling the operating system and all other applications and files on it is called

    A. Formatting
    B. Disk cleaning
    C. Operating System
    D. Filesystem Installation
    E. System maintenance

19. A logical division of a hard disk that is treated as a separate unit by operating systems and file systems is called

    A. Compression
    B. Partitioning
    C. Disc cleaning
    D. Cloning
    E. Fragmentation

20. The name of basic program used in android operating system is

    A. Windows
    B. Linux
    C. QNX
    D. Microsoft windows
    E. IOS

21. .... is a terminal device that broadcasts data to every computer or Ethernet-based device connected to it

    A. Switch
    B. Hub
    C. Scanner
    D. Router
    E. Modem

22. A computer network that covers larger geographical areas that can span the globe is known as

 A. LAN
 B. MAN
 C. WAN
 D. PAN
 E. CAN

23. Which protocol is used to assign IP address automatically to computers in a Network?

 A. TCP/IP
 B. SSH
 C. SMB
 D. POP
 E. DHCP

24. .... is a security system designed to prevent unauthorised access into or out of a computer network

 A. Firewall
 B. Protocol
 C. Password
 D. Username
 E. Filter

25. .... is a query language used to communicate with databases

 A. C++
 B. Java
 C. SQL
 D. MYSQL
 E. String

26. .... is DBMS for handling Big Data.

 A. MYSQL
 B. SQO
 C. Oracle
 D. Hadoop
 E. Postgres

27. Which of the following is **NOT** an Internet protocol?

 A. TCP
 B. STP
 C. UDP
 D. POP
 E. SMTP

28. Which of the following is **NOT** a programming language?

    A. JavaScript
    B. SQL
    C. Python
    D. Java
    E. C++

29. The functional key on the keyboard to rename a highlighted file or icon is

    A. F1
    B. F3
    C. F7
    D. F5
    E. F2

30. The speed of your internet access is defined in terms of

    A. RAM
    B. MHz
    C. Mbps
    D. Bytes
    E. Seconds

SECTION A: PART II   SHORT ANSWER QUESTIONS   (20 MARKS)

ATTEMPT ALL QUESTIONS

Write the correct answer that best completes each of the following questions/statement

1.   .... refers to the maximum amount of data that can travel along communications path in a given time, usually measured in seconds.

2.   .... is an organisation's strategy or policy that allows employees to use their own personal devices for work purposes.

3.   A collection of computers, printer, scanner, and peripheral devices connected by a medium is called ....

4.   A physical facility that organisations use to house their critical applications and data is called..................

5.   ....is a computational power to automatically enter a huge number of combination of values, usually in order to discover passwords and gain access

6.   A software application which presents information and services from the web is known as ....

7.   .... is the process of converting information into a digital format

8.   Applying updates to firmware or software to improve security and/or enhance functionality is known as ....

9.   ....is the method by which users' access and save or "pull down" software or other files to their own computers from a remote computer via the Internet.

10.   A channel for communicating across a boundary between two or more subsystems is known as ....

11.   A facility that allows the user to speak into a special device while typing a letter using a computer is called ....

12.   The practice of checking the integrity, accuracy and structure of data before it is used for a business operation is called ....

13.   The process of development of methical information technology specifications, models and guidelines is called.................

14.   ....is a process that copies all your files, data and information to effectively create two versions – one on your original devices and one backup.

15.   A collection of people, machines, and methods organised to accomplish a set of functions is called.......................

16. The process of planning, system analysis, system design, development, implementation, integration and testing, and operations and maintenance is known as*...................................*

17. *.........* is a form of user interface that allows users to interact with electronic devices through graphical icons

18. Untargeted mass emails sent to many people asking for sensitive information (such as bank details) or encouraging them to visit a fake website is known as *.........................*

19. *..............* is a company that provides access to the Internet.

20. A private network that enterprises use to provide trusted third parties such as suppliers, vendors, partners, customers and other businesses secure, controlled access to business information or operations is called *...............*

SECTION B: ATTEMPT ANY FOUR QUESTIONS   (50 MARKS)

QUESTION 1

a.   What is open-source software in software licencing?   (2 Marks)
b.   Describe **FOUR** characteristics of open source software   (8 Marks)
c.   List **FIVE** examples of web browser software   (2½ Marks)

QUESTION 2

a.   What is a backup?   (2½ Marks)
b.   Describe **THREE** types of backups   (3 Marks)
c.   List **THREE** examples of Server Operating Systems   (3 Marks)
d.   Describe **FOUR** types of cyber- security threats to computer systems   (4 Marks)

QUESTION 3

a.   What is a search engine?   (2½ Marks)
b.   List **THREE** examples of search engines   (3 Marks)
c.   Describe **THREE** features of a mainframe computer   (3 Marks)
d.   List and describe **FOUR** methods of virus detection in computer systems
(4 Marks)

QUESTION 4

a.   What is a cache memory?   (2½ Marks)
b.   Describe **TWO** advantages of cache memory   (2 Marks)
c.   List and describe **FOUR** examples of Application Software that can assist users in regular office jobs.   (4 Marks)
d.   State **FOUR** advantages of using an email   (4 Marks)
(Total 12½ Marks)

QUESTION 5

a. State **THREE** examples of email provider   (2½ Marks)
b. List **FOUR** types of Networks   (4 Marks)
c. List and describe **FOUR** examples of number systems in computer system
                                                                 (6 Marks)
                                                    (Total 12½ Marks)

QUESTION 6

a. What is an Interface?   (2½ Marks)
b. Describe **FOUR** types of User Interfaces   (4 Marks)
c. State **THREE** devices that can perform both input & output (I/O) operations
    in a computer system   (3 Marks)
d. List **THREE** examples of Relational Databases   (3 Marks)
                                                    (Total 12½ Marks)

SECTION A: PART I

MULTIPLE CHOICE QUESTIONS (MCQ)
SOLUTIONS

1) D
2) A.
3) C
4) E
5) D
6) B
7) D
8) D
9) D
10) C
11) D
12) C
13) C
14) C
15) C
16) E
17) C
18) A
19) B
20) B
21) B
22) C
23) E
24) A
25) C
26) D
27) B
28) B
29) E
30) C

Examiner's comment

This part consists of thirty (30) compulsory questions drawn from the entire syllabus. All the candidates attempted the questions, and the performance is far above average.

SECTION A: PART II

SHORT ANSWER QUESTIONS

1) Bandwidth
2) Bring your own device (BYOD)
3) Networking/Network
4) Data center
5) Brute force attack
6) Browser/Web browser
7) Data digitization
8) Patching
9) Downloading
10) Interface
11) Dictaphone
12) Data Verification
13) Information technology architecture
14) Back-up
15) System
16) Systems development life cycle
17) Graphical User Interface (GUI)
18) Phishing
19) Internet service provider (ISP)
20) Extranet

Examiner's comment

This part consists of twenty compulsory questions, and it covers the entire syllabus. this part demands for short answers to each question. Most of the answers are technical IT terms and the performance is very poor.

Candidates are advised to familarise themselves with IT terms.

SECTION B:

SOLUTION 1

a. **Open-source software** is software with source code that anyone can inspect, modify, and enhanced. It is a software developed and the author release both the software and the source code so that a user can learn and edit the source code when the need arises. This means that programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.

b. **Characteristics of Open-Source Software:**
   i. **Innovation:** It facilitates more rapid innovation as it encourages the sharing of resources and information that in turn support more technical development. Such software encourages the collaboration of ideas, resources, and data which has contributed to many of the most essential technological developments of our generation.

   ii. **Freedom:** It is a platform where programmers are provided with freedom at no substantial cost. It allows organizations and programmers to operate and use the source code in whatever way they want. Users can study the software and curate it according to their requirement for more effective computing.

   iii. **Integrity:** With open-source software, organizations have the liberty to analyze the code and make changes to it by adding security-based codes to the software.

   iv. **Large user community:** The users of open-source software have a large user community who collectively identify and tackle any issues or security vulnerabilities in the software with the help of beta testers for a safer experience.

   v. **Continuity:** Open-source software is more efficient and performs better in business continuity by being readily available and accessible. Companies do not have to delay operations to construct and code software from scratch, which saves time and cost, while enhancing employees' effectiveness.

   vi. **Licensing flexibility:** It always comes with document that indicates how the software can be used, modified and distributed based on the specific license terms

   vii. **Cost effectiveness:** It reduces the cost of ownership compared to proprietary software

   viii. **Transparency:** The availability of the source code ensures transparency, allowing users to understand how the software works, what it does, and to verify the security and functionality of the code.

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c. **Examples of Web browser software include:**
   i. Mozilla Firefox,
   ii. Brave
   iii. Internet Explorer
   iv. Google Chrome
   v. Opera
   vi. Safari
   vii. Microsoft Edge
   viii. Tor Browser

Examiner's comment

This question tests the candidates' knowledge on Open-source Software. It demands for its characteristics and examples of Web Browser Software.

Majority of the candidates did not attempt this question. Only about 30% of those that attempted it scored above 50% of the allotted mark.

The major pitfall is the inability to critically explain Open-source Software licence.

The few scores obtained are attempts to give the characteristics. Most of the candidates are used to at least one web browser.

Candidates are advised to get familiar with more Web browsers and know the exact meaning of Open-Source Software.

SOLUTION 2

a) Computer backup is a process that copies all files, data and information to effectively create two versions – one on the original devices and another copy on devices outside the system. It is designed to protect all important files and pictures, in case of any mishap, accident or eventualities.

b) **Types of Backups include:**
   i. Full backup

   The full backup is the starting point for all other types of backups and contains all the data in the folders and files that are selected to be backed up

   ii. Differential backup
   The differential backup contains all files that have changed since the last FULL backup.

   iii. Incremental backup
   Incremental backup stores all files that have changed since the last FULL, DIFFERENTIAL OR INCREMENTAL backup.

   iv. Mirror backup
   The mirror backup is identical to a full backup, with the exception that the files are not compressed in zip files, and they cannot be protected with a password. A mirror backup is most frequently used to create an exact copy of the source data.

   v. Local Backup
   This is when data is stored on physical storage devices such as hard drive, flash drive etc.

   vi. Cloud Backup
   This is when data is backed up to remote cloud storage services which is very convenient and accessible from anywhere once there is access to the internet.

c) **Examples of Server Operating System Include:**
   1. Windows Server
   2. Linux
   3. Red Hat Enterprise Linux (RHEL)
   4. UNIX-Based Operating Systems
   5. NetWare
   6. MacOS Server
   7. FreeBSD

d) **Types of cyber security threats to computer systems:**
   a. Hacking and cracking:
   This is a method of cleverly or intentionally breaking the code of a legal

user in order to gain access to vital information.

b. Virus introduction:
This is a method of intentional/fraudulently inserting a program code into existing program, systems or network to make them malfunction.

c. Phishing:
This is when criminals deceive unsuspecting individual into providing sensitive information by masquerading as legitimate organization most especially through emails.

d. Ransomware:
This is when a criminal encrypts a victim's data and demand payment of ransom before access to the data can be restored.

e. Eavesdropping:
This is when criminals intercept conversation and begging to extract or listen to the conversation without the knowledge of the sender and the receiver.

f. Rootkits:
This refers to the use of malicious tools that allow attackers to gain root or administrators access to a system and hide their activities.

g. Email forgery:
This refers to sending an email message to look as if it was sent by a known sender.

h. Cracking:
This is when criminals have unauthorized access to a system through a telecommunication network for malicious intention.

i. Man in the middle
j. Denial of service
k. Password attack
l. Crypto jacking

Examiner's comment

This question tests candidates' knowledge on the familiar concept of Backup. It demands for the types of backups, examples of Server Operating Systems and types of Cyber-Security threats.

The concept of Backup is very familiar with the candidates and many candidates attempted it and the performance is very encouraging as 70% of the candidates

that attempted it scored over 50% of the allotted mark.

The major pitfall is the inability to state the types of Backups. Many candidates are familiar with Windows, Linus and Unix as Server OS. All the candidates are familiar with cyber-security threats.

This is a good question for the candidates.

Details for future examinations can be found in ICAN Study Text.

SOLUTION 3

a. **Search engine**

A search engine is a software system designed to carry out web searches. They search the World Wide Web in a systematic way for particular information specified in a textual web search query.

b. **Examples of Search Engines include:**
   1. Google.
   2. Bing.
   3. Yahoo.
   4. Baidu
   5. AOL
   6. Ask.com
   7. Excite.
   8. DuckDuckGo
   9. Smartpage

c. **Features of mainframe computers include:**
   1. Size
   2. Large Memory
   3. High Processing Speed
   4. Enhance centralized Processing
   5. Enhance Multiprocessing
   6. Scalability
   7. Security
   8. Multiusers System
   9. Compatibility
   10. Enhance Cache Memory
   11. Durability
   12. Reliability, availability and Serviceability
   13. Multiprogramming
   14. Emit much heat
   15. Housed in air-conditioned environment

Description:
   1. Size: it is very big in size, bigger than Minicomputers but smaller than the super computer.

2. Large Memory Capacity: It has a large amount of memory capacity to store large amount of data.

3. High processing Speed: It is capable of processing large volume of transactions within a very short period of time.

4. Enhance Centralised processing by allowing multiple users to have access to and process their data simultaneously.

5. Enhance multiprocessing by allowing multiple processors to process data at the same time.

6. Scalability: This helps companies using them to manage additional resources within the available infrastructure.

7. Security: It is designed to support high level of security such as data encryption and very strong access control.

8. It is a multiuser system allowing several users to work on it concurrently.

9. Compatibility: It has the ability to work with other systems that work with similar applications.

10. Cache memory: it contains cache memory with high capacity and high storage for operation between the processor and the memory.

11. Durability: It is designed in such a way that it can last for a very long time with regular maintenance.

12. Reliability, Availability and Serviceability (RAS) which makes the system unique from other categories of computers.

13. Multiprogramming: It enables programs to be sub-divided into tasks and executed simultaneously.

14. Emit large quantity of heat during operation

15. It is always kept in an air-conditioned environment during operation.

d. **Methods of virus detection in computer systems include:**
   i. **Installation of original antivirus software** such as Norton Anti-Virus, Avast, McAfee Virus scan, Kaspersky Anti-virus, Panda anti-Virus, AVG Anti-virus, Bitdefender etc.

   ii. **Sandboxing:** This a method of isolating suspicious files in a secure environment to analyse their behavior so as to determine whether the files are infected by virus or not.

   iii. **Signature-based detection:** This has to do with detecting viruses by scanning for known virus signatures or patterns in files.

   iv. **Behavioural-based detection:** This involves monitoring the real-time behavior of programs to detect any suspicious activity that could indicate a virus.

    v. **Realtime based scanning:** This refers to continuous scanning of files as they are accessed so that virus infected files can be detected immediately.

    vi. **Network Traffic Analysis:** This is when network traffic is being monitored to detect unusual activity that may indicate virus infection.

    vii. **Interception:** Interception software detects virus-like behavior and warns the user about it.

Examiner's comment

This question tests the candidates' knowledge on the Search Engines, features of mainframe computers and methods of virus detection in computer systems.

Like Web Browsers, Search Engines is a very familiar concept in IT.

Over 70% of the candidates attempted this question and the performance is above average as over 60% of those that attempted the question score over 60% of the allotted mark.

Most candidates are familiar with the features of the mainframe and methods of virus detection.

The major pitfall is that most candidates could not give correct examples of Search Engines.

For future examinations, candidates are advised to give examples and distinguish between Search Engines and Web browsers.

SOLUTION 4

a. **Cache memory:** It is a temporary storage that lies in between the main memory and the processor and stores frequently used data or commands. It is a high-speed memory that can keep up with processing speed of the computer processor so that the processor is not delayed by memory accesses thereby increasing the speed of processing

b. **Advantages of cache memory include:**
    i. It increases the computer processing speed
    ii. It acts as a buffer between the primary memory and the processor
    iii. It improves the performance of the system
    iv. It is very efficient in handling repeated access to the same data
    v. It consumes less power compared to fetching data from the main memory

c. **Examples of Application Software that can assist users in regular office jobs include:**

    1. **Word Processing Software:** Microsoft Word: A powerful word processor with features for creating, editing, and formatting text documents, including

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templates and collaboration tools.

2. **Spreadsheet Software:** Microsoft Excel: A widely used spreadsheet application that provides tools for data analysis, visualization, and complex calculations.

3. **Presentation Software:** Microsoft PowerPoint: A popular presentation software used to create slide shows that include text, images, videos, and animations.

4. **Email Clients:** Microsoft Outlook: An email client that integrates email, calendar, tasks, and contacts, providing a comprehensive tool for office communication and organization.

5. **Google Gmail:** A web-based email service known for its robust filtering and organization capabilities, integrated with other Google services.

6. **Project Management Software:** Microsoft Project: A project management software designed for project planning, scheduling, and resource management.

7. **Database Management Software:** Microsoft Access: A desktop database management system that allows users to create and manage databases, suitable for smaller-scale applications.

8. **Note-Taking Applications:** Microsoft OneNote: A digital notebook for capturing and organizing notes, drawings, and audio recordings, integrated with other Microsoft Office applications.

9. **Collaboration Tools:** Microsoft Teams: A collaboration platform that integrates chat, video meetings, and file sharing, designed for teamwork and project management.

10. **Zoom:** A video conferencing tool that allows for virtual meetings, webinars, and collaboration with screen sharing features.

11. **Browsers:** A software application which presents information and services from the web.

12. **Graphic Software:** Refers to a program or collection of programs that enables a person to manipulate images or models visually on a computer.

d. **Advantages of using e-mail include:**
   i. Emails are easy to use to organize daily correspondence, send and receive electronic messages and save them on computers.

   ii. Emails are fast. They are delivered at once around the world. No other form of written communication is as fast as an email.

iii. The language used in emails is simple and informal.

iv. When replying to an email one can attach the original message which enables the recipient to know what one is talking about. This is important if one gets hundreds of emails a day.

v. It is possible to send automated emails with a certain text. In that way it is possible to tell the sender that one is on vacation. These emails are called auto responders.

vi. Emails can also have pictures in them. One can send birthday cards or newsletters as emails.

vii. Products can be advertised with emails. Companies can reach a lot of people and inform them in a short time.

viii. Emails do not use paper.

Examiner's comment

This question tests the candidates' knowledge on the concept of cache memory, Application software and Emails.

These are familiar concepts to most candidates as over 60% of those that attempted the question scored 50% of the allotted mark.

The major pitfall is the inability to properly explain Cache memory as against ordinary buffer memory.

For further examinations, candidates should lay more emphasis on the exact property of Cache memory.

SOLUTION 5

a) **Examples of email clients include:**

1. Gmail
2. Yahoo! Mail
3. Microsoft Outlook
4. Mozilla Thunderbird
5. MacOS Mail
6. IncrediMail
7. Mailbox
8. iOS Mail
9. Postbox
10. Apple Mail
11. Proton Mail
12. Web Mail

b) Types of Networks include:

1. Personal Area Network (PAN)
2. Local Area Network (LAN)
3. Wireless Local Area Network (WLAN)
4. Campus Area Network (CAN)
5. Metropolitan Area Network (MAN)
6. Wide Area Network (WAN)
7. Storage-Area Network (SAN)
8. Intranet
9. Extranet
10. Virtual Private Network (VPN)
11. Distributed Network

c) Examples of number system in computer include:

1. Binary Number System (Base 2)
2. Decimal Number System (Base 10)
3. Octal Number System (Base 8)
4. Hexadecimal Number System (Base 16)
5. BCD (Binary-Coded Decimal)
6. Base 128 or LEB 128
7. Base 256
8. Any base of the form 2^n, where n is a positive integer.

Explanation:
1. **Binary Number System (Base 2)**
   It is a number system that uses only two digits, 0 and 1. It is a fundamental number system for computers, as digital circuits operate using binary states (on/off).
   Example: The binary number 1010 represents the decimal number 10.

2. **Decimal Number System (Base 10):**
   It is a number system that uses ten digits, from 0 to 9 and it is a standard number system used in everyday life and arithmetic.
   Example: The decimal number 50 is the same 50 in decimal.

3. **Octal Number System (Base 8):**
   The Octal number system uses eight digits, from 0 to 7. It is occasionally used in computing as a shorthand for binary (each octal digit corresponds to three binary digits).
   Example: The octal number 17 represents the decimal number 15 (1×8^1 + 7×8^0).

4. **Hexadecimal Number System (Base 16): It uses sixteen symbols, from 0 to 9** and A to F (where A = 10, B = 11, C = 12, D = 13, E = 14, F = 15).
   It is mostly used in programming and computer science to represent binary data more compactly, such as in color codes and memory addresses.

Example: The hexadecimal number 1A represents the decimal number 26 ($1\times16^1 + 10\times16^0$)

5. **BCD (Binary-Coded Decimal):** In this number **system** each digit of a decimal number with itsbinary equivalent and it is used in digital systems where precision is important, such as financial applications.
   Example: The decimal number 93 is represented in BCD as 1001 0011 (9 as 1001 and 3 as 0011).

6. **LEB 128 (Base 128):** Base 128 known as LEB 128 that is little Endian Base 128 is a form of variable – length code compression used to store an arbitrarily large integer in a small number of bytes.

7. **Base 256**

Examiner's comment
This question tests candidates' knowledge on the concepts of email providers, types of Networks and number systems in computer systems.

This is a very popular concept in IT as over 70% of the candidates attempted the question and the performance is very encouraging as over 70% of those that attempted the question scored over 60% of the allotted mark.

The types of networks and the number systems in computer systems are familiar and easy concepts.

SOLUTION 6

a. Interface can be defined as a point of interaction between different systems, components, or users. It describes various methods and protocols for communication to facilitate exchange of information or functionality.

b. **Types of user interface include:**

1. **Graphical User Interface (GUI):**
   It is an interface that allows the user to interact with the computer by clicking on graphics called icon and any icon clicked will send appropriate command to the computer and the computer will obey. It can also be defined as a visual interface that allows users to interact with the system using graphical elements like windows, icons, buttons, and menus.

   Examples:
   - Windows, macOS, and Linux desktop environments.
   - Mobile operating systems like iOS and Android.

2. **Command Driven Interface:**
   It is an interface that allows the user to operate or interact with the computer through the use of commands. It can also be described as a text-

based interface that allows users to interact with the system by typing commands into a terminal or command prompt.

Examples:
- MSDOS – Microsoft Disk Operating System
- PCDOS – Personal Computer Disk Operating System
- Command Prompt and PowerShell in Windows.

3. Touch User Interface:
It is an interface that allows users to interact directly with the screen using touch gestures such as tapping, swiping etc. It is commonly used with smartphones, tablets, and touch-enabled laptops.

Examples:
- Mobile apps on iOS and Android devices.
- Touchscreen interfaces in kiosks and ATMs.

4. Voice User Interface (VUI):
It is an interface that allows users to interact with the system through voice commands and speech recognition. It does not require the use of hand to interact with the system.

Examples:
- Google Assistant
- Voice-activated commands in smartphones and smart home devices.

5. Natural Language User Interface (NUI):
This interface enables users to interact with the system using natural language, whether spoken or typed. Focuses on understanding user intent and context as well as including machine learning to improve interactions over time.

Examples:
- Chatbots
- Natural language processing applications.
- Conversational agents on websites.

6. Menu-Driven Interface:
This interface presents users with a series of menus to navigate and select options. It is common in systems where users may not be familiar with command syntax, and it makes it simple for users by providing predefined options where users can pick

Examples:
- Geographic Information System Interface
- Automated Teller Machine interfaces.
- Global Positioning System Interface

7. Form-Based Interface:

This interface allows users to input data into fields arranged in a structured format, mostlyusing forms. This interface is useful for data entry and structured information collection.

Examples:

- Online registration forms, survey applications, and database input forms.

8. Web User Interface:

This is a specialized type of Graphical User Interface that is accessed via a web browser and is designed for web applications. It utilizes web technologies like HTML, CSS, and JavaScript.

Examples:

Websites and web applications such as Google Docs, online banking

c. **Devices that can perform input-output operations in computer include:**
   - (i)   Monitor (touch screen monitor)
   - (ii)   Flash drive
   - (iii)   Compact Disk
   - (iv)   Floppy disk
   - (v)   Webcam for both visual input and output
   - (vi)   External hard drive
   - (vii)   Magnetic disk
   - (viii) Game console controller
   - (ix)   Network interface card
   - (x)   Modems
   - (xi)   Headsets: (Headset consists of speakers and microphone, speaker act as output device while microphone act as input device)
   - (xii)   Facsimile (FAX): it has scanner to scan the document and also have printer to print the document.

B. **Examples of Relational Database include:**
   - i.   MySQL
   - ii.   Oracle Database
   - iii. Microsoft SQL Server
   - iv.   IBM (Db2) International Business Machine Database 2
   - v.   Microsoft Access
   - vi.   Postgres

Examiner's comment

The question tests candidates' understanding of User interfaces, I/O operations and relational databases in computer science.

It demands for the types of interfaces and examples of devices that perform I/O operations.

Only few candidates attempted this question, and the performance is very poor as less than 40% of those that attempted the question scored less than 30% of the allotted mark.

The major pitfalls are the inability to give examples of interfaces and I/O devices. For further examination, candidates should consult ICAN study pack.