AT/212/PII.5

## THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA



## ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA SEPTEMBER 2021 EXAMINATIONS (PART II)

## **PRINCIPLES AND PRACTICE OF 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 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.

## TUESDAY, 28 SEPTEMBER, 2021

## 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 2021

## **PRINCIPLES AND PRACTICE OF FINANCIAL ACCOUNTING**

#### 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. Which of the following is issued by the seller when goods bought on credit are returned?
  - A. Debit note
  - B. Credit note
  - C. Credit invoice
  - D. Goods return note
  - E. Bill of exchange
- 2. A company with an authorised share of №1.00 each, issued the shares at a price of №1.20 per share.

The discount or premium per share is

- A. Discount of 80kobo per share
- B. Premium of 80kobo per share
- C. Premium of 20kobo per share
- D. Discount of 20kobo per share
- E. Premium of **\1.10** per share

## 3. Alice Ventures Limited has the following information;

Opening Inventory - Le 370, 000 Closing Inventory - Le 260, 000 Cost of inventory sold - Le 3, 307, 500 The annual rate of inventory turnover is ...... times

- A. 12.7
- B. 11.5
- C. 10.5
- D. 9.5
- E. 5.3

- 4. Dividends received by a company from another company should be treated in its statement of cash flows as
  - A. Cash and cash equivalent
  - B. Non-cash transaction
  - C. Financing activities
  - D. Investing activities
  - E. Operating activities
- 5. Which of the following is **NOT** a feature of property, plant and equipment (PPE)?
  - A. They are used for production of goods & services
  - B. They have useful life of more than one year
  - C. They are non-current assets
  - D. They are free from any encumbrances
  - E. They are acquired not for resale
- 6. Which of the following is **NOT** an item under liabilities?
  - A. Accruals
  - B. Long term debt
  - C. Recoverable tax
  - D. Provisions
  - E. Creditors

## Use the following information to answer questions 7-9

The Trial Balance extracted from the books of Lockdown Enterprises as at 31, December 2019 includes the following balances:

Trade Receivables ¥1,200,000; Provision for Doubtful Debts ¥25,000.

## Additional Information:

Bad Debts to be written off \$5,000 and provision for Doubtful Debts is to be 3% of good Trade Receivables.

- 7. What is the value of provision for Doubtful Debts for the year ended 31 December 2019?
  - A. ₩35,850
  - B. ₩25,850
  - C. ₩20,850
  - D. ₩10,850
  - E. **№**10,800

- 8. What is the value of Trade Receivables to be reflected in the statement of Financial Position as at 31 December 2019?
  - A. ₩1,159,150
  - B. ₩1,059,150
  - C. ₩1,059,000
  - D. ₩1,057,000
  - E. ₩1,037,150
- 9. The necessary journal entries required to write-off the Bad Debts from the books of Lockdown Enterprises for the year ended 31 December 2019 is
  - A. Dr. Bad Debts Account
  - B. Dr. Profit or loss Account
- Cr. Trade Receivables Account
- Cr. Bad Debts Account
- C. Dr. Profit or loss Account Cr. Provision for Doubtful Debts Account
- D. Dr. Provision for Doubtful Debts Account Cr. Profit or loss Account
- E. Dr. Trade Receivables Account
- Cr. Profit or loss Account
- 10. The necessary accounting entries required to record Goodwill value in the books of partnership business on admission of a new partner is
  - A. Dr. New partner Capital Account
  - B. Dr. Goodwill Account
  - C. Dr. Realisation Account
  - D. Dr. Goodwill Account
  - E. Dr. Goodwill Account

- Cr. Goodwill Account
- Cr. New partner Capital Account
- Cr. Goodwill Account
- Cr. Realisation Account
- Cr. Revaluation Account

## 11. Use the following details to answer question **11**

Trade receivables control account balance	₦750,000
Provision for doubtful debt	₩75,000
Provision for discount allowed on receivable	5%

What is the trade receivables to be shown under current assets in the statement of financial position?

- A. ₩637,500
- B. ₩641,250
- C. ₩675,000
- D. ₩678,750
- E. ₩712,500

- 12. Acid test ratio means?
  - A. The total of non-current assets less current assets
  - B. The excess of the current assets over the current liabilities
  - C. The total assets less total capital
  - D. Current assets minus inventory over the current liabilities
  - E. The amount of capital invested by the shareholder
- 13. A value added statement should, as a minimum, contain the following, **EXCEPT** 
  - A. Turnover
  - B. Investment
  - C. Tax payable
  - D. Employees' wages and benefits
  - E. Bought-in materials and services
- 14. Assets are revalued when there is a change in partnership because
  - A. The law insists upon it
  - B. The agreement favours new partners
  - C. Inflation affects all values
  - D. It helps prevent injustice to some partners
  - E. It protects the interest of the incoming partner
- 15. In a limited liability company, which of the following is **NOT** an appropriation account item?
  - A. Preference share dividend
  - B. Final dividend
  - C. Net profit
  - D. Transfer to reserve
  - E. Interest on overdraft
- 16. Joint venture differ from partnership in that
  - A. Joint venture are formed to deal with inventory only
  - B. Co-venturer do not contribute capital
  - C. No-prior agreement are required to form a joint venture
  - D. Joint venture are usually for a limited period
  - E. Joint venture are carried on indefinitely
- 17. Which of the following ratios measures the efficiency of operation of an entity?
  - A. Current ratio
  - B. Dividend yield ratio
  - C. Gross profit to turnover ratio
  - D. Acid test ratio
  - E. Net profit to capital employed ratio

- 18. Which of the following is required to record transaction with the sub-tenant when accounting for royalties?
  - A. Royalties payable account
  - B. Short working receivable account
  - C. Royalties receivables account
  - D. Landlord account
  - E. Minimum rent account
- **19.** Which of the following is included in cash and cash equivalent in the statement of financial position of a company?
  - A. Bank overdraft
  - B. Loan notes
  - C. Equity shares
  - D. Fixed deposits
  - E. Inventories
- 20. The valuation of long term contract work-in-progress to date is determine as follows:
  - A. Cost of contract + Profit recognised + Forseable losses Progress pay recorded
  - B. Cost of contract Profit recognised Foreseable losses + Progress payment review/receivable
  - C. Cost of contract + Profit recognised Foreseable losses Progress payment recorded/review
  - D. Cost of contract Profit recognised Foresable losses Progress payment receivable/review
  - E. Cost of contract + Profit + Foresable losses + Progress payment review/receivable
- 21. Faulty goods costing №96,690 were returned to a supplier but this was recorded as №96,960 in the ledger accounts. The journal entry necessary to correct the error is
  - A. Dr. Purchases returns N270 Cr. Payables N270
  - B. Dr. suspense ₩270
    - Dr. purchases <del>N</del>270

purchases N270

D. Dr. payables  $\frac{1}{100}$ 

C.

Ε.

Dr.

Cr. payables ₦270

Cr. purchases №270

- Cr. purchase returns ₦270
- Cr. purchase returns N270

- 22. In line with classification by nature, which of the following must be disclosed on the face of the statement of comprehensive income?
  - Income tax expense l.
  - Depreciation 11.
  - Finance cost 111.
  - IV. Dividends paid
  - A. I and II
  - I and III B.
  - С. I. II and III
  - D. I and IV
  - II and IV Ε.
- Which of the following will involve movement of cash? 23.
  - Depreciation A.
  - Credit sales B,
  - C. Bonus issue of shares
  - Forfeiture of shares D.
  - Ε. **Rights issue of shares**
- Which of the following double entry represents a situation where goodwill is not 24. retained in partnership accounts?
  - l. Dr. Goodwill
  - Capital account in old ratio 11. Dr.
- Cr. Capital account in old ratio
- Cr. Goodwill account Cr. Capital account in new ratio
- Goodwill account 111. Dr. IV.
  - Capital account in new ratio Cr. Goodwill account
- A. I and II

Dr.

- B, I and III
- C. I and IV
- II and IV D,
- Ε. III and IV
- 25. Which of the following should be recognised in the statement of profit or loss?
  - Dividends paid to ordinary shareholders A.
  - Dividends paid to both preference and equity shareholders B.
  - Effect of change in accounting policy C.
  - Deficit on revaluation of property, plant and equipment D.
  - Surplus on revaluation of property, plant and equipment Ε.

- 26. Dapo sold goods to Nkechi on a sale or returns basis. The period of return has not expired. In Dapo's accounts the transaction could be recorded as
  - A. Recognise the transaction as an outright sale
  - B. Recognise the total profit generated in the transaction
  - C. Recognise the total goods at cost in the inventory
  - D. Recognise a certain percentage of the profit
  - E. Recognise Nkechi as a debtor for the amount
- 27. Which of the following is **NOT** suffered by a limited partner in partnership?
  - A. He cannot withdraw any part of his capital
  - B. He cannot take part in the management
  - C. He cannot dissolve the partnership by giving notice
  - D. He cannot share in the profit of the partnership without increasing fixed liability
  - E. Other partners can be introduced without his consent
- 28. Which of the following is **NOT** a heading Under IAS 7?
  - A. Cash flows from investing activities
  - B. Cash flows from normal activities
  - C. Cash flows from operating activities
  - D. Changes in working capital
  - E. Cash flows from financing activities
- 29. Given that sales is \$\,2,600,000, purchases \$\,1,500,000, opening inventory \$\,220,000 and closing inventory is \$\,260,000; what is the inventory turnover?
  - A. 6.1 times
  - B. 6.6 times
  - C. 10 times
  - D. 7 times
  - E. 10.8 times
- 30. Value of inventory destroy by fire in an entity is ₩1,800,000, inventory salvaged is ₩200,000 while the insurance policy taken against lost of inventory is ₩1,600,000. There is an average clause in the policy taken by the entity. How much is recoverable for the lost of inventory?
  - A. ₩1,240,000
  - B. ₩1,422,222
  - C. №1,440,000
  - D. ₩1,600,000
  - E. ₩1,800,000

SHORT-ANSWER QUESTIONS

(20 MARKS)

## **ATTEMPT ALL QUESTIONS**

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

- 1. The international accounting standard (IAS) 8 is on .....
- 2. An integral part of financial statements that provides details or supplementary information in respect of items disclosed in the Income Statement and Statement of Financial Position is .....
- 3. A document drawn up so as to agree the bank account position with the balance of the cash book is called .....
- 4. By carrying forward subscription in advance, one is applying ..... concept
- 5. Loss on revaluation of property, plant and equipment is recognised in the statement of .....
- 6. A statement prepared to show the statement of affairs of a firm at any point in time is called .....
- 7. A liability which is payable in a period longer than one year is called
- 9. In partnership account, the journal entry for Interest on drawings is ...... and .....
- 10. A suspense account is an account showing a balance which is equal to the difference in a .....
- 11. In business equation of a sole trader, profit increase is net assets less capital introduced plus .....
- 12. The amount advanced by a contractee to a contractor to enable construction work to commence on site is .....

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- 14. The necessary accounting entries required to write-off the profit made on the Reissued Forfeited Shares are ...... and .....
- 15. The cost of goods sold for a manufacturing company is calculated by adding opening inventory to ...... less closing inventory.
- 16. When current ratio is less than 1, working capital is .....
- 17. The account debited when short working is recovered is .....
- 18. The account in the books of P, who is in a joint venture with Q under memorandum joint venture method is headed as ...... account
- **19**. Discount on bills discounted is debited to .....
- 20. The payments over the lease term that are required to be made are called

## SECTION B: ATTEMPT ANY FOUR QUESTIONS 50 MARKS

## **QUESTION 1**

The statement of Financial position of Solomon Jubril Enterprises, a Rice merchant as at 31 December 2017 are as follows; The only books kept by the merchant are a cash book and a ledger.

#### SOLOMON JUBRIL ENTERPRISES

#### **STATEMENT OF FINANCIAL POSITION AS AT 31 December 2017**

Non-Current Assets	¥'000	<b>₩′000</b>
Freehold Premises	1,600	
Plant and Machinery	<u>450</u>	
2	2050	2050
<u>Current Asset</u>		
Inventory	900	
Receivables (Debtors)	980	
Cash	<u>30</u>	
	<u>1910</u>	<u>1910</u>
		<u>3,960</u>
<u>Equity &amp; Liabilities</u>		
Capital		3,200
Payables (Creditors)		<u>760</u>
		3,960

The following is a summary of his Receipts and Payments during the year ended 31 December 2018.

<u>RECEIPTS</u>	<b>₩′000</b>	PAYMENTS	<b>₩′000</b>
Capital paid in	250	Additions to machinery	150
Cash sales	1,860	Wages	750
Cash on account of		General Expenses	640
Credit sale	4,520	Creditors for goods	
		Purchased	4,000
		Drawings	520
		Balance c/d	<u>570</u>
	<u>6,630</u>		<u>6,630</u>

## **Additional Information:**

- On 31 December, 2018 the amount due to creditors was ¥820,000 and the Debtors and Inventory amounted to ¥940,000 and ¥860,000 respectively.
- Depreciation of 10% is to be written off the plant and machinery including additions during the year.
- A provision of ¥150,000 is to be made for Bad debt
- The sum of ¥50,000 for goods supplied to the proprietor was included in the debtors' balances as at 31<sup>st</sup> December 2018.

## You are required to;

Prepare the Trading and Profit or loss account for the year ended and the statement of financial position as at 31 December 2018.

Show your cash book and the ledger postings.

(Total 12 <sup>1</sup>/<sub>2</sub> Marks)

## **QUESTION 2**

IAS 2 inventory, states that inventory should be valued at the lower of cost and net realisable value.

- (2 Marks) Define Inventory a, (3 Marks)
- Explain what is meant by Realisable value. b.
- Jacko Limited has the following products in inventory at 30 September, 2019: C.

	Units	Cost per units <del>N</del>
Santona	17,400	187
Cracky	5,800	136

Jacko normally sells Santona at ¥289 per unit, and Cracky at ¥240 per unit. Jacko Limited expected to incur \\77.35 per unit in selling costs. \\34 per unit is expected to be incurred to complete cracky.

Calculate the amount at which inventory should be stated in the statement of financial position at 30 September, 2019. (7½ Marks)

(Total 12 <sup>1</sup>/<sub>2</sub> Marks)

## **QUESTION 3**

Two companies Alafia Limited and Karaole Limited trade in same market selling hand sanitiser and face masks. Their financial statement for the year ended 31 October 2019 are summarised below:

## STATEMENT OF PROFIT OR LOSS

	Alafia Limited	Karaole Limited
	GH¢'000	GH¢'000
Revenue	1,420	1,525
Cost of sales	(775)	(755)
Gross profit	645	770
Expenses:		
Admin Exp.	(120)	(185)
Distribution cost	(175)	(265)
Depreciation	(45)	(60)
Interest on loan notes		<u>(25)</u>
Net profit for the year	<u>305</u>	<u>235</u>

#### **STATEMENT OF FINANCIAL POSITION**

	Alafia Limited	Karaole Limited
Assets	GH¢'000	GH¢'000
Property plant & equipment	1,600	2,575
Accum. Depreciation	<u>(375)</u>	<u>(480)</u>
Carrying amount	1,225	2,095
Current Assets		
Inventory	455	1,465
Trade receivable	230	375
Cash and cash equivalent	320	75
	1,005	1,915
Total assets	2,230	4,010
Equity & Liabilities		
Equity		
Share capital	750	1,250
Retained earnings	540	885
	1,290	2,135
Non-Current Liabilities		
10% loan notes		250
Current Liabilities	<u>940</u>	<u>1,625</u>
Total liabilities & equities	<u>2,230</u>	<u>4,010</u>

## **Required**:

Calculate the following ratios for Alafia Limited and Karaole Limited. a.

- Profitability Ratios: Gross profit margin Net asset percentage Assets turnover ratios
- Liquidity Ratios: Current ratios **Quick ratios** Receivable collection period (days)

(6 Marks)

b, Compare and comment on the performance of the two companies as at 31 October 2019. (6½ Marks)

(Total: 12<sup>1</sup>/<sub>2</sub> Marks)

## **QUESTION 4**

Olu, Bisi and Abiodun have been in practice under the name OBA partners for many years sharing profits and losses in the ratio of 4:3:3. Bisi decided to retire on December 31, 2019 due to her relocation to Canada. The statement of financial position as at December 31, 2019 was as shown below:

## **OBA Partners**

## Statement of financial position as at December 31, 2019

	<mark>\</mark> ¥′000	<mark>\</mark> ¥'000	
Non-current assets			
Freehold land and building		5,400	
Plant and machinery		1,800	
Office equipment		450	
Motor vehicles		1,050	
Current assets			
Inventory	1,000		
Receivables	1,250		
Bank balances	<u>230</u>		
	<u>2,480</u>		
Current liabilities			
Payables	1,580		
Bank overdraft	<u>300</u>		
	<u>1,880</u>	<u>600</u>	
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	<u>9,300</u>
Financed by:	
Capital accounts	
Olu	4,200
Bisi	3,000
Abiodun	<u>2,100</u>
	<u>9,300</u>

The partners noted that the account did not reflect the followings:

(i) Interest should be charged on partners' drawings at 5%

Each of the partners had drawn ¥600,000.

- (ii) Interest on partner's capital account to be credited at 6%. Partners account for the purpose of the interest calculation is to be taken as follows:
  - Olu **№**2,100,000

Bisi ₩1,050,000

- Bisi received ¥2,400,000 paid by cheque immediately. (iii)
- Goodwill was valued at \3,000,000 and was to be retained in the books. (iv)
- Other assets and liabilities were valued as follows: (v) Freehold land and buildings ₦6,000,000 Plant and machinery ₦2,400,000 **Office equipment** ₦350,000 Motor vehicles ₦1,560,000
- Discount to be received from creditors amounted to ¥270,000. (vi)
- (vii) 20% of the receivables was irrecoverable.
- (viii) 15% of inventory was obsolete.
  - (ix) The balance due to Bisi is to be kept in the firm as a loan.

## You are required to prepare:

- a. The revaluation account. (3 Marks) b. The partners' capital accounts. (5 Marks) C.
  - The adjusted statement of financial position.

 $(4\frac{1}{2}Marks)$ (Total 12<sup>1</sup>/<sub>2</sub>Marks)

#### **QUESTION 5**

Luckydip Nigeria Limited

Profit or loss Account for the year ended 30 September 201			
-	<b>\</b> 2000	<b>₩′000</b>	
Turnover		5,200	
Cost of Goods sold		<u>2400</u>	
Gross Profit		2,800	

Salaries & Wages	1,600	
General expenses	480	
Provision for Depreciation	400	
Interest on Debentures	80	
		<u>2,560</u>
		240
Corporate tax for the year	50	
Proposed Dividend	40	90
		<u>150</u>

## Statement of Financial Position as at

	30 Septem	ber 2019		1	October 2	019
	<b>₩′000</b>	<b>₩′000</b>	<b>₩′000</b>	<b>₩′000</b>	<b>₩′000</b>	<b>₩′000</b>
Non-Current Assets (Cost)			3,600			3040
Accumulated Depreciation			1,840			1440
-			1,760			1600
Current Assets						
Inventory	320			460		
Trade Receivables	120			160		
Bank	<u>168</u>			88		
		608			708	
Current Liabilities						
Tax	50			60		
Trade Parables	220			200		
Accrued Wages	20			40		
Proposed Dividend	<u>40</u>			<u>40</u>	340	
-		<u>330</u>	<u>278</u>			<u>368</u>
			<u>2,038</u>			<u>1,968</u>
Financed by:						
Ordinary Shares			800			800
Retained Profit			518			368
10% Loan Notes			<u>720</u>			<u>800</u>
			<u>2,038</u>			<u>1,968</u>

## You are required to:

Prepare Statement of Cash Flows for the year ended 30 September, 2019 using direct method. Show all workings. (Total 12½Marks)

## QUESTION 6 INCOME & EXPENDITURE

The Treasurer of Agege Recreation Club prepares the receipt and payment account of the club for the year ended 31 December 2019 as follows;

## RECIEPTS

## PAYMENT

	¥′000		<mark>\</mark> 2000
Cash in hand 31/12/18	10	Bar Purchases	1885
Balances of Bank at 31/12/18		Wages	306
- Current Account	263	Rent and Rates	184
- Deposit Account	585	Lighting and heating	143
Entrance fees	54	New Lawn mower (Less allowance for	
		old one <del>N</del> 40,000)	120
Subscriptions;		General expenses	132
to 31/12/2018	30	Catering Purchase	80
to 31/12/2019	574	Additional furniture	460
to 31/12/2020	44	Cash in hand	8
Bar takings	2,285	Balances at bank 31/12/19	
Catering receipts	120	Current Account	176
Deposit account interest	<u>26</u>	Deposit Account	<u>497</u>
	<u>3,991</u>		<u>3991</u>

## Additional information;

(i) Book Values of Non –Current Assets as at 31 December 2018 were

- Furniture, Fixtures & Fittings \396,000 (Cost \440,000)
- Lawn mower ¥20,000 (Cost ¥120,000)
- (ii) Other Current Assets and Liabilities were as follows;

	31/12/19	31/12/18
	<mark>\\</mark> ′000	<mark>\</mark> 4′000
Bar Stock at cost	209	176
Amount Owed to Brewery for Bar purchases	186	248
Arrears of Rent and Rates	12	26
Arrears of Lighting & Heating	9	11
Subscription in arrears	30	50

(iii) A provision of 40% bonus on gross profit arising from the catering sales is to be made for the steward in the annual account.

(iv) Depreciation on furniture, fixtures and fittings is to be provided for at the rate of 10% on cost. No depreciation is to be provided on the new Lawn Mower, but a full year on the new furniture and fittings.

## **Required;**

showing Α statement the accumulated fund at 31/12/2018 a. as (3 <sup>1</sup>/<sub>2</sub> Marks) An Income and Expenditure Account for the year ended 31/12/2019. Showing b. separately a trading account for Bar sales and catering. (5 Marks) A statement of financial position as at 31 December 2019. (4 Marks) С. (Total: 12<sup>1</sup>/<sub>2</sub> Marks)

## SECTION A

## **PART I- MULTIPLE CHOICE SOLUTION**

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

- 28. B
- 29*.* A
- 30. C

#### WORKINGS

7)	Trade receivables account. Balance b/d	1,200,000
	Less Bad Debts	5,000
	Balance c/f	<u>1,195,000</u>
	Provision for Doubtful Debts	
	Balanced b/d P/L	25,000 <u>10,850</u> 35,850
	3% x#1,195,000 = 35,850	

Statement of Financial Position ₦ 1,195,000 - ₦ 35,850 = ₦ 1,159,150

Q11	Trade receivable balance	750,000
	Provision for doubtful debts	75,000
	Net receivable	675,000

Provision for discount on receivable at 5% of 675,000 = 33,750 Current provision + new provision 75,000+ 33,750 = 108,750 Receivable to be shown as:  $750,000 - 108,750 = \frac{1641,250}{100}$ 

21. Returns outward was overstated by N270 hence payables was understated by N270

Correction is Dr purchases returns and credit payables by N270

29.	Inventory turnover is:	<u>cost of sales</u>	<u>220+1500-260</u>
		Average inventory	(220+260)/2
30.	Amount claimable = <u>18</u>	<u>300</u> * 1,600,000	=N1,440,000
	(1,800 +	200)	

The questions test candidate's knowledge on various aspect of the syllabus. As a compulsory question, all the candidates attempted the questions and their performance was fair. Candidates' major pitfall was their poor preparation for the examination. Candidates are advised to always prepare well for the future examinations.

## PART II SHORT ANSWER SOLUTION

- 1. Accounting policies, changes in accounting estimates and error
- 2. Notes to the Accounts
- 3. Bank Reconciliation Statement
- 4. Matching / Accrual concept
- 5. Statement of Profit or loss
- 6. Statement of financial position
- 7. Non-current Liability
- 8. Fundamental and enhancing
- 9. Dr. Partner's current Account
  - Cr. Statement of Distribution of Income / Profit
- 10. Trial Balance
- 11. Drawings
- 12. Mobilization fee
- 13. Dr. Provision Account
  - Cr. Realization Account
- 14. Dr. Forfeited shares Re-issued Account Cr. Shares Premium Account
- 15. Cost of Production / Production cost
- 16. Negative
- 17. Shortworkings Recoverable Account
- 18. Joint venture with Q
- 19. Statement of Profit or loss
- 20. Minimum lease

The questions test various areas of the syllabus. The question is compulsory, therefore all the candidates attempted the questions.

Their performance was above average. Candidates' major pitfall was their poor preparation for the examination. Candidates are advised to prepare well for the future examination.

#### **SECTION B**

## **SOLUTION TO QUESTION 1**

<u>Solomon Jubril Enterprises</u>						
Statement of Profits or Loss for the year e	Statement of Profits or Loss for the year ended December 31, 2018					
	N'000	N'000	N'000			
Revenue			6,290			
<u>Cost of Sales:</u>						
Opening Inventory	900					
Purchases (4,060 - 50)	<u>4,010</u>					
Available for Sales	4,910					
Closing Inventory	<u>(860)</u>	4,050				
Wages		<u>750</u>				
Cost of Goods Sold			(4800)			
Gross Profit			1490			
Less Operating Expenses:						
Provision for bad debt		150				
Depreciation on P&M - 10% x (450 + 150)		60				
General Expenses		_640				
Total Operating Expenses			<u>(850)</u>			
Net Profit for the year			640			
<u>Solomon Jubril Enter</u>	<u>prises</u>					
Statement of Financial Position as at December 31, 2018						
	Cost	Acc Denr	Carrying			
	COST	Acc. Depi.	Amount			
<u>Non-Current Assets:</u>	N'000	N'000	N'000			
Freehold Premises	1.600	-	1.600			

Plant and Machinery	
Total Non-Current Asset	

540

2,140

(60)

(60)

600

2,200

<u>Current Assets:</u>				
Inventory			860	
Trade Receivables		890		
less: Provision for Bad Debts		<u>(150)</u>	740	
Cash			<u>600</u>	
Total Current Assets				<u>2,200</u>
Total Assets				<u>4,340</u>
<u>Equity and Liabilities:</u>				
Capital				3,450
Net Profit for the year				640
Drawings				<u>(570)</u>
Total Capital				3,520
<u>Current Liabilities:</u>				
Trade Payables				<u>820</u>
Total Equity and Liabilities				<u>4,340</u>
	<u>Workin</u>	<u>ig Notes</u>		
	Trade Receiv	vable Account		
	N'000			N'000
Balance b/f	980	Receipt & Payment		4,520
Credit Sales	<u>4,430</u>	Balance c/d (940 - 50)		<u>   890    </u>
	<u>5,410</u>			<u>5,410</u>
Balance b/d	890			
	Sales Reve	nue Account		
	N'000			N'000
Stat. of Profit or Loss	6,290	Credit Sales		4,430
		Receipt & Payment		<u>1,860</u>
	<u>6,290</u>			<u>6,290</u>
	Trade Paya	able Account		
	N'000			N'000
Receipt & Payment	4,000	Balance b/f		760
Balance c/d	<u>_820</u>	Credit Purchases		<u>4,060</u>
	<u>4,820</u>			<u>4,820</u>
		Balance b/d		820
	Drawing	s Account		
	N'000			N'000
Receipt & Payment	520			
Trade Receivables	_50	Balance c/d		<u>570</u>
	<u>570</u>			<u>570</u>
	22		AT/212/PII	

Balance b/d	570		
	Capital	Account	
	N'000		N'000
		Balance b/f	3,200
Balance c/d	<u>3,450</u>	Receipt & Payment	_250
	<u>3,450</u>		<u>3,450</u>
		Balance b/d	3,450
	Cash	ibook	
	N'000		N'000
Balance b/f	30	Additions to machinery	150
Capital paid in	250	Wages	750
Cash sales	1,860	General Expenses	640
Cash on account of credit sales	4,520	Creditors for goods Purchased	4,000
		Drawings	520
		Balance c/d	600
	<u>6,660</u>		<u>6,660</u>
Balance b/d	600		

The question test's candidate knowledge on ability to prepare simple statement of profit or loss and financial position with little adjustments.

About 75% of the candidates attempted the question and their performance was satisfactory.

Candidates' demonstrated good knowledge and understanding of the question's requirements. Candidates are advised to prepare well for the future examination.

## **SOLUTION TO QUESTION 2**

- (a) Inventory is an asset that is;
  - 1) Held for sale in the ordinary course of business
  - 11) In the process of production for such sale
  - 111) In the form of materials or supplies to be used in the production process or in the rendering of services.
- (b) Realisable value is the estimated selling price in the ordinary course of business less;
  - 1) Estimated costs of completion, and
  - 11) Estimated costs necessary to make the sale

c) <u>Jacko Limited</u>										
Computa	Computation of Value of Inventory to be shown in the Statement of Fin. Position at Sept. 30,									
	<u>2019.</u>									
	Cost		Net Real	isable Value				1		
Product	Per Units	Selling Price	Selling Costs	Expected Further Cost	NRV	Lower of Cost & NRV	Quantity on hand	Total Value		
	₩	₩	₩	₩	₩	₩	Units	N		
Santona	187.00	289.00	77.35	-	211.65	187.00	17,400	3,253,800		
Cracky	136.00	240.00	77.35	34.00	128.65	128.65	5,800	746,170		

## EXAMINER'S COMMENTS

The question tests candidates' knowledge on IAS2 (Inventory) with requirements to explain some certain terms in part (a) while it tests their ability to calculate inventory costs that should be included in the statement of financial position. About 65% of the candidates attempted the question and their performance was fair as they scored 40% of the mark allotted.

Candidates' major pitfall was their poor understanding of IAS2.

Candidates are advised to consult all relevant texts before deciding to sit for future examination.

S/N	Ratio	Formulae	Workings	Alafia	Workings	Karaole
				Ltd		ltd
1.	Gross profit	Gross Profit 100	645 <u>100</u>	=45.4%	770 100	=50.5%
	margin	Revenue <sup>x</sup> 1	1420 1		1525 1	
2.	Net Assets	Net Assets x 100	1290 x 100	=90.8%	2135 x 100	=140%
	Percentage	<u>??????</u> ?	1420		1525	
3.	Assets Turnover	Revenue	1420	=1.1	1525	0.64times
		??? <u>????</u> ?????????????????????????????	1290	times	2385	
4.	Current ratio	CurrentAssets	1005	= 1.07:1	1,915	1.18:1
		CurrentLiabilities	940		1625	
5.	Quick ratio	CA – Inventory	550	=0.59:1	450	=0.28:1
		CurrentLiabilities	940		1625	
6.	Receivable	<u>????????????????</u> ?	230 365	=59	375 365	= 90 days
	collection	???????????????????????????????????????	$\overline{1420}^{\times}\overline{1}$	days	$\overline{1525}^{\times}$ 1	
	period					

#### **SOLUTION TO QUESTION 3**

- (b) (i) The gross profit margin is high for both companies, Karaole Ltd has a higher revenue figure in absolute terms and also a high gross profit margin. As the two companies are in the same market, it is possible that the geographical location makes the difference in the profit margin.
  - (ii) Net Assets percentage of Alafia Ltd is 90.8% while that of Karaole Ltd is 140%. This shows that Karaole ltd is more efficient in Assets management than Alafia Ltd.
  - (iii) Assets turnover ratios show that Alafia Ltd made more efficient use of assets than Karaole Ltd as it is generating proportionally more revenue from assets. Karaole Ltd problem might be due to the fact that, it's working capital is tied up in inventory.
  - (iv) The current ratio of both companies is greater than one, with Karaole Ltd. having an edge slightly. This ratio indicates that both companies have sufficient current assets to meet its current liabilities/obligation.
  - (v) Both companies quick ratio is less than one, indicating potential liquidity problems. However Alafia Ltd situation appeared better than Karaole Ltd.

(vi) Receivables collection period of Alafia Ltd is also better, which indicates that Alafia working capital management may be better than that of Karaole Ltd.

## EXAMINER'S COMMENTS

The question tests candidates' knowledge on computation of accounting ratios and its interpretation with motive to infer useful information.

About 90% of the candidates attempted the question and their performance was fair. About 10% of those that attempted could give good analysis and interpretations of the ratios of the enterprises whose data were provided.

The major pitfall of the candidates was their inability to calculate the ratio correctly and subsequently failed to bring out correct information. Candidates are advised to prepare well for future examination.

Revaluation Account					
	N		N		
Office	100,000	Freehold land	600,000		
equipment		& Building			
Receivables	250,000	Machinery	600,000		
Inventory	150,000	Motor vehicles	510,000		
Balance c/d	4,480,000	Goodwill	3,000,000		
		Payables	270,000		
	<u>4,980,000</u>		4,980,000		
Capital		Balance b/d	4,480,000		
accounts:					
Olu 4/10	1,792,000				
Bisi 3/10	1,344,000				
Abiodun 3/10	<u>1,344,000</u>				
	<u>4,480,000</u>		<u>4,480,000</u>		

## **SOLUTION TO QUESTION 4**

Partners' capital Account							
	Olu	Bisi	Abiodun		Olu	Bisi	Abiodun
	N'000	N'000	N′000		N'000	N'000	N′000
Int on drawg	30	30	30	Bal b/d	4,200	3,000	2,100
Bank	-	2,400	-	Revalu. a/c	1,792	1,344	1,344
P or L				Int on Cap.	126	63	-
App a/c	39.6	29.7	29.7	-			
Bal c/d	<u>6,048.4</u>	<u>1,947.3</u>	<u>3,384.3</u>				
	<u>6,118</u>	<u>4,407</u>	<u>3,444</u>		<u>6,118</u>	<u>4,407</u>	<u>3,444</u>
			1	1	1	1	

# Appropriation Account (Working)

	N'000	N'000		N'000	N'000
Interest on Capital			Interest on Drawings:		
Olu	126		Olu	30	
Bisi	63		Bisi	30	
		189	Abiodun	30	
					90
			Share of loss		
			Olu <sup>4</sup> / <sub>10</sub> X N99,000	39.6	
			Bisi <sup>3</sup> / <sub>10</sub> X N99,000	29.7	
			Abiodun <sup>3</sup> / <sub>10</sub> X 99,000	29.7	
					99
		189			189

	N	N	N
Non-current Assets			
Freehold land and Building			6,000,000
Machinery			2,400,000
Office equipment			350,000
Motor vehicles			<u>1,560,000</u>
			10,310,000
Goodwill			3,000,000
			13,310,000
Current Assets			
Inventory	850,000		
Receivables	<u>1,000,000</u>		
		<u>1,850,000</u>	
Current liabilities			
Payables	1,310,000		
Bank overdraft	<u>2,470,000</u>	<u>(3,780,000)</u>	
		1,930,000	
Non-current liabilities –		194,7300	3,877,300
Loan (Bisi)			
			<u>9,432,700</u>
Financed by:			
Capital accounts			
Olu			6,048,400
Abiodun			<u>3,384,300</u>
			<u>9,432,700</u>

Olu, Abiodun & Co Adjusted Statement of financial position as at December 31, 2019

The question tests candidates' knowledge on partnership accounts, particularly in areas of revaluing partnership assets and its effects on partners capital accounts.

About 80% of the candidates attempted the question and their performance was good and scored good marks.

The candidates' display good knowledge and understanding of the topic being tested. Candidates are advised to prepare adequately for the future examination.

## SOLUTION TO QUESTION 5

## Lucky Dip Nigeria Limited

Statement of Cash flows for the year ende	d Septembe	r 30, 201	.9
Operating Activities:		N'000	N'000
Cash Received from Customers (Wk 1)			5,240
Cash Paid to Supplier (Wk 2)			(2,240)
Cash Paid to Employees (Wk 4)			(1,620)
Cash paid for other expenses			(480)
Interest paid			(80)
Taxation paid (Wk 5)			_(60)
Net Cashflow from Operating Activities			760
Investing Activities:			
Purchase of Non-Current Asset by cash (3,600 - 3	,040)	<u>(560)</u>	
Net Cashflow from Investing Activities			(560)
<u>Financing Activities:</u>			
Repayment of 10% Loan Notes (800 - 720)		(80)	
Dividend Paid		<u>(40)</u>	
Net Cashflow from Financing Activities		(120)	
Increase/(Decrease) in Cash and Cash Equivalent	for the		
year			80
Cash and Cash Equivalent brought forward			<u>_88</u>
Cash and Cash Equivalent carried forward			<u>168</u>
Working Notes			
Wk 1: Cash Received from Customers	N'000		
Opening Balance of Trade Receivables	160		
Turnover for the year	<u>5,200</u>		
Expected Closing Balance of Trade Receivables	5,360		
Actual Closing Balance of Trade Receivables	_120		
Cash Received from Customers	<u>5,240</u>		
Wk 2: Cash Paid to Suppliers	N'000		
Opening Balance of Trade Payables	200		
Purchases for the year	2,260		
Expected Closing Balance of Trade Payables 2,460			
Actual Closing Balance of Trade Payables	220		
Cash Paid to Suppliers	2,240		

Wk 3: Determination of Purchases	N'000
Cost of goods sold	2,400
Closing Inventory	320
Opening Inventory	<u>(460)</u>
Purchases for the year	<u>2,260</u>
Wk 4: <u>Cash Paid to Employees</u>	N'000
Opening Balance	40
Salary and Wages due for the year	<u>1,600</u>
Expected Closing Balance	1,640
Actual Closing Balance	20
Cash Paid to Employees	<u>1,620</u>
Wk 5: <u>Taxation Paid</u>	N'000
Opening Balance	60
Corporation tax due for the year (SOPL)	_50
Expected Closing Balance	110
Actual Closing Balance	_50
Cash Paid to Employees	<u>_60</u>

The question tests candidates' knowledge on the preparation of simple cash flows statement using direct method.

About 50% of the candidates attempted the question and their performance was fair as they scored about 40% of the marks allocated.

Candidates' major pitfall was their poor understanding of topic being tested using an indirect method in the question. Candidates are advised to prepare and practice very well for the institute's future examination.

## SOLUTION TO QUESTION 6

Agege Recreation Club					
Statement of Affairs as at December 31, 20	18				
<u>Assets:</u>	N'000	N'000			
Furniture, Fixtures & Fittings (Cost N440,000)		396			
Lawn mower (Cost N120,000)		20			
Bar Stock		176			
Subscription in arrears		50			
Cash in hand		10			
Balance at Bank:					
Current Account		263			
Deposit Account		<u>_585</u>			
Total Assets		1,500			
<u>Liabilities:</u>					
Amount owed to Brewery for Bar purchases	248				
Arrears of Rent and Rates	26				
Arrears of Lighting & Heating	<u>_11</u>				
Total Liabilities		<u>(285)</u>			
Accumulated Fund as at 31/12/2018		<u>1,215</u>			
Agege Recreation Club					
Bar Trading Account for the year ended December	31, 2019				
	N'000	N'000			
Bar takings		2,285			
<u>Cost of Bar Sales:</u>					
Bar Opening Inventory	176				
Bar Purchases	<u>1,823</u>				
Available for Sales	1,999				
Bar Closing Inventory	<u>(209)</u>				
Bar Cost of goods sold	1,790				
Bar Wages	<u>_306</u>				
Bar Cost of Sales		<u>(2,096)</u>			
Bar Gross Profit		189			

Calefing fraumy account for the year ended becembe	1 51, 2019	
	N'000	N'000
Catering Receipts		120
<u>Cost of Catering:</u>		
Catering Purchases	80	
Steward Bonus - 40/140 x (120 - 80)	<u>16</u>	
Catering Cost of Sales		<u>(96)</u>
Catering Gross Profit		_24
Agege Recreation Club		
Income and Expenditure Account for the year ended Dece	mber 31, 20	)19
Incomes:	N'000	N'000
Entrance Fees		54
Subscriptions		584
Profit on Traded-in (Lawn mower (40-20)		20
Gross profit from Bar Activities		189
Gross profit from Catering Activities		24
Deposit account interest		<u>_26</u>
Total Income		897
Expenditures:		
Rent and Rates	170	
Lighting and heating	141	
General expenses	132	
Depreciation on F & F (10% x 900,000)	<u>_90</u>	
Total Expendíture		<u>(533)</u>
Surplus		_364

## <u>Agege Recreation Club</u> Catering Trading Account for the year ended December 31, 2019

## Agege Recreation Club

Statement of Financial Position as at December 31, 2019			
		Acc	Carrying
	Cost	Depr	Amt
<u>Non-Current Assets:</u>	N'000	N'000	N'000
Furniture, Fixtures & Fittings (440 +460)	900	134	766
Lawn Mower (120 +40)	_160		<u>160</u>
Total Non-Current Asset	<u>1,060</u>	<u>134</u>	926

Current Assets:				
Bar Inventory			209	
Subscription in arrears			30	
Balance at Bank:				
Current Account			176	
Deposit Account			497	
Cash in hand			8	
Total Current Asset				920
Total Assets				
Equity and Liabilities:				
Accumulated Fund				1,215
Surplus				364
Total Equity				1,579
Current Liabilities:				
Subscriptions in advance			44	
Amount owed to Brewery f	or Bar pu	rchases	186	
Arrears of Rent and Rates	-		12	
Arrears of Lighting & Heati	ng		9	
Steward Bonus	16			
Total Current Liabilities	_	267		
Total Equity and Liabilities				_ 1,846
	<u>Workir</u>	ng Notes		
Bar	Payables	Ledger Account		
	N'000		N'000	
Receipt & Payment	1,885	Balance b/f	248	
Balance c/d	<u>186</u>	Bar Purchases	<u>1,823</u>	
	<u>2,071</u>		<u>2,071</u>	
		Balance b/d	186	
		'		
S	Subscripti	ons Account		
	N'000		N'000	
Arrears b/f	50	Receipt & Payments:		
		2018	30	
Inc. & Exp. (Bal. Fig.)	584	2019	574	
		2020	44	
Advance c/d	44	Arrears c/d	_30	
	<u>678</u>		<u>678</u>	
Arrears b/d	30	Advance b/d	44	
		33	AT/212/PII	

Rent and Rates Account				
	N'000		N'000	
Receipt & Payment	184	Balance b/f	26	
Balance c/d	<u>_12</u>	Inc. & Exp. (Bal. Fig.)	<u>170</u>	
	<u>196</u>		<u>196</u>	
		Balance b/d	12	
Ligi	hting and I	Heating Account		
	N'000		N'000	
Receipt & Payment	143	Balance b/f	11	
Balance c/d	9	Inc. & Exp. (Bal. Fig.)	<u>141</u>	
	<u>152</u>		<u>152</u>	
		Balance b/d	9	
Furnitur	e, Fixture a	and Fittings Account		
	N'000		N'000	
Balance b/f	440			
Additions (R & P)	<u>460</u>	Balance c/d	<u>900</u>	
	<u>900</u>		<u>900</u>	
Balance b/d	900			
Accumulat	ed Depreci	ation on F & F Account		
	N'000		N'000	
		Balance b/f (440 - 396)	44	
Balance c/d	<u>134</u>	Inc. & Exp. (10% x 900)	<u>   90  </u>	
	<u>134</u>		<u>134</u>	
		Balance b/d	134	
Trade	d-In of Law	vn Mower Account		
	N'000		N'000	
Cost	120	Acc. Depr. (120 - 20)	100	
Profit on Traded-in	_20	Traded-In Value	<u>_40</u>	
	<u>140</u>		<u>140</u>	

Lawn Mower Account				
	N'000		N'000	
Balance b/f	120	Traded-In	120	
Receipt & Payment	120			
Traded-In of Old Asset	<u>_40</u>	Balance c/d	<u>160</u>	
	<u>280</u>		<u>280</u>	
Balance b/d	160			

The question tests candidates' knowledge on the preparation of statement to calculate Accumulated fund statement of Income and Expenditure and Financial position of Not-for- Profit organisation.

About 70% of the candidates attempted the question and their performance was average.

Candidates major pitfall is their poor preparation for the examination. For the fact that this topic is commonly tested. Candidates are advised to prepare very well for the future examination.
AT/212/PII.6

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA



## ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA SEPTEMBER 2021 EXAMINATIONS (PART II)

## **PUBLIC SECTOR 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 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, 29 SEPTEMBER, 2021

#### 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 2021

#### **PUBLIC SECTOR ACCOUNTING**

#### 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. Which of the following is **NOT** saddled with the responsibility of preparing the financial statements of the Federal Government?
  - A. Permanent Secretary
  - B. Director of Finance
  - C. Accountant General of the Federation
  - D. Minister of Finance
  - E. Auditor General for the Federation
- 2. In accordance with Pension Reform Acts 2004, (as amended) all Pension Funds and assets shall be invested in any of the following, **EXCEPT** 
  - A. Real Estate investment
  - B. Bank deposits and Securities
  - C. Ordinary shares of Public Liability Companies (PLC)
  - D. Federal Government and Central Bank Securities, Bonds and Bills
  - E. Investment in hospitality industries
- 3. Which of the following is **NOT** a member of Federation Account Allocation Committee (FAAC) plenary section
  - 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
- 4. Which of the following is **NOT** true about Independent Corrupt Practices Commission (ICPC)?
  - A. It is established by an Act
  - B. It is a body Corporate
  - C. It has perpetual succession
  - D. It can sue and be sued in its own name

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- E. It can prosecute without recourse to Attorney-General
- 5. Which of the following International Public Sector Accounting Standards (IPSAS) discuss the preparation and presentation of cash flow statements?
  - A. IPSAS 5
  - B. IPSAS 6
  - C. IPSAS 2
  - D. IPSAS 3
  - E. IPSAS 4
- 6. Which of the following is **NOT** a means of controlling government expenditure by the executive?
  - A. Compilation and tentative approval of nation's budget
  - B. Issuance of budgetary guidelines
  - C. Introduction of 'due process' guidelines
  - D. Introduction of Public Procurement and Fiscal Responsibility Act, 2007
  - E. Introduction of guidelines for banking operations
- 7. Which of the following information is **NOT** contain in the General Purpose Financial Statement (GPFS)?
  - l. Revenue
  - II. Expenses
  - III. Assets
  - IV. Liability
  - V. Accumulated Funds
  - A. 1, 11, 111, and IV
  - B. I, II, and IV
  - C. I, II, III, and V
  - D. IV, III, and I
  - E. I, III, and II
- 8. Which of the following is **NOT** a statutory deduction from the employee payroll on Integrated Payroll and Personal Information System (IPPIS) platform?
  - A. Contribution Pension Scheme
  - B. Pay AS You Earns (PAYE)
  - C. National Housing Funds (NHF)
  - D. Thrift and Advance Due
  - E. National Health Insurance Scheme (NHIS)
- 9. Which of the following is **NOT** a non-tax revenue
  - A. Wireless communications

- B Geological survey
- C. Natural gas and crude oil
- D. Back-duty investigation
- E. Trade marks
- 10. Which of the following is **NOT** included in investing activity in the Statement No.1?
  - A. Proceeds from external loan
  - B Capital expenditure: Social services
  - C. Development expenditure: Law and justice
  - D. Development expenditure: Economics
  - E. Capital expenditure: Administrative
- 11. Which of the following is **NOT** included in the law enforcement and regulatory agencies on financial and other related matters?
  - A. Economic and Financial Crimes Commission (EFCC)
  - B. Independent Corrupt Practice and Other Related Offences Commission
  - C. Corporate Affairs Commission (CAC)
  - D. Code of Conduct Bureau/Code of Conduct Tribunal Act,
  - E. Nigeria Extractive Industries Transparency Initiative, (NEITI) Act
- 12. Which of the following is **NOT** a liability as contained in the Statement No:2
  - A. Development funds
  - B. External Loans: FGN only
  - C. Loan stock
  - D. Grant-in-aid
  - E. Internal loan
- 13. The document showing summary of various contracts in order to know at any given time, receivables in the projects is the
  - A. Contract register
  - B. Contract note
  - C. Project summary
  - D. Project register
  - E. Contract voucher
- 14. The primary focus of business accounting is profitability. The primary focus of fund accounting is
  - A. Following the rules of a democracy
  - B. Recording of spendings

- C. Responsibility for spending
- D. Checks and balances
- E. Ways and means
- 15. Government officers and agencies serve as ...... of taxpayers' money.
  - A. Stewards
  - B. Administrators
  - C. Keepers
  - D. Butlers
  - E. Checks and balances
- 16. The scope of The International Public Sector Accounting Standards could be described as
  - A. Internal standards for public sector accounting for internal use
  - B. International standards for public sector accounting for internal use
  - C. General purpose financial statements prepared under cash or accrual basis of accounting for public sector entities
  - D. Internal standards for public sector accounting for international use
  - E. International standards for public sector accounting for external use
- 17. The Minister of Finance is **NOT** authorised by law to
  - A. Manage the Consolidated Revenue Fund
  - B. Authorise issue from Consolidated Revenue Fund
  - C. Suspend issued warrant for statutory first line charges
  - D. Suspend issued warrant for appropriate expenditure
  - E. Correct erroneous receipts into the consolidated fund
- 18. Which of the following is **NOT** part of the content of a contract register?
  - A. Signature of vote controller
  - B. Address of contractor
  - C. Terms of payment
  - D. Period of completion of the contract
  - E. Signature of the contractor
- **19.** The Auditor-General is expected to write his reports, stating whether in his opinion
  - I. Proper books of Accounting records are being kept
  - 11. The Accounts shows a true and fair view
  - 111. There are adequate safeguards over the custody of public funds
  - IV. Public moneys are expended for the purposes for which they are meant

- A. 1
- B. 11
- C. 111
- D. IV
- E. I, II, III and IV
- 20. Which of the following is **NOT** a member of the Executive Arm of Government?
  - A. The President
  - B. The State Governor
  - C. A Local Government Chairman
  - D. A Minister
  - E. The President of the Senate
- 21. Which of the following is an advantage of a Surplus Budget?
  - A. It is a device to solve unemployment problems
  - B. It is used to stimulate economic growth
  - C. It is used to solve the problem of inflation
  - D. It enables Government to fully utilise its resources
  - E. It promotes infrastructural development
- 22. Which of the following is **NOT** the objective of setting the Bureau for Public Procurement?
  - A. To attain transparency, competitiveness and professionalism in the Public Sector
  - B. To ensure value for money audit
  - C. To harmonise the existing government policies and procedures on public procurement and ensuring probity
  - D. To establish pricing standard and benchmarks
  - E. To ensure standard for disposal of public assets
- 23. Which of the following shall be considered as major deviation on submitted bid?
  - A. The use of codes
  - B. The difference in technical details
  - C. The difference in standards
  - D. The difference in material
  - E. The difference in initial delivery schedule
- 24. Who approves the Medium Term Expenditure Framework?
  - A. Auditor-General
  - B. Federal Executive Council and the National Assembly

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- C. National Assembly
- D. Accountant – General
- Ε. The Minister
- 25. The Board of Survey is mostly convened by ..... at the end of each financial year
  - Α. Accountant General
  - Attorney-General Β.
  - Officer controlling Vote Book С.
  - Surveyor-General D.
  - Auditor-General Ε.
- Which of the following is **NOT** a characteristic of Government Business 26 **Enterprise**?
  - A. The entity is fully controlled by a public sector entity
  - Has the power to contract in its own name B.
  - C. Relies on government funding to be a going concern
  - Has been assigned the financial and operational authority to carry on a D business
  - Provides goods and services in the normal course of its business to other Ε. entities without profit
- 27. The secondary purposes of auditing is/are
  - Give a true and fair view of the state of the financial affairs ۱.
  - Detection of frauds and errors 11.
  - Prevention of frauds or errors 111.
  - IV. Report theft to the commissioner of police
  - A. I and III
  - B. II and III
  - С. IV
  - D. I and II 1
  - Ε.
- Which of the following is **NOT** one of the significant of IPSAS in Nigeria? 28.
  - A. It supports efficient internal controls
  - It promotes transparency and accountability B.
  - It improves the quality of financial management C.
  - It recognises cash transactions and disregard Debtors D.
  - It reduces the risk of manipulating financial information Ε.

- 29. According to Financial Regulation (FR) 2505, a Board of Enquiry may **NOT** be necessary in the following circumstances:
  - 1. If loss is substantial
  - 11. If it is an isolated case
  - 111. If the loss is a small one
  - IV. If several officers are involved
  - A. 1
  - B. I and II
  - C. I and IV
  - D. II and III
  - E. IV
- 30. Which of the following have constitutional power to make periodic check to Parastatals?
  - A. Director General
  - B. Auditor General
  - C. Director General of Education
  - D. Permanent Secretary Ministry of health
  - E. Director of Accounts

SHORT-ANSWER QUESTIONS

(20 MARKS)

#### ATTEMPT ALL QUESTIONS

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

- 1. The money that is set aside to meet defect and repairs in the event of any structural defect on a contract is called.....
- 2. In internal audit, internal checks procedures and risks designed to safeguard assets of a Local Government Council are called .....
- 3. Pension Reform Act 2004 (as amended) states the minimum number of employees required for operation of the scheme as.....
- 4. The procedure by which fund is transferred from one sub head to another within the same Head of Expenditure is known as .....
- 5. A Ministry or Extra-Ministerial Department which has no control whatsoever over any of its accounting and financial records is referred to as.....
- 6. The estimate of the Government's Tax and Non-Tax Revenue for a new fiscal year is called .....
- 7. The ..... is an officer who is saddled with the responsibility of collecting some specified forms of revenue on behalf of the government
- 8. The bases for compilation and preparation of the Financial Reports of the public sector enterprises are...... and.....
- 9. In the operation of selective tenders, the number of contractors competing should not be less than .....
- 10. The Federation Accounts Allocation Committee (FAAC) meeting is normally divided into two institutional sessions, namely ...... and .....
- 11. The Committee that handles queries raised by the Auditor-General is called
- 12. A memorandum book used for monitoring government expenditure and ensuring that there is no extra-budgetary spending is known as .....
- 13. A 'not for profit' entity is expected to prepare ...... Account

- 14. The budgeting method adopted by Extra-Ministerial Department is .....
- 15. The system which calculates the physical balance after each issue or receipt of materials is called .....
- 16. The distribution from Federation Account shall be rendered to both Houses of National Assembly by the ..... not later than ninety days, following the year end.
- 17. Notes to the accounts form part of a complete set of financial statements (**TRUE OR FALSE**)
- 18. International Public Sector Accounting Standard (IPSAS) 12 relates to .....
- 19. A structured representation of the financial position and financial performance of an entity is known as .....
- 20. Accounts from the Nigeria High Commissions overseas is **NOT** one of the various sources from which information are obtained for the production of the Federal Government Accounts (**TRUE OR FALSE**)

SECTION B:

#### **QUESTION 1**

In a budget year, before government departments spend money, requests have to be made and authorised by the Legislature. This is done through the mechanism of estimates.

#### **Required**:

a. In accordance with the Financial Regulation 2009, outline the procedures that a Head of Department should follow when estimating expenditure for a budget year. (4 Marks)

b. i. What is warrant? (1 Mark) ii. State the characteristics of **FIVE** Capital Expenditure warrants. (7½ Marks) (Total: 12½ Marks)

#### **QUESTION 2**

Government Integrated Financial Management Information System (GIFMIS) is an economic reform and governance project which will support the Public Financial Management and targeted anti-corruption initiative of the government.

#### You are required to:

- a. Explain the strength and weaknesses of the reform on the improvement of financial activities of the government (10 Marks)
- b. State the goals of Government Integrated Financial Management Information System (GIFMIS) in the budget implementation and financial activities of the government (2½ Marks)

#### (Total: 12<sup>1</sup>/<sub>2</sub> Marks)

#### **QUESTION 3**

a. List **THREE** internal and **FIVE** external users of public sector accounting and identify specific uses to which these groups put the accounting information.

(8 Marks)

b. What is the percentage of Federation Account that goes into the Consolidated Revenue Fund (CRF) and how it is expected to be distributed? (4½ Marks) (Total: 12½ Marks)

#### **QUESTION 4**

The following discoveries were made by the Accountant-General while carrying out a special check on the book of account of Atiba State.

- i. On March 2017, the sum of N472,500,000 was fraudulently withdrawn from Iwoye State and charged to Consolidated Revenue Fund. The fraud was discovered on January 2018.
- On 15 June 2018, an overpayment of ¥1,575,000 was made to Okanlu Limited, ii. in respect of supply of equipment to the new Government House built by the former administration. This was discovered on 19 August of the same year.
- iii. On 29 October, 2018, an amount of ¥67,500, being the revenue accruable to the State Government from rent of property which was abandoned but never received.
- On 3 November 2018, an officer died while in active service. The aggregate of his iv. pension and gratuity was ¥116,408 while he had an outstanding motor vehicle advance of **№**145.222.
- On 12 November 2018, the sum of N547,500 which was initially charged to ٧. correspondence advance had been abandoned.

#### You are required to:

Journalise the transactions on the discoveries made above. (Total 12½Marks)

#### **QUESTION 5**

The following data were extracted from the books of Stephen State of Naija as at 31 December, 2013.

	<del>N</del> '000	¥′000
Earnings and Sales		3,750
Licenceses and Fines		4,500
Loans to Local Government	10,500	
Re-Imbursement		16,500
Development Fund (Capital Vote)		22,500
Consolidated Revenue Fund b/f		25,500
Fees		6,750
Statutory Allocation		45,000
Cash Account	3,750	
Bank Account	22,500	
Loans from Federal Government		16,500
Interest on Repayment		750
4	7	AT/212/PII

External Loans		52,500
Development Fund as at 1 <sup>st</sup> Jan.	52,500	
Internal Loans		30,000
Capital Expenditure	63,000	
Special Fund		34,500
Recurrent Expenditure	33,750	
Other Income		4,500
Fixed Deposit with ZIB Plc	<u>77,250</u>	
	<u>263,250</u>	<u>263,250</u>

#### Other relevant information;

- (i) There was omission of an amount of ¥11,250,000 received from the Federal Government as grant to execute Capital Projects from the books.
- (ii) An amount of N38,250,000 received as Development Fund yet to be transferred.
- (iii) Out of the total amount of interest on repayment, only N600,000 was actually received.
- (iv) Omitted from the books was expenditure amounting to \$3,000,000.

#### You are required to prepare;

a.	Consolidated Revenue Fund Account	(4 Marks)
b <i>.</i>	Development Fund Account	(3 Marks)
С.	Statement of Assets and Liabilities	(5½ Marks)

(Note: Show your workings of Bank Account) (Total 12½Marks)

#### **QUESTION 6**

A. The office of the Auditor-General for the Federation has a project Audit Division which carries out value-for-money audit of projects. This unit conducts compliance audit, using such data as the 1999 constitution, public procurement Act of 2007, Appropriation Acts, Budgets and financial Regulations.

In relation to the public Sector Audit, write short notes on the following:

i.	Audit of gratuities and pensions	(3 Marks)
ii.	Regulatory Audit	(3 Marks)
iii.	Economy Audit	(2 Marks)
iv.	Effectiveness Audit	(2 Marks)

B. Briefly describe the reasons behind the operation of value-for-money Audit in the public Sector. (2½ Marks)
 (2½ Marks)

SECTION A PART 1		MULTIPLE-CHOICE SOLUTION
1.	E	
2.	E	
3.	E	
4.	E	
5.	С	
6 <i>.</i>	E	
7.	BONUS	
8 <i>.</i>	D	
9 <i>.</i>	D	
10.	A	
11.	С	
12.	D	
13.	A	
14.	С	
15.	А	
16.	С	
17.	С	
18.	E	
19.	E	
20.	E	
21.	С	
22.	В	
23.	В	
24.	С	
25.	А	
26.	С	

27. B

- 28. D
- 29. D
- 30. B

#### EXAMINER'S COMMENTS

This consists of 30 questions which covers the entire syllabus. It is a compulsory 30 marks question. The major pitfall is as a result of ill-preparation by the candidates. They are advised to make adequate utilization of the ICAN study text.

#### PART II SHORT-ANSWER SOLUTION

- 1. Retention fee
- 2. Internal control
- 3. 15
- 4. Virement
- 5. Non-Self Accounting Unit
- 6. Revenue Budget (Estimate)/ ANNUAL BUDGET
- 7. Revenue Collector
- 8. i. Accrual Basis or (Commitment Basis) and ii. Cash Basis
- 9. Five (5)
- 10. Technical Session and Plenary Session
- 11. Public Accounts Committee
- 12. Vote Book
- 13. Income and Expenditure
- 14. Rolling Plan Budgeting System
- 15. Perpetual Inventory System
- 16. Federation Account Allocation Committee
- 17. True
- 18. Inventories
- **19.** Financial Statements
- 20. False

#### EXAMINER'S COMMENTS

This consist of 20 marks compulsory questions that covers the whole syllabus. It requires candidates to write the correct answer that best completes each of the questions/statements. The major pitfall is as a result of their failure to prepare well for the exam. The candidates are advised to make adequate use of the ICAN study text and past question of ICAN exam.

#### **SECTION B**

#### **SOLUTION 1**

- 1a. A Head of Department should:
- i. Take into consideration, Government's macro economic framework, resources, priorities and ceilings.
- ii. Prepare a strategic plan which will include a definition of the departments' mission, goals objective, output and activities.
- iii. Cost and prioritize the activities of the department taking into consideration the resource ceiling.
- iv. Prepare the budget statement in accordance with the directives in the Financial regulation.
- v. Prepare cash forecast, identifying when expenditure outflow is projected to take place.
- vi. Where a Government Department is legally authorized to use part of the revenue generated, it is expected that the Head of Department should disclose the portion of the expenditure that would be funded by the Internally generated revenue which has been retained for spending.
- 1bi Warrant is a document used by the Ministry of Finance to authorise expenditure (spending) by Government Departments and Agencies.

There are two (2) main classes of warrant; Recurrent Expenditure warrant and Capital Expenditure warrant.

Recurrent Expenditure Warrant is used to incure expenditure that are regular in the course of organization's annual operations, items or services consumed within the year while capital Expenditure warrant is not incurred often, it is used for capital projects only.

1bii

a. Development Fund Annual General Warrant (DFAGW)

This authorizes the Accountant General of the Federation to issue funds on capital projects as contained and approved by capital estimate and mandates of the officers controlling Expenditure votes to disburse on envisaged capital projects. This authority can only be conveyed after the National Assembly has approved the Capital Expenditure budget.

- b. Provisional Development Fund General Warrant
  - This is issued before the approval of the capital estimate by the National Assembly at the beginning of the financial year. It authorizes payment from the Development Fund of such amounts that is necessary for carrying on the project for which expenditure have been authorized in the previous Financial year, for. period of six months or until the authority of the National Assembly has been obtained, whichever is shorter.

#### c. Development Fund Supplementary General Warrant (DFSGW)

- The Development Supplementary General Warrant authorizes the Accountant General to issue funds and the officers controlling expenditure/votes to incur expenditure on projects approved by the National Assembly. The Minister of Finance may exclude any item of expenditure included in Supplementary capital estimates which it is desired to exercise special control.
- d. Development Fund Reserved Expenditure Warrant A Development Fund Expenditure Warrant authorizes the release of funds in the approved annual or supplementary capital estimates but excluded from Development fund supplementary General warrant (DFSGW). It is the release of funds which the Minister of Finance initially withheld in order to exercise control.
- e. Development Fund Supplementary Warrant (DFSW) This warrant authorizes additional expenditure over and above that which is included in the Development Fund Annual General Warrant or Development Fund Supplementary General Warrant (DFSGW) for the purpose of the capital expenditure which was provided for in the previous financial year but not fully expended in that year, accelerate the provisions of funds already formally allocated but not voted for a project and also accelerate the completion of a specific capital project.

#### f. Development Fund Special Warrant (DFSW) Issued in exceptional cases where virement is not possible. Provision for the release if additional funds reveals such high degree of urgency that the release of funds cannot be postponed until a supplementary capital estimate is approved. The amount to be expended under this warrant must not exceed the balance of the Development fund remaining after all other expenditure provided

#### g. Development Fund Virement Warrant (DFVW)

for in the capital estimate have been in cured.

This permits the issue of additional funds necessary for the completion of a capital project for which money already allocated in the estimate is not enough to complete the project. Limitations to Virement Warrant include:

- i.) Reallocation can only be made within the same head of expenditure in the capital estimate
- ii.) Reallocation must not give rise to a new policy

iii.) It cannot be used to provide funds for new projects.

#### EXAMINER'S COMMENTS

The question tested the candidate's knowledge and understanding of the procedures for the preparation of budget for the year with the directives in Financial Regulation.

Part "b", tested their knowledge of Warrants and characteristics of the Capital Expenditure Warrants

The major pitfall is the failure of the candidates to understand the various procedures of budget preparation. Candidates are advised to make adequate use of ICAN study text and previous years past questions.

#### **SOLUTION 2**

- a. Government Integrated Financial Management Information System (GIFMIS) is an economic reform and governance project which will support the Public Financial Management and targeted anti-corruption initiative of the government. The strength of the financial reform include:
- 1. To build an integrated budget based on programs that are clearly linked to key development objectives;
- 2. To ensure greater accountability and transparency from budget implementation;
- 3. To allow greater emphasis on budget outcomes and effective impact on economic growth and development;
- 4. To identify and address remaining sources of leakage in budget execution in order to strengthen efficiency of public expenditures.
- 5. To provides an opportunity to migrate to Treasury Single Account
- 6. It will provide better access to information which can be used to improve fiscal and operational management
- 7. GIFMIS will reduce fiduciary risk by enabling greater transparency and by reducing the opportunities for manual intervention in financial transactions.

GIFMIS weaknesses includes:

- 1. Failure to enact the budget before the start of the financial year.
- 2. The budget is not based on realistic forecasts of cash availability.
- 3. Lack of effective cash management –multiple bank accounts within Treasury and MDAs that makes effective control impossible;
- 4. Lack of cash forecast w leads to inefficient and unplanned borrowing

5. A lack of integration between different financial management functions and processes, e.g. budget is prepared in a way that makes it difficult to manage budget execution through the chart of accounts.

#### b. <u>OBJECTIVES OF GIFMIS</u>

The objectives or aims or goals of GIFMIS include:

- 1. Increases the ability of government to undertake central control and monitoring of expenditure and receipts in the MDAs.
- 2. Increases the ability to access information on financial and operational performance.
- 3. Increases internal controls to prevent and detect potential and actual fraud.
- 4. Increases the ability to access information on Government's cash position and economic performance.
- 5. Improves medium term planning through a Medium Term Expenditure Framework (MTEF).
- 6. Provides the ability to understand the costs of groups of activities and tasks.
- 7. Increases the ability to demonstrate accountability and transparency to the public and cooperating partners.

#### EXAMINER'S COMMENTS

The question tested the candidate's knowledge and understanding of Government Integrated Financial Management Information System (GIFMIS). It requires them to explain the strength and weaknesses of the reform as well as to state its goals in the budget implementation and Financial activities of the government.

The major pitfall is the inability of the candidates to adequately explain the strength and weaknesses of the GIFMIS reform. The candidates are advised to prepare well for future examination. They should utilize the ICAN study text and past questions of previous diets.

#### **SOLUTION 3**

#### a. USERS AND USES OF PUBLIC SECTORACCOUNTING:

Users of Government Accounts can be grouped into two;

**Internal Users**: They are those using financial information that are prepared within their Ministry or Department. e.g. Members of the Executive and their advisers, The top administrators of various Government ministries and agencies, Permanent Secretaries, Managers of Departments and divisions of Government units, subordinates who are delegated with control tasks etc.

The following are the internal users of Public Sector Accounting information and their uses;

<b>S</b> /	INTERNAL USERS	USES
N		
1	President, Governor, Ministers,	They use it for planning and control
	Commissioners, Chairmen of Local	
	Government	
2	The employee	They use it to agitate for increase in
		salary
3	Director general, Vice Chancellelor,	They use it for planning and control
	Permanent Secretary etc.	
4	The trade union within the	They use it to agitate for better
	organization	welfare of
		staff and increase in salary
5	The subordinates who are given control	To execute Government task
	task	
6	Board of Directors of GBEs	They use it for planning and control

**External Users:** Are those who use Government Financial information that are not prepared within their Ministry or Department. e.g. Members of the legislature and selected committees of the houses using reports from another legislature or house,

Government other than the reporting Government, Researchers, members of the public, Sectional groups, international monetary organisations, regional Organisation, rating agencies e.g. Flitch, Standard and Poor etc.

S/N	EXTERNAL USERS	USES
1	International monetary organisations e.g. world bank, IMF, Commercial Banks	To review if loan can be granted, re- scheduled, or pardoned
2	Regional organisations e.g. Ecowas, African Union etc.	To know if the country can be of assistance
3	Members of the public	To evaluate Government performance
4	Creditors / Suppliers	To decide if goods or services can be rendered to Government on credit
5	Researchers and Financial Journalists	To conclude their research.
6	Trade Union, Civil Liberty Organisation	To agitate for increase in salary of workers
7	Government other than reporting Government	For evaluation, agitation for increase in revenue allocation formula

b. Percentage of Federation Account that goes into the CRF and how it is expected to be distributed

52.68% share of the Federal Account goes into the Consolidated Revenue Fund and is sub-allocated by the Federal Government on the following basis:

$\checkmark$	Federal government	48 <i>.</i> 50% √
$\checkmark$	FGN Share of Derivation Ecology	1 <i>.</i> 00% √
$\checkmark$	Federal Capital Territory	1 <i>.</i> 00% √
$\checkmark$	Stabilization Fund	<b>0.50%</b> √
$\checkmark$	Development of Natural Resources	<b>1.68%</b> √
	Total	<b>52.68</b> %

#### **EXAMINER'S COMMENTS**

The question is divided into part "a" and "b". The "a" part tested the candidates knowledge of the INTERNAL and EXTERNAL users of Public Sector Accounting and Specific uses they put the accounting Information.

The "b" part required candidates to state the percentage of Federation Account that goes into the Consolidated Revenue Fund (CRF) and how it is to be distributed. The major pitfall is their poor understanding of the specific uses which the accounting information are being required. Candidates are thus, advise to consult the ICAN study text and make adequate use of previous diets' questions for practices.

#### **SOLUTION 4**

		DR	CR
		N	N
(í)	Non – Personal Advance A/C Consolidated Revenue Fund A/C <i>Being an amount fraudulently withdrawn from</i> <i>Iwoye State Account and charged to Consolidat</i> <i>Revenue Fund.</i>	472,500,000 1 ted	472,500,000
(ii)	Non – Personal Advance A/C Ministry of Works and Housing <i>Being overpayment for the supply of Equipme</i>	1,575,000 ent	1,575,000
(ii	i) No Adjustment Required		
(ív)	Loss of Fund A/C Motor Vehicle Advance A/C <i>Being an outstanding advance found to be</i> <i>Irrecoverable and written off</i>	28,814	28,814
(v)	Loss of Fund A/C Correspondence Advance A/C <i>Being an amount charged to advance account</i> <i>and now abandoned</i>	547,500 t	547,500

#### **EXAMINER'S COMMENTS**

The question tested the candidate's knowledge and understanding of preparation of Journals. The major pitfall is their inability to make correct entries on the journal preparation. The candidates are enjoined to make adequate preparation for future examinations. They should also take advantage of the ICAN study text and previous diets' examination questions.

#### **SOLUTION 5**

a.

## **STEPHEN STATE**

Consolidated Revenue Fund for the year ended 31<sup>st</sup> December, 2013

	₩′000	<b>₩′000</b>
Balance b/f		25,500
Statutory Allocation		45,000
Licenses and Fines		4,500
Earnings and Sales		3,750
Fees		6,750
Re-imbursement		16,500
Interest on Repayment		600
Other incomes		<u>4,500</u>
1055		10/,100
LESS: Decurrent Expenditure	33 750	
Other Experiatures	3 000	
Transfer to Development fund	38 250	(75 000)
Balance c/f	<u>30,230</u>	32.100
h Development Fund Account as at 31 December 201	2	
b. Development i und Account ds dt 51 December, 201	=N=000	
Balance b/f	(52,500)	
Federal Government Grant	11,250	
Capital Vote	22,500	
Internal Loans	30,000	
External Loans	52,500	
Transfer from CRF	<u>38,250</u>	
	102,000	
Capital Expenditure	<u>63,000)</u>	
Balance c/f	<u>39,000</u>	

c. Statement of Assets and Liabilities as at 31 December, 2013	
	<mark>₩</mark> 000
<u>ASSETS</u>	
Fixed Deposit with ZIB Plc.	77,250
Loans to Local Government	10,500
Bank Account	30,600
Cash Account	3,750
	<u>122,100</u>
REPRESENTED BY:	
Consolidated Revenue Fund (CRF)	32,100
Development Fund	39,000
Special Fund	34,500
Loans from Federal Government	<u>16,500</u>
	<u>122,100</u>

Workings:

## BANK ACCOUNT

	=N=000		=N=000
Balance b/f	22,500	Expenditure	3,000
Federal Government Gra	nt 11,250	Unrealized interest on repaymer	nt 150
		Balance c/f	<u>30,600</u>
	<u>33,750</u>		<u>33,750</u>
Balance b/f	30,600		

AT/212/DII	
AI/ZIZ/FII	

#### **OR (ALTERNATIVE SOLUTION)**

#### STEPHEN STATE

## Consolidated Revenue Fund for the year ended 31<sup>st</sup> December, 2013

	<mark>\\</mark> ′000	<mark>\</mark> ¥′000
Balance b/f		25,500
Statutory Allocation		45,000
Licenses and Fines		4,500
Earnings and Sales		3,750
Fees		6,750
Re-imbursement		16,500
Interest on Repayment		600
Other incomes		<u>4,500</u>
		107,100
Less:		
Recurrent Expenditure	33,750	
Transfer to Development fund	<u>38,250</u>	<u>(72,000)</u>
Balance c/f		<u>35,100</u>

b. Development Fund Account as at 31 December, 2013			
·		<mark>₩</mark> 000	
Balance b/f		(52,500)	
Federal Government Grant		11,250	
Capital Vote		22,500	
Internal Loans		30,000	
External Loans		52,500	
Transfer from CRF		<u>38,250</u>	
		102,000	
Capital Expenditure	63,000		
Other Expenditure	<u>3,000</u>	(66,000)	
Balance c/f		<u>36,000</u>	
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a.

	<mark>₩</mark> 000
<u>ASSETS</u>	
Fixed Deposit with ZIB Plc.	77,250
Loans to Local Government	10,500
Bank Account	30,600
Cash Account	3,750
	<u>122,100</u>
REPRESENTED BY:	
Consolidated Revenue Fund (CRF)	35,100
Development Fund	36,000
Special Fund	34,500
Loans from Federal Government	<u>16,500</u>
	122.100

Statement of Assets and Liabilities as at 31 December, 2013

#### **EXAMINER'S COMMENTS**

С.

This question tested the candidate's knowledge and understanding of the preparation of the following statements: (i) Consolidated Revenue Fund Account; (ii) Development Fund Account; (iii) Statement of Assets and Liabilities. The major pitfall is as a result of the failure by the candidates to understand the preparation of the financial statements in the public sector. The candidates are advised to make adequate use of the ICAN Study Text and previous diet's ICAN examination questions.

#### **SOLUTION 6**

#### 6a. i AUDIT OF GRATUITIES AND PENSIONS

This is to ensure that the claims are bonafide and free from errors and manipulation. The audit is conducted by the pensions unit of Auditor-General's office. Documents required for the verification and authentication include completed pension forms, certified true copy of record of service, debt clearance certificate, photocopy of letter of promotion to the last grade and photocopy of letter of notice of retirement and acceptance

#### a. ii. **REGULATORY AUDIT**

This is compliance Audit. It poses questions as, "is the expenditure duly authorized in accordance with the financial regulations?" Is there sufficient fund under the Head and Sub-Head of the budgeted expenditure?

Compliance auditor uses the 1999 Nigerian Constitution, Civil Service Rules, Treasury circulars, financial regulations and Appropriation Acts to carry out his assignment.

#### a. iii ECONOMY AUDIT

This addresses how economically management acquires resources in the needed quantity and quality at the lowest possible costs.

#### a. iv EFFECTIVENESS AUDIT

This is an assessment of whether programs executed to fulfill laid out policy goals, have indeed achieved the set objectives. The concept is also referred to as program results Audit.

- 6. b. The drive of this technique (value-for-money Audit) is to ELIMINATE or DRASTICALLY REDUCE :
  - a. Waste
  - b. Extravagance
  - c. Fraud

#### EXAMINER'S COMMENTS

The question required candidates to write short notes on some terminologies in relation to the Public Sector Audit. The "b" part tested the candidate's knowledge on reason for the operation of Value-for-Money Audit in Public Sector. The major pitfall is their poor preparation for the exams. The candidates are advised to make adequate use of the ICAN Study Texts as well as the past questions of previous diets examination.

AT/212/PII.7

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA



## ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA SEPTEMBER 2021 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 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, 29 SEPTEMBER, 2021

#### 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 2021

#### **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. A process that ensures every element of the population has some known chance of being selected is known as
  - A. Non- random sampling
  - B. Simple random sampling
  - C. Stratified sampling
  - D. Random sampling
  - E. Systematic sampling
- 2. Which of the following is **NOT** an example of non- probability sampling?
  - A. Convenience sampling
  - B. Quota sampling
  - C. Cluster sampling
  - D. Haphazard sampling
  - E. Judgments sampling
- 3. Which of the following is **NOT** a bar chart?
  - A. Component
  - B. Simple
  - C. Percentage component
  - D. Cumulative
  - E. Multiple
- 4. A distribution in which the mode is greater than the median and the median is greater than the mean is referred to as a
  - A Positively-skewed distribution
  - B Normal distribution
  - C Negatively-skewed distribution
  - D Continuous distribution
  - E Poisson distribution

- 5. Which of the following is normally used by an Accountant for making decision when series of values are summarised into a figure?
  - A. Average
  - B. Table
  - C. Chart
  - D. Regression
  - E. Correlation
- 6. Which of the following is **NOT** a measure of partitioning?
  - A. Quintiles
  - B. Interquartile
  - C. Percentiles
  - D. Deciles
  - E. Quartiles
- 7. Which of the following is **NOT** a measure of dispersion?
  - A. Standard deviation
  - B. Interquartile range
  - C. Arithmetic mean
  - D. Mean deviation
  - E. Quartile Deviation
- 8. The following data shows the relationship between income (x) of an Accountant and the monthly upkeep given to the wife (y) for a period of 10 months:

 $\mathbb{PP} = 620, \quad \mathbb{P}^2 = 440, \quad \mathbb{P}^2 = 900, \quad \mathbb{P} = 64, \quad \mathbb{P} = 90.$ 

Calculate the Pearson's correlation coefficient.

- A. 0.9412
- B. 0.8412
- C. 0.4899
- D. 0.4889
- E. 0.0016
- 9. A component of time series analysis that deals with a variation caused by unpredictable events such as floods, disasters, wars, etc is known as
  - A. Secular variation
  - B. Cyclical variation
  - C. Seasonal variation
  - D. Irregular variation
  - E. Natural variation

- 10. The weighted index number that uses the arithmetic mean of the quantities or prices of the current and base time points as weighing factors is referred to
  - A. Fisher's ideal index
  - B. Laspeyre's index
  - C. Paasche's index
  - D. Marshal edge-worth's index
  - E. Simple aggregate price index
- 11. A survey of a housing estate showed that 28% of the tenants had GoTV and 78% had Startimes TV subscriptions. The probability that a household picked at random had either a GoTV or a Startimes TV subscription is
  - A 0.1584
    B 0.1707
    C 0.2184
    D 0.7816
    E 0.8416
- 12. The standard deviation of scores obtained by candidates who sat for Quantitative Analysis March diet of ATSWA examination was 15. If a random sample of 9 candidates gave a mean score of 47, then the calculated test statistic for testing the hypothesis:  $H_0: \mu = 50$   $H_1: \mu > 50$  is given as
  - A. t = -0.6B. t = 0.6C. t = 0.65D. z = -0.6E z = 0.6
- 13. If the cost and revenue functions (both in  $\mathbb{N}$ ) of a small firm producing a local hand sanitizer are respectively C(x) = 5x + 2000 and R(x) = 9x, where x is the quantity of the sanitizer produced and sold, then the maximum value of x for the firm to make a profit of at most  $\mathbb{N}10,000$  is
  - A.  $x \le 1,000$
  - **B.**  $x \le 2,000$
  - **C.**  $x \le 2,500$
  - **D.**  $x \le 3,000$
  - **E.**  $x \le 3,500$

- 14. The weekly costs ( $\mathbb{H}_C$ ) for AKJIL Plc were plotted against the company's production level (*P*) for the last 100 weeks. If the regression line for the company is estimated to be C = 1,200 + 500 x, which of the following statements is true about the weekly costs?
  - A. Fixed costs are ¥1,200. Variable costs per unit are ¥5
  - B. Fixed costs are ₦1,200. Variable costs per unit are ₦50,000
  - C. Fixed costs are ¥1,200. Variable costs per unit are ¥500
  - D. Fixed costs are ¥12. Variable costs per unit are ¥5
  - E. Fixed costs are ¥ 12. Variable costs per unit are ¥ 500
- 15. When there is a relationship between the change in the quantity demanded and the price of a good or service, the elasticity is known as
  - A. Income elasticity of demand
  - B. Gross elasticity of demand
  - C. Consumer elasticity of demand
  - D. Equilibrium elasticity of demand
  - E. Price elasticity of demand
- 16. A firm has estimated that the sales function P(x) = 25x 3 and the cost function  $C(x) = 1500 + 9x^2 13x$ , where x is the number of items produced and sold. Determine the break-even quantity for the firm.
  - A. –11.3
  - B. -10.0
  - C. –9.4
  - D. 9.4
  - E. 10.0
- 17. Find the amount which would be obtained from a principal of N2,000 at 6% compounded quarterly for 5 years.
  - A. ₩2,593.71
  - B. ₩2,673.71
  - C. ₩2,683.71
  - D. ₩2,693.71
  - E. ₩2,793.71

18. The cash flows of a mini-project with the discount factors are presented in the table below:

Year	Net cash flow( <del>N</del> )	Discount factor
0	(750,000)	1
1	200,000	0.833
2	450,000	0.694
3	550,000	0.579

The Net Present Value (NPV) of the project is

- A. −<del>№</del>43,750
- B. −<del>N</del>47,350
- C. ₩43,750
- D. ₩47,350
- E. ₩50,000
- 19. Operations Research tools are from
  - A. Computer Science
  - B. Economics
  - C. Engineering
  - D. Mathematics
  - E. Statistics
- 20. A tight constraint will have a shadow price of
  - A Zero
  - B One
  - C Greater than zero
  - D The value of the right hand side of the constraint
  - E Less than zero
- 21. The objective function of Dual Linear Programming problem of the following Primal problem:

Min.  $P = 12x_1 + 26x_2$ Subject to:  $3x_1 + 4x_2 \ge 5$ , and  $2x_1 + 6x_2 \ge 6$ ,  $x_1, x_2 \ge 0$  is

A. Min.Q =  $5y_1 + 6y_2$ 

- **B.** Max.**Q** =  $5y_1 + 6y_2$
- C. Min.P =  $3x_1 + 4x_2$
- **D.** Min.Q =  $3y_1 + 4y_2$
- **E.** Min.P =  $5y_1 + 6y_2$
- 22. A firm's annual demand is 100,000 units. Each unit costs ¥400. If the cost of placing an order is ¥7,000 and the annual holding cost is 20% of the purchase price of a unit, calculate the economic order quantity
  - A. 4,181.3 units
  - B. 4,182.0 units
  - C. 4,183.3 units
  - D. 4,184.0 units
  - E. 4,284.3 units
- 23. Given that EOQ is 250,000 units in a manufacturing industry. If the cost of placing an order is \$8,000 with the holding cost 10% of the purchase price per unit, determine the annual demand if the cost of each unit is \$650.
  - A. 252,903,250 units
  - B. 252,904,250 units
  - C. 252,905,250 units
  - D. 253,906,250 units
  - E. 253,907,250 units
- 24. The formula for average stock level is given as
  - A. Minimum stock level +  $\frac{1}{2}$  of Re-order level
  - **B.** Maximum stock level  $+\frac{1}{2}$  of Re-order level
  - C. Minimum stock level +  $\frac{1}{3}$  of Re-order level
  - **D.** Maximum stock level  $+\frac{1}{3}$  of Re-order level
  - E. Minimum stock level  $+\frac{1}{4}$  of Re-order level

#### Use the following information to answer questions 25 and 26:

The transportation problem of shipping commodities A, B and C to warehouses X, Y and Z is modeled with the unit costs tabulated below:

If the initial solution to the problem obtained using North-West Corner Rule (NWCR) method, is shown in the following allocation table:

Warehouses Commodíties	X	Y	Z	SUPPLY
A	2 10	3	4	15
В	1	2 10	2 q	20
С	4	5	4 r	15
DEMAND	10	15	25	

#### **25.** The value of q is

- A 25 B 20
- C 15
- D 10
- E 5
- 26. The value of *r* is
  - A 5
  - B 10
  - C 15
  - D 20
  - E 25
- 27. The amount of time, for which a group of activities could be delayed without affecting the overall project duration, is known as
  - A. Earliest time
  - B. Free float
  - C. Independent float
  - D. Latest time
  - E Total float
28. The Activity – On – Node network diagram below indicates the Earliest Starting Time (EST) and Latest Starting Time (LST) of a small project.



What is the value of the Earliest Starting Time, x?

- A. 20
- B. 23
- C. 25
- D. 33
- E 43
- 29. If the average life span of an electronic component in an Automated Teller Machine (ATM) of a bank is 2.5, then the average number of weekly replacements of 600 components is
  - A. 150
  - B. 240
  - C. 850
  - D. 1040
  - E 1200
- **30.** A firm manufactures 4 types of one of its products. The probability distributions for demanding these types of products are as tabulated below:

Туре	Probability
A	0.15
В	0.42
C	0.28
D	0.15

Use the random numbers 63 and 38 to simulate the next two demands

- A. Type C, Type D respectively
- B. Type B, Type D respectively
- C. Type D, Type C respectively

- D. Type B, Type C respectively
- E. Type C, Type B respectively

## 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. If a regression model y = 4.5 6.2x, then the value of regression coefficient is
- 2. If the coefficient of variation of a data set is 100%, then its mean must be equal to its.....
- 3. The marks obtained by the students in an Accounting examination are 12, 11, 10, 7, 8, *U* and 16. If the mean is estimated to be 10, then the variance is .....
- 4. Given that the Laspeyre price index is 112.8% and Paasche price index is 113.69%, the Fisher's price index is .....
- 5. The present value of \$1.8 million at 20% simple interest rate over  $2\frac{1}{2}$  years is.....
- 6. The group of items in a stock at the time, during which inventory is taken is known as .....
- 7. For every Linear Programming (LP) problem, there is a corresponding dual form. The original LP problem is known as .....

Use the following network diagram to answer questions 8 and 9:

• All the activities are given in days.



- 8. Find the sum of Earliest Start Times (EST) for activities F and H in weeks.
- 9. Calculate the Total float for Activity F in months if 30 days make a month.
- 10. The marks obtained by the students in an Accounting examination are 12, 11, 10, 7, 8, U and 16. If the mean is estimated to be 10, the median is .....
- 11. The selling price of an item produced by a company is \$100. If the total overhead cost is \$8,750 and the cost per unit is \$75, then the number of units that must be produced and sold for the company to break-even is
- 12. A graphical solution to any form of equation is regarded as an .....

13. Currently, the number of methods for solving a Linear Programming problem is

Time (t)	Value of series (Y)	Trend by LSM $Y = 43 + 7t$	Seasonal variation assuming additive model
1	47		р
2	58		
3	62		

14. The value of *p* in the table below is .....

- 15. Rejection of a null hypothesis when it is true and expected to be accepted leads to .....
- 16. The two main costs that increase with time in the replacement of items that wear-out gradually are ...... and .....
- 17. Sample is a fractional part of a population for which data can be sought and it must be a ......sample.
- 18. Operations Research attempts to find ...... solution to a problem.
- 20. A transportation problem is unbalanced if ..... is not equal to

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

Wage( Leo'000)	Number of Staff
5 - 10	14
11 - 20	7
21 - 30	15
31 - 40	8
41 - 50	6

a. The following table shows the weekly wages of 50 members of staff in a factory:

You are required to calculate the

i <i>.</i>	Twentieth percentile	(3½ Marks)

- ii. Eightieth percentile (2½ Marks)
- b. From the given observations below, establish the relationship among arithmetic mean, geometric mean and harmonic mean:

20, 18, 9, 7, 12, 16, 17, 24, 14 and 13.

(6½ Marks) (Total 12<sup>1</sup>/<sub>2</sub> Marks)

## **QUESTION 2**

a.

Type of cost	Value (per year)
Cost of capital	8.50%
Cost due to breakages	6.50%
Rent paid toward physical space for storage	3.50%
Premium paid to insure inventory	0.25%
Tax	1.00%

The data in the table above shows the data collected for one item.

Compute the following:

i <i>.</i>	Inventory carrying rate	(3 Marks)
------------	-------------------------	-----------

- ii. The annual carrying costs of an item that costs \$20 (1½ Marks)
- iii. The total annual carrying cost for 15 items that costs N20 per unit

(1½ Marks)

- iv. The total carrying cost for 15 items that cost N20 per unit and are held in inventory for a period of 2 years (1½ Marks)
- b. An item has an annual demand of 5,000 units, the inventory costs are based on an annual interest rate of 20%, the purchase cost of the item is N10 and the ordering cost is N25.20 per order.

#### Compute

- i. The lot size for an item (2½ Marks)
- ii. The cycle time, if there are 250 working days in a year (2½ Marks) (Total 12¹/2 Marks)

## **QUESTION 3**

a. Determine the Quartile deviation of the hourly wage distribution of 500 workers of a manufacturing company given in the following table:

Class interval (¥'00)	Cumulative Frequency
10 - 19.9	11
20 - 29.9	35
30 - 39,9	89
40 - 49.9	239
50 - 59 <i>.</i> 9	347
60 - 69.9	425
70 - 79.9	476
80 - 89.9	496
90 - 99.9	500

(6<sup>1</sup>/<sub>2</sub> Marks)

b. The distribution of book sales (in hundreds) in a bookshop is tabulated as follows:

Class Interval	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 – 59	60 - 64
Frequency	3	5	11	9	7	7	6	7

## Calculate

i.	the mean using a coding factor of 5 with an Assum	led mean of 4700
		(3 <sup>1</sup> / <sub>2</sub> Marks)
ii.	the mean deviation	(2 <sup>1</sup> / <sub>2</sub> Marks)

(Total  $12^{1}/_{2}$  Marks)

## **QUESTION 4**

A clothing manufacturing company produces jerseys for high school bookstores a, in runs of up to 200. If the manufacturer sells the jerseys at Le85 each and the cost function for a run of x jerseys is estimated to be

 $C(x) = 1,550 + 10x + 0.3x^{2}$  $(0 \le x \le 200)$ 

## You are required to find:

i.	How many clothing should the manufacturer produce to make profit		
ii.	The quantity at which the profit is maximised	(3½ Marks) (1½ Marks)	
iii.	The maximum profit.	(1 Mark)	
iv.	The price at maximum profit.	(1 Mark)	

b. The demand function for goods produced by a particular company is given by:  $p(q) = \sqrt{2,500-q}$ , where q is the quantity of goods produced and sold and p (in *Le*) is the price of goods.

## You are required to:

i.	Investigate the effect of increase in price when 2,02 demanded	25 of the goods are (2 <sup>1</sup> / <sub>2</sub> Marks)
ii.	Comment on your result obtained in (i) above	(1 Mark)
iii.	Find the price that will maximise the revenue	(2 Marks) Total 12¹/₂ Marks)

## **QUESTION 5**

An organisation has three machine shops: A, B and C and it produces three a, products: X, Y and Z using these three machine shops. Each product involves the operation of the machine shops. The times available at the machine shops: A, B, and C are 100, 72 and 80 hours respectively. The profits of the products: X, Y and

Z are N22, N6 and N2 per unit respectively. The following table shows the time required for each operation for unit quantity of each product:

Products	Machíne shops			
	A	B	С	
Х	10	7	2	
Y	2	3	4	
Z	1	2	1	

- i. Formulate the appropriate Linear Programming Problem for minimising the profits and define all symbols used  $(2^{1}/_{2} \text{ Marks})$
- ii. Set up the initial tableau based on the simplex method  $(7^{1}/_{2} \text{ Marks})$
- b. Obtain the dual problem of the following:

Maximise Z = 40a + 240b + 200cSubject to  $2a + 3b + 4c \le 45$  $2 + 82 + 52 \le 30$  $2, 2, 2 \ge 0$ 

(2<sup>1</sup>/<sub>2</sub> Marks) (Total 12<sup>1</sup>/<sub>2</sub> Marks)

## **QUESTION 6**

A sachet water dealer has 3 depots: X, Y and Z in 3 different locations. The dealer has 5,000 bags of sachet water in depot X, 4,500 bags in depot Y and 5,500 bags in depot Z. He has an order for his products from three different major distributors: D<sub>1</sub>, D<sub>2</sub> and D<sub>3</sub>. Distributor D<sub>1</sub> requires 5,600 bags, D<sub>2</sub> requires 6,700 bags and D<sub>3</sub> requires 3,700 bags. The table below shows the transportation cost per bag in Ghana cedis (GH) from each depot to each distributor:

	Distributors					
Depots	$D_1$	<b>D</b> <sub>2</sub>	<b>D</b> <sub>3</sub>			
Х	20	40	25			
Y	30	50	40			
Z	35	60	15			

i Use the Vogel's Approximation Method to determine the initial basic number of bags that can be supplied from each depot to various distributors and hence, test for feasibility. (6 Marks)

- ii Calculate the initial basic total transportation cost  $(1^{1}/_{2} \text{ Marks})$
- b. A businessman has 4 mini-projects to be assigned to 4 different contractors.

The table below gives the total cost ( $\mathbf{W}$ 'million) of completing each project by the contractors based on their quotations:

	Projects				
Contractors	X	Y	Ζ	W	
1	11	14	16	19	
2	15	15	19	11	
3	12	9	8	17	
4	19	17	12	10	

Use the reducing-cost matrix method to obtain the optimal assignment of the contractors to the projects and hence, determine the total minimum cost of the 4 projects.

(5 Marks) (Total 12<sup>1</sup>/<sub>2</sub> Marks)

## FORMULAE

Sample variance,  $s^2 = \frac{\sum (x - \overline{x})^2}{n-1}$ Economic Order Quantity

$$\mathbf{Q} = \sqrt{\frac{2cd}{n}}$$
$$\mathbf{Z}_{cal} = \frac{\overline{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

Slope of a regression equation

$$\mathbf{b} = \frac{n\sum xy - \sum x\sum y}{n\sum x^2 - (\sum x)^2}$$

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

The 95% confidence interval for  $\mu$ 

 $= \overline{x} \pm t_{\underline{\alpha}, n-1} \frac{s}{\sqrt{n}}$ The trend equation, y = a + bt, where  $t = x_i - x_m$ 

$$\mathbf{b} = \frac{\sum ty}{\sum t^2} \cdot \mathbf{a} = \overline{y} - bx_m, \ \mathbf{x}_m = \text{median of } \mathbf{x} \text{ values}$$

$$\mathsf{SARP1} = \frac{\sum \left(\frac{P_n}{P_o} \times 100\right)}{N}$$

$$SAP1 = \frac{\sum P_{ni}}{\sum P_{oi}} \times 100$$

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

## EOQ with stock-out

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

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

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

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

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

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

## Spearman's rank correlation coefficient

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

# EOQ with gradual replenishment

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

Length of Inventory cycle =  $\frac{Q}{d}$ 

Number of *production runs* =  $\frac{d}{Q}$ 

Production cost = Ordering cos t + Holdering cos t

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

# **SECTION A**

PART	1	:	MULTIPLE CHOIC	<b>CE SOLUTIONS</b>
1.	D			
2.	С			
3.	D			
4.	С			
5.	A			
6 <i>.</i>	В			
7.	С			
8 <i>.</i>	B			
9 <i>.</i>	D			
10.	D			
11.	Ε			
12.	D			
13.	D			
14.	С			
15.	Ε			
16.	Ε			
17.	D			
18.	D			
19.	D			
20.	С			
21.	B			
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- 22. D
- 23. D
- 24. A
- 25. D
- 26*.* C
- 27. E
- 28. C
- 29. B
- 30*.* E

WORKINGS (MCS)

8. 
$$r = \frac{n\sum xy - \sum x\sum y}{\sqrt{[n(\sum x^2 - (\sum x)^2][n(\sum y^2 - (\sum y)^2]]}} = \frac{10(620) - 64(90)}{\sqrt{[10(440) - (64)^2][10(900) - (90)^2]}}$$
$$= \frac{6200 - 5760}{\sqrt{[4400 - 4096][9000) - 8100]}} = \frac{440}{\sqrt{[304][900]}} = \frac{440}{\sqrt{273600}}$$
$$= \frac{440}{523.07} = 0.8412$$

Answer is B. 0.8412

11. Pr (Household has either a GoTV or a Startimes TV)

= Pr (GoTV) + Pr (Startimes TV)- Pr (both GoTV and Startimes TV)

 $= 0.28 + 0.78 - (0.28 \times 0.78)$ = 1.026 - 0.2184

= 0.8416

## The correct option is E

**12.** Since  $\delta$  is known i.e  $\delta = 15$ 

The test statistic is

$$Z = \frac{\overline{x} - \mu}{\frac{\delta}{\sqrt{n}}}$$
$$Z = \frac{47 - 50}{\frac{15}{\sqrt{9}}} = \frac{-3}{5}$$

Z = -0.6

- 13. Profit function, P(x) = R(x) C(x) P(x) = 9x - (5x + 2,000) P(x) = 4x - 2,000but  $P(x) \le 10,000$ ∴  $4x - 2,000 \le 10,000$   $4x \le 10,000 + 2,000$   $4x \le 12,000$   $x \le \frac{12,000}{4}$  $x \le 3,000$
- 14. If C = 1,200 + 500 x, then the fixed costs are  $\aleph$  1,200 and variable costs are

(C)

₦500 per unit.

16.  $TR = P(x) X x = (25x-3)x = 25x^2-3x$   $TC = 1500 + 9x^2 - 13x$ At breakeven point TR = TC  $25x^2-3x = 1500 + 9x^2 - 13x$   $25x^2 - 9x^2-3x + 13x + 1500 = 0$  $16x^2 + 10x - 1500 = 0$ 

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(D)

 $82^{2} + 52 - 750 = 0$   $82^{2} + 802 - 752 - 750 = 0$  82 2 + 10 - 75 (2 + 10) = 0 82 - 75 2 + 10 = 0i.e 2 = --22 - 10 2 = 9.375 22 - 10

Since x cannot be negative, then x = 9.375

Therefore break-even quantity for the firm is 10 units. (E)

17. 
$$P = 2000, r = 6\% = \frac{0.06}{4} = 0.015$$
  
 $n = 5 \times 4 = 20$   
 $A = P(1+r)^n = 2000(1+0.015)^{20} = N2693.71$ 

18.

$$\begin{split} NPV &= (-750,000 \times 1) + (200,000 \times 0.833) + (450,000 \times 0.694) + (550,000 \times 0.579) \\ NPV &= -750,000 + 166,600 + 312,300 + 318,450 \end{split}$$

(*D*)

$$NPV = \$47,350$$
 (D)

**22.** 
$$C_0 = \#7000, C_h = \frac{20}{100} \times 400 = \#80, D = 100,000$$

$$EOQ = \sqrt{\frac{2C_0D}{C_h}} = \sqrt{\frac{2 \times 7000 \times 100,000}{80}} = 4,183.3 \text{ units} = 4,184 \text{ unit}$$
 (D)

**23.** 
$$EOQ = 250,000 C_0 = 8000, C_h = \frac{10}{100} \times 650 = #65$$

$$250,000 = \sqrt{\frac{2 \times 8000 \times D}{65}}$$
$$D = \frac{250,000^2 \times 65}{16,000} = 253,906,250 \text{ units}$$
(D)

To answer questions 25 and 26, the allocation table is completed, using NWCR method, as follows:

Warehouses	Х		Y		Z			Supply
Commodifies								
А		2		3			4	<del>-15- 10 -5-</del> 0
	10		5					
В		1		2			2	- <del>20 -10</del> 0
			10		10			
С		4		5			4	<del>-15</del> 0
					15			
Demand		- <del>10</del> -		<del>-15-</del>		<del>-25-</del>		60
		0		-5		<del>-10</del> -		
				0		-5		
						0		

**25.** From the allocation table, the value of q = 10. **D** 

**26.** From the allocation table, the value of r = 15.

28.



С

To get the EST, by using the forward pass approach

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**29.** Average number of weekly replacements =  $\frac{\text{Number of component}}{\text{Average life span of component}}$ 

Average number of weekly replacements =  $\frac{600}{2.5}$ 

Average number of weekly replacements = 240 (B)

30.

Туре	Probability
А	0.15
В	0.42
С	0.28
D	0.15

Random numbers (R-N) are 63, 35,

For R-N 63 is Type C

For R-N 35 is Type B (E)

PART II:

- **1.** -6.2
- 2. Standard Deviation
- 3. 10
- 4. 113.24%
- 5. ₩1,200,000 or ₩1.2million
- 6. Physical stock
- 7. Primal Solution
- 8. 30 weeks
- 9. 1 month
- 10. 10
- 11. 350
- 12. Estimate/Approximate solution/Approximation
- 13. Three (3)
- 14. -3
- 15. Type l error
- 16. Maintenance, Repair
- 17. Representative sample
- 18. Optimal
- **19**. **13**.33 %
- 20. Total demand, total supply

## WORKINGS (SAS)

3. 
$$Mean = \frac{\sum X}{n} = 10$$
  
where  $n = 7$   
 $\sum X = 12 + 11 + 10 + 7 + 8 + U$   
 $\sum X = 64 + U$   
 $\therefore 10 = \frac{64 + U}{7}$   
 $70 = 64 + U$   
 $U = 70 - 64$   
 $U = 6$ 

+16

Using *Variance* =  $(S.D)^2$ 

where 
$$SD = \sqrt{\frac{\sum (x - \overline{x})^2}{n}}$$

$$Variance = \frac{\sum (x - \overline{x})^2}{n}$$

where 
$$n = 7$$
 and  $\bar{x} = 10$   

$$\sum (x - \bar{x})^2 = (12 - 10)^2 + (11 - 10)^2 + (10 - 10)^2 + (7 - 10)^2 + (8 - 10)^2 + (6 - 10)^2 + (16 - 10)^2$$

$$\sum (x - \bar{x})^2 = 4 + 1 + 0 + 9 + 4 + 16 + 36$$

$$\sum (x - \bar{x})^2 = 70$$
*Variance* =  $\frac{70}{7}$ 
*Variance* = 10

4.

238h22 222382322222 = 222232238238238222 × 222232h22382382222 91 AT/212/PII 5. A = P(1 + rn)

where A = 1.8m, r = 20% = 0.2,  $n = 2\frac{1}{2}years = 2.5$ 

$$P = \frac{A}{1+rn} = \frac{1.8m}{1+(0.2)(2.5)} = \frac{1.8m}{1.5} = 1.2m$$

8. The sum for Earliest Sarting Times for Activity F = 0 + 63 + 0 = 63 days



The sum for Earliest Sarting Times for Activity H = 0 + 63 + 0 + 25 + 59 = 147days Sum of Earliest Start Time (EST) for activities F and H = 63 + 147 = 210 days = 30 weeks

> Answer is: 30 weeks AT/212/PII



Total Float = LFT - EST - D

Total Float for activity F = 147 - 63 - 54 = 30 days = 1 month (since 30 days make a month)

Answer is: 1 month

10. Mean = 
$$\frac{\sum X}{n} = 10$$
  
where  $n = 7$   
 $\sum X = 12 + 11 + 10 + 7 + 8 + U + 16$   
 $\sum X = 64 + U$   
 $\therefore 10 = \frac{64 + U}{7}$   
 $70 = 64 + U$   
 $U = 70 - 64$   
 $U = 6$ 

In descending order, the data is arranged as follows: 16, 12, 11, 10, 8, 7, 6

Therefore, the median = 10

L. Let x be the number of units to be produced and sold Total Revenue Function, R(x) = 100xTotal Cost Function, C(x) = 75x + 8,750For the company, to breakeven R(x) = C(x) 100x = 75x + 8,750 100x - 75x = 8,750 25x = 8,750 $x = \frac{8,750}{25} = 350$ 

$$14. \quad p = 47 - (43 + 7(1))$$

11.

$$p = 47 - 50$$
$$p = -3$$

**19.** From the relation  $IRR = a\% + \left[\frac{NPV_A}{NPV_A - NPV_B} \times (b-a)\right]\%$ ,

where a = 10,  $NPV_A = 15,000 NPV_B = 6,000$  and b = 12.

#### EXAMINER'S COMMENT

MCQ and SAQ questions are spread to cover the entire syllabus.

Performance of candidates in the MCQ questions was not satisfactory although a reasonable number of them scored 15 marks and above.

A fairer conclusion was reached in the SAQ questions. The candidates' performance was a little bit better than the MCQ one.

#### SECTION B SOLUTION 1

Wage	Frequency	Class boundary	Cumm.freq (cf)
5-10	14	4.5-10.5	14
11-20	7	10.5-20.5	21
21-30	15	20.5-30.5	36
31-40	8	30.5-40.5	44
41-50	6	40.5-50.5	50
	50		
( )	20		

a. i.

$$p_{20} = L_{p20} + \left(\frac{\frac{20}{100}N - Cfb_{p20}}{f_{p20}}\right)C_{p20}$$

where  $L_{p20} = 4.5$ ,  $Cfb_{p20} = 0$ ,  $f_{p20} = 14$ ,  $C_{p20} = 10.5 - 4.5 = 6$ ,  $\frac{20}{100} \times 50 = 10$  (1mk)

$$p_{20} = 4.5 + \left(\frac{10 - 0}{14}\right) \times 6 \qquad (1mk)$$
  
= 4.5 + 4.29  
= 8.79 (1/2mk)

$$p_{80} = L_{p80} + \left(\frac{\frac{80}{100}N - Cfb_{p80}}{f_{p80}}\right)C_{p80}$$

where  $L_{p80} = 30.5$ ,  $Cfb_{p80} = 36$ ,  $f_{p80} = 8$ ,  $C_{p80} = 40.5 - 30.5 = 10$ ,  $\frac{80}{100} \times 50 = 40$  (1mk)

$$p_{80} = 30.5 + \left(\frac{40 - 36}{8}\right) \times 10 \qquad (1mk)$$
  
= 30.5 + 5  
= 35.5 (1/2mk)

b. Arithmetic mean 
$$=\frac{\sum x}{n}$$

$$=\frac{20+18+9+7+12+16+17+24+14+13}{10} \qquad (1/2mk)$$

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## Harmonic mean

$$HM = \frac{n}{\sum_{n=1}^{\infty} \frac{10}{0.05 + 0.056 + 0.111 + 0.143 + 0.083 + 0.063 + 0.059 + 0.042 + 0.071 + 0.077}}$$

Geometric mean

$$\sqrt{3.233522074 \times 10}$$

- (3.233522074  $\times$  10  $\,$  )  $^{/}$
- = 14.16
- $\therefore$  HM < GM < AM

## EXAMINER'S COMMENT

This question is on the Partition part of the Measures of Central Tendency. It tests candidates' knowledge on correct substitution into the relevant formulae for estimating the percentiles. It also tests candidates' knowledge of the relationship among the Arithmetic Mean, Geometric Mean and Harmonic Mean. Candidates' performance was just average. Over 70% of the candidates' attempted the question.

The only identified pitfall was the inability of some of the candidates to use the correct end of the relevant class boundary.

## SOLUTION 2

- a. i. The carrying rate is an aggregation of:
  - Cost of capital (8.50%);
  - Cost of storage (3.50%);
  - Cost of inventory risk (6.50%);
  - Cost of inventory servicing (0.25% + 1.00%)

Therefore, the carrying rate is

= 8.50 + 3.50 + 6.50 + 0.25 + 1.00 = 19.75% per year

i. The annual carrying costs of an item that cost **\20** per unit. Which is

 $2 = - \times 20 = - 3.95$ 

The carrying cost is ₦3.95 per unit per year.

For  $C_h = ic$ 

where  $C_h$  = carrying cost or hold cost

- i = The inventory carrying rate
- c = The unit price cost of the item.
- ii. The total annual carrying cost of 15 items that cost N20 per unit is

$$\boxed{2} = \frac{19.75}{100} \times 20 \times 15 = \textcircled{2}59.25$$

The total carrying cost is N59.25 per year

iii. The total carrying cost for 15 items that cost №20 per unit and are held in inventory for a period of 2 years would be:

$$\boxed{2} = \frac{19.75}{100} \times 20 \times 15 \times 2 = \textcircled{2}118.50$$

The total carrying cost over a 2 year period is ¥118.50

- b. For the time units for demand and carrying cost are the same. Other information provided are as follows:
  - D is 5000 per year
  - i is 0.20
  - C is N10 per item
  - $C_o$  is  $\aleph$ 25.20 per order

i. For  $Q = \frac{1}{2} = \frac{1}{2} = \frac{1}{2} = 35522322$ 

The EOQ for the item is 355 unit.

 $= 0.0712222250\frac{222}{2222} = 17.82222$ 

#### EXAMINER'S COMMENT

This question tests candidates' knowledge of the Inventory Control aspect of Operations Research. About 45% of the candidates attempted the question with just about 5% scoring above 6 marks.

The candidates' pitfall was in their inability to calculate the various costs involved. It is recommended that candidates should be well familiar with various costs under Inventory Control.

## SOLUTION 3

a.

Class interval	F	CF	Class boundary
(₦)			
10 - 19.9	11	11	9.95 - 19.95
20 - 29.9	24	35	19.95 - 29.95
30 - 39.9	54	89	29.95 - 39.95
40 - 49.9	150	239	39.95 - 49.95
50 - 59.9	108	347	49.95 - 59.95
60 - 69.9	78	425	59.95 - 69.95
70 - 79.9	51	476	69.95 - 79.95
80 - 89.9	20	496	79.95 - 89.95
90 - 99.9	4	500	89.95 - 99.95
	500		

Quartile deviation = 
$$\frac{Q_3 - Q_1}{2}$$

$$Q_{3} = L_{Q_{3}} + \left(\frac{\frac{3N}{4} - \sum f_{Q_{3}}}{f_{Q_{3}}}\right)C, ,$$

$$Q_3: \frac{3N}{4} = \frac{3X500}{4} = 375, L_{Q_3} = 59.95, \sum f_{Q_3} = 347, f_{Q_3} = 78, C = 10$$

$$Q_3 = 59.95 + \left(\frac{375 - 347}{78}\right) 10$$

$$= 59.95 + 3.5897 = 63.5397 \approx 163.54$$

$$Q_{\mathrm{l}} = L_{Q_{\mathrm{l}}} + \left(\frac{\frac{N}{4} - \sum f_{Q_{\mathrm{l}}}}{f_{Q_{\mathrm{l}}}}\right)C,$$

$$Q_{1} : \frac{N}{4} = \frac{500}{4} = 125, L_{Q_{1}} = 39.95, \sum f_{Q_{1}} = 89, f_{Q_{1}} = 150, C = 10$$
$$Q_{1} = 39.95 + \left(\frac{125 - 89}{150}\right)10$$
$$= 39.95 + 2.4 = 42.35 = \$42.35$$

Quartile deviation =  $\frac{63.54 - 42.35}{2} = \frac{21.35}{2}$ 

= 10.595≈₩1060.00k	

C 1	F	X	$\frac{X-47}{5}$	FU	$X - \overline{X}$	$\left X-\overline{X}\right $	$\mathbf{F}\left X-\overline{X}\right $
25-29	3	27	-4	-12	-18.36	18.36	55.08
30-34	5	32	-3	-15	-13.36	13.36	66.8
35-39	11	37	-2	-22	-8.36	8.36	91 <i>.</i> 96
40-44	9	42	-1	-9	-3.36	3.36	30.24
45-49	7	47	0	0	1.64	1.64	11.48
50-54	7	52	1	7	6.64	6.64	46.48
55-59	6	57	2	12	11.64	11.64	69 <i>.</i> 84
60-64	7	62	3	21	16.64	16.64	116.48
							(1mk)
	55			-18			488.36

$$= \mathbf{A} + \left(\frac{\sum FU}{\sum F}\right)C$$

$$2 = 47 + \left(\frac{-18}{55}\right)5$$

 $= 47 - 1.6364 = 45.3636 \approx 4536$ 

Therefore, the MEAN book sales = 4,536

ii. Mean Deviation = 
$$\frac{\sum F |X - \overline{X}|}{\sum F} = \frac{488.36}{55} = 8.879$$

Therefore, Mean Deviation ≈ 888 book sales

## EXAMINER'S COMMENT

Candidates' knowledge of Quartile Deviation and of the use of Coding factor to calculate Arithmetic Mean is tested in this question. About 75% of the candidates attempted the question with about 56% of them scoring above the average marks.

The notable pitfall here was in the inability of some candidates to use a Coding factor to calculate the Arithmetic Mean.

Candidates are advised to be well familiar with various methods of calculating the Arithmetic Mean.

#### SOLUTION 4

#### a.

i. Profit function = Revenue – Cost function  
i.e 
$$P(x) = R(x) - C(x)$$
  
 $P(x) = 85x - (1,550 + 10x + 0.3x^2)$   
At break-even point,  $P(x) = 0$ .  
 $85x - (1,550 + 10x + 0.3x^2) = 0$   
 $75x - 1,550 - 0.3x^2 = 0$   
where  $x = \frac{75 \pm \sqrt{(75)^2 - 4 \times 0.3 \times 1550}}{2 \times 0.3}$   
 $x = \frac{75 \pm \sqrt{3,765}}{0.6}$ 

$$x = \frac{75 \pm 61.34}{0.6}$$

$$x = 227.2 \text{ and } x = 22.8$$
But  $0 \le x \le 200$ ,  
 $\therefore x = 22.8$ 
Hence, in order to make a profit, 23 or more clothing must be produced.  
i.e  $\mathbb{Z} \ge 23$ 

ii.

. At the turning point (for maximum, minimum or inflection point),

$$\frac{dP}{dx} = 0$$
  

$$\therefore 75 - 0.6x = 0$$
  

$$x = \frac{75}{0.6} = 125$$
  

$$\frac{d^2P}{dx^2} = -0.6 < 0.$$

This shows that the profit is maximum when the quantity x = 125. The price at maximum profit can be obtained from

$$2 125 = \frac{2(125)}{125}$$

$$2 125 = \frac{85 \times 125}{125}$$

$$2 125 = 2285$$

- iii. Maximum profit at  $\square = 125$  is  $\square 125 = 75 \times 125 - 1,550 - 0.3 \times 125^2$   $= 75 \times 125 - 1,550 - 0.3 \times 125^2$  = 9,375 - 1,550 - 4,687.= 3,137.5
- iv. The price at maximum profit can be obtained from

$$p(125) = \frac{R(125)}{125}$$

$$\mathbb{E} p(125) = \frac{85 \times 125}{125}$$

$$p(125) = Le 85$$

b. i. Elasticity of demand is

$$\eta = \left(\frac{-p}{q}\right) \times \left(\frac{dq}{dp}\right)$$
  
where  $p = \sqrt{2,500-q}$ ,  
 $q = 2,500-p^2$   
 $\frac{dq}{dp} = -2p$   
 $\therefore \eta = \left(\frac{-p}{q}\right) \times (-2 \times p)$   
When  $q = 2,025$   
 $p = \sqrt{2,500-q}$   
 $p = \sqrt{2,500-2,025}$   
 $p = 21.79$   
 $\eta = \left(\frac{-21.79}{2,025}\right) \times (-2 \times 21.79)$ 

$$\eta = \frac{950.24}{2,025} = 0.47$$

- ii. Since the elasticity of demand,  $\eta = 0.47 < 1$ , this shows that it is an inelastic demand and at a price of Le21.79, a 1% increase in price would decrease demand by only 0.47%.
- iii. To maximize revenue, we solve for p when  $\eta = 1$ .

$$\therefore \eta = \left(\frac{-p}{q}\right) \times \left(\frac{dq}{dp}\right) = 1$$
$$q = 2,500 - p^2$$

$$\frac{dq}{dp} = -2p$$

$$\left(\frac{-p}{2,500 - p^2}\right) \times (-2p) = 1$$

$$2,500 - p^2 = 2p^2$$

$$p^2 = \frac{2,500}{3}$$

$$p = \sqrt{833.33}$$

$$p = Le28.87$$

#### EXAMINER'S COMMENT

This question is on the application of equations to Cost, Revenue, Economics and Management problem. It tests the candidates' knowledge of Turning and Break-Even points, Elasticity of Demand and Maximum profit.

About 40% of the candidates attempted the question with about 7% of them scoring above average. Inability of some of the candidates' to know that Elasticity of Demand is 1.0 when the Revenue is Maximum was the only notable pitfall of some of the candidates that attempted the question.

SOLUTION 5

a.i. Let x<sub>1</sub> be number of units of product X that will be produced

Let x<sub>2</sub> be number of units of product Y that will be produced for all correct Let x<sub>3</sub> be number of units of product Z that will be produced

We have to develop a linear programming formulation. The linear programming formulation of the product mix problem is:

Maximize: 22? + 6? + 2?

**Subject to:**  $102 + 22 + 2 \le 100$ 

 $72 + 32 + 22 \le 72$ 

2?	42	?	80
?,?	, ?	0	

ii. We introduce slack variables 2, 2 2222 to make the inequality become equation.

Thus, the problem can be stated as

Maximize: 22 🛛 62 2? Subject to: ? 102 22 ? 100 7? 32 22 ? 72 22 4? ? ? 80 ?,?,?,?,?,?,? 0

## From the above equation, the Simplex table can be obtained

	Basic	?	22	6	2	0	0	0
СВ	Variables	XB	?	?	?	?	?	?
0	?	100	10	2	1	1	0	0
0	?	72	7	3	2	0	1	0
0	?	80	2	4	1	0	0	1
	???		- 22	- 6	- 2	0	0	0

## b. Let the dual variables be $\mathbb{Z}$ , $\mathbb{Z}$ ; then the dual problem is

Minimize	?	452	30 🛛
Subject to:	22	?	40
	32	82	240 <b>105</b>

42 + 52 ≥ 200 2,2 ≥ 0

## EXAMINER'S COMMENT

This question is on Linear Programming (LP) Problem. It tests candidates' knowledge on the formulation of LP Problem from worded descriptions. It also tests their knowledge in the setting up of simplex initial tableau in which decision and slack variables are involved.

About 35% of candidates attempted the question out of which less than 10% scored just above the average.

A number of the candidates had problem with the setting up of the initial simplex tableau. Many of them did not know what is meant by dual problem.

## **QUESTION 6**

a. i. #The table is not balanced because demand is not equal to supply.

2 Demand = 5,600 + 6,700 + 3,700 or 16,000

Supply = 5,000 + 4,500 + 5,500 or 15,000

Hence, Dummy for the supply must be created to provide the deficit of

16,000 – 15,000 or 1,000

Introducing the Dummy now

Steps in constructing the tableau by Vogel's Approximation Method:

- Calculate the penalty for each row & column which is the difference between the two least costs in the row & column
- Chosen the row/column with the highest penalty and allocate maximum possible to the least cost in the row/column chose
- Ignore the row/column in 2<sup>nd</sup> bullet and repeat until all allocations are satisfied.

	(Destination) Distributors				
(Source/origin)	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	(Availability)	Row penalty
Depots				Supply	
Х	20	40	25	5,000	5,5,20,20
	3,800	1,200	_	1200	
				0	
Y	30	50	40	4,500	10,10,20,20
	-	4,500	_	0	
Z	35	60	15	5,500	20,20,25,-
	1,800	-	3,700	1,890 0	
	0	0	0	- <del>1,00</del> 0	0,-,-,-
Dummy	-	1,000	-	0	
Demand	5,600	<u>-6,700</u>	3,700		
	3,800	5,700	0	16,000	
	0	0			
Column	20,10,10,	40,10,10,	15,10, -		
Penalty	10	10			

#Number of rows, n = 3, Number of columns, m = 3

Test for feasibility using n + m - 1 = filled cells

n + m - 1 = 3 + 3 - 1 = 5

Since the number of filled cells = 5 = n + m - 1, therefore, the solution by Vogel's Approximation Method is feasible

ii. Initial basic total transportation cost =  $(3,800 \times 20) + (1,200 \times 40) +$ 

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$$(4,500 \times 50) + (1,800 \times 35) +$$
  
 $(3,700 \times 15) + 1000 \times 0$   
= 76,000 + 48,000 + 225,000 + 63,000  
+ 55,500 + 0 = GH¢467,500  
AT/212/PII
|             | Pro | jects |    |    |
|-------------|-----|-------|----|----|
| Contractors | Х   | Y     | Ζ  | W  |
| 1           | 11  | 14    | 16 | 19 |
| 2           | 15  | 15    | 19 | 11 |
| 3           | 12  | 9     | 8  | 17 |
| 4           | 19  | 17    | 12 | 10 |
| 4           | 19  | 17    | 12 | 10 |

b.

Step (i): Subtract row minima i.e. subtract the smallest entry in each row from each entry in that row

	Pr	Projects		
Contractors	Х	Y	Ζ	W
1	0	3	5	8
2	4	4	8	0
3	4	1	0	9
4	9	7	2	0

Step (ii): Subtract column minima i.e. subtract the smallest entry in each column from each entry in that column

	Projects			
Contractors	Х	Y	Ζ	W
1	0	2	5	8
2	4	3	8	0
3	4	0	0	9
4	9	6	2	0

Step (iii): Cover all zeros with the minimum number of lines

	Projects			
Contractors	Х	Y	Ζ	W
1	Ø	2	5	8
2	4	3	8	0
3	4	0	0	-9
4	9	6	2	d

Since the number of lines is not equal to number of rows/columns

Step (iv): Create additional zero by subtracting the smallest element that isn't covered by a line from all the uncovered elements and add it to any element that is covered twice



Since the number of lines = number of rows/columns

This implies that optimal assignment can be made:

Assign project X to contractor 1

Assign project Y to contractor 3

Assign project Z to contractor 4

Assign project W to contractor 2

Total cost of the 4 projects =

Project X to contractor 1will cost N11million

Project	Y to contractor 3 will cost ¥9million
Project	Z to contractor 4 will cost ¥12million
Project	W to contractor 2 will cost <b>\11</b> million
	Total = <del>N</del> 43million

#### EXAMINER'S COMMENT

Candidates' knowledge of solving transportation problem using the Vogel's Approximate Method and the use of Hungarian or Reducing-Cost Matrix method to obtain the total minimum cost of projects is tested by the question.

About 65% of the candidates attempted the question with about 30% scoring a little above the average mark.

Candidates' pitfalls here include not knowing that the problem is not balanced and their inability to introduce the appropriate Dummy.

It is advisable, that candidates should know the condition under which a problem is balanced and the condition under which the problem is feasible.

## THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA



## ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA SEPTEMBER 2021 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 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.

## TUESDAY, 28 SEPTEMBER, 2021

## DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

#### ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA PART II EXAMINATIONS – SEPTEMBER 2021

#### 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. Recorded facts in respect of sales made in a supermarket is an example of
  - A. Recorded sales
  - B. Sales information
  - C. Data
  - D. Transaction record
  - E. Sales record
- 2. Which of the following is a characteristic of information?
  - A. Wholesome
  - B. Informative
  - C. Meaningful
  - D. Unrelenting
  - E. Vague
- 3. The process of bringing data to life is known as data
  - A. Rebirth
  - B. Origination
  - C. Recording
  - D. Sourcing
  - E. Recycling

4. Data obtained from interview or questionnaire is said to have a .....source

- A. Primary
- B. Secondary
- C. Open
- D. Closed
- E. Hybrid

- 5. What is the main purpose of producing information?
  - A. To inform managers
  - B. For assisting managers
  - C. For direction
  - D. Decision making
  - E. To ensure data is processed
- 6. What is transaction data?
  - A. Recorded facts in respect of transactions that occurred or occurring
  - B. Facts in respect of operational activities
  - C. Facts needed for master-file processing
  - D. Current active data
  - E. Obsolete data
- 7. In computing, the basic unit of storage is:
  - A. Bit
  - B. Byte
  - C. Kilobyte
  - D. Megabyte
  - E. Gigabyte
- 8. In computing, 1 kilobyte is equal to ...... bits
  - A. 1000
  - B. 1024
  - C. 3072
  - D. 8000
  - E. 8192
- 9. A file is a ..... records
  - A. Collection of
  - B. Sequence of
  - C. Series of
  - D. Group of
  - E. Collection of related
- 10. A database consists of ...... data
  - A. Contiguous
  - B. Serial
  - C. Combined
  - D. Structured
  - E. Grouped

11. Which of the following is **NOT** an hexadecimal digit?

- A. A
- B. 0
- C. 3
- D. 4
- E. 11

12. Convert 101<sub>2</sub> to a base 8 number.

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7
- 13. Bit is an acronym for
  - A. Business information technology
  - B. Business information technique
  - C. Business in information technology
  - D. Business and information technology
  - E. Binary digit
- 14. How many bits has a nibble?
  - A. 2
  - B. 3
  - C. 4
  - D. 5
  - E. 8
- 15. One reason a computer output may be wrong is, if the program used for the processing is not
  - A. Executing properly
  - B. Communicating with the display unit or printer
  - C. Aligning with the data
  - D. Logically correct
  - E. Sequentially arranged

- 16. Which of the following is **NOT** a microcomputer?
  - A. IPAD
  - B. Notebook
  - C. Laptop
  - D. Palmtop
  - E. Desktop
- 17. Computer is said to be portable if it
  - A. Has a small size
  - B. Can be moved around with ease
  - C. Can be carried in a bag
  - D. Is convenient to be offered as a gift
  - E. Can be taken along in travel
- 18. An advantage derived from using a computer is:
  - A. It is completely secured
  - B. It allows for backup
  - C. It is portable
  - D. It provides accurate results
  - E. It can be used anywhere
- 19. In computing, a backup is a term used to describe
  - A. Backlog of data and information
  - B. Extra copy of data and information
  - C. Storage for data and information
  - D. Auxiliary support for data and information
  - E. Data and information stored on disk
- 20. Which of the following is **NOT** a component of the Central Processing Unit?
  - A. Processor
  - B. Memory
  - C. Arithmetic and Logical Unit (ALU)
  - D. Control unit
  - E. System unit
- 21. The number of bits in a Word on a binary Computer is:
  - A. 4
  - B. 8
  - C. 16
  - D. 32
  - E. 64

- 22. Software that makes resources of a computer available for use is:
  - A. Application software
  - B. Accounting software
  - C. Spreadsheet software
  - D. System software
  - E. Desktop publishing software
- 23. The function of an operating system is:
  - A. Memory management
  - B. Disk formatting
  - C. Mouse installation
  - D. File saving
  - E. Program typing
- 24. Operating system that allows multiple users simultaneously is called
  - A. Single user system
  - B. Single tasking system
  - C. Multi user system
  - D. Multitasking system
  - E. Network system
- 25. Application package that performs more than one function is referred to as
  - A. Customised package
  - B. In-house package
  - C. Altered off the shelf package
  - D. Integrated package
  - E. Off-the-shelf package
- 26. In Windows environment, the components of the desktop are
  - A. Icons, Title bar, and screen display
  - B. Menu bar, background, and icons
  - C. Task bar, Title bar, and Icons
  - D. Menu bar, background, and Task bar
  - E. Task bar, background, and icons
- 27. Which of the following is a characteristic of star topology?
  - A. There is point to point connection between server and clients
  - B. When one client breaks down it affects all other clients
  - C. When server breaks down communication continues between clients

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- D. Communication between the clients is not necessarily via the server
- E. Server cannot control the network
- 28. An example of simplex transmission system is:
  - A. Radio broadcast
  - B. Walkie-talkie communication
  - C. Telephone conversation
  - D. Human computer interaction
  - E. Satellite communication
- 29. In data transmission system, a protocol is:
  - A. An order for doing things
  - B. A set of rules guiding parties involved in communication
  - C. A set of instructions for network systems
  - D. Rules for communication on internet
  - E. Operating system commands
- 30. How many layers has an Open System Interconnection model?
  - A. 102
  - B. 9
  - C. 8
  - D. 7
  - E. 6

## 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. When there is the presence of more than one task belonging to different users in the memory for processing at the same time by a single processor, the processing technique is called .....
- 2. A computer network that links devices within a building or group of adjacent buildings within a limited radius is known as.....

- 3. A ..... is an arrangement of interconnecting devices in which each device connects to exactly two other devices forming a single continuous pathway for signals through each device
- 4. The computing terminology for a class of electronic devices that solve problems by processing information in discrete form is called .....
- 5. The system that allows a user to perform more than one computer task at a time in such a way that the operating system is able to keep track of the tasks and go from one to the other without losing information is known as .....
- 6. A sequence of logically arranged statements expressed in a computer language is known as ......
- 7. The collection of machineries used in computer operations is generally referred to as.....
- 8. Supporting machineries for computer operations usually attached to the system unit are known as .....
- 9. A ..... is a computer output that cannot be touched physically
- 10. A diamond-shaped box depicts ..... in a flowchart
- 11. Computer processing that occurs instantaneously as data input occurs is known as .....
- 12. A block of text is ..... when the left mouse button is pressed down and dragged over it
- 13. A ready-made suite of programs for solving general computing problems is called a.....
- 14. In programming, a first or preliminary version of a program from which other versions are developed is called .....
- 15. The fraudulent practice of sending e-mails claiming to be from reputable companies in order to induce individuals to reveal personal information is called
- 16. In computing, a ..... is any malware which misleads users of its true intent
- 17. A Computer program that enables user to create and edit text files is called ......
- 18. The data transfer method that is characterised by a continuous stream of data in the form of signals accompanied by regular timing signals generated by some external clocking mechanism is called .....

- **19.** The web page that is displayed on entering a website which contains hyperlinks to other webpages is called .....
- 20. A software that allows a user to surf the internet is called .....

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

- a. i. Explain the term "distributed processing system" (1½ Marks) ii. List **FOUR** advantages and **FOUR** limitations of distributed processing Systems. (4 Marks)
- b. You are an accounts supervisor in an electronics manufacturing company. The management of your company has just decided to computerise its accounting operations.

State **THREE** factors that you will recommend for the consideration of the systems development team in your company in determining the choice of storage devices and media for the new computerised system. (3 Marks)

c. What does the term "i/o devices" stand for? State its main functions and **TWO** examples (4 Marks) (Total 12½ Marks)

## QUESTION 2

a. Define software and state **TWO** types to illustrate your definition.

(3<sup>1</sup>/<sub>2</sub> Marks)

- b. As an accountant in your organisation, prepare a checklist of **FIVE** points you would wish to discuss with the manager of the computer bureau on selecting an application package for stock control and stock ledger works. (5 Marks)
- c. List **TWO** cost advantages accruing to an organisation from the purchase of software packages rather than writing software in-house. (4 Marks) (**Total 12½ Marks**)

#### **QUESTION 3**

a. State **FIVE** merits of the use of internet in a business organisation. (2<sup>1</sup>/<sub>2</sub> Marks)

- b. State **FOUR** points you will consider as features of an efficient information system (4 Marks)
- c. Explain **THREE** ways, information systems may differ from one organisation to the other. (6 Marks)

(Total 12½ Marks)

#### **QUESTION 4**

a. Some years back, Ade limited, one of the leading oil companies computerised all their operations, yet, processing problems are still being experienced.

Identify and explain **FIVE** of the likely factors contributing to their system problems. (5 Marks)

b. Your company is about to be supplied with a super microcomputer that supports five other computers. You are asked to give your opinion on merit and demerit of distributing the other five computers to other departments located within the headquarters (as against other branches outside the headquarters).

#### **Required**:

State **FIVE** merits and **ONE** demerit of the above scenerio. (6 Marks)

c. State **THREE** features of an electronic data processing system (1½ Marks) (Total 12½ Marks)

#### **QUESTION 5**

- a. Explain the term "data collection" (2½ Marks)
- b. Highlight **TWO** weaknesses and **THREE** strengths for each of the following methods of data gathering:
  - i. interviewing
  - ii. questionnaire
  - iii. sampling and measuring
  - iv. observation

(10 Marks) (Total 12½ Marks)

#### **QUESTION 6**

a. Explain the processes of **TWO** methods of system changeover during systems implementation and state **TWO** advantages of each of the methods stated.

(6 Marks)

b. i. What is file conversion?

(2½ Marks)

ii. State **FOUR** factors that would be considered in developing a procedure for file conversion. (4 Marks)

(Total 12½ Marks)

### **SECTION A:**

PAI	RT 1	Multiple Choice Solution
1	С	
2	С	
3	В	
4	A	
5	D	
6	A	
7	В	
8	E	
9	E	
10	D	
11	E	
12	С	
13	E	
14	С	
15	D	
16	A	
17	В	
18	D	
19	В	
20	E	
21	С	
22	D	

- 23 A
- 24 C
- 25 D
- 26 E
- 27 A
- 28 A
- 29 B
- 30 D

### **EXAMINER'S COMMENTS**

The thirty questions supplied in this section are well prepared. The questions cover almost all sections of the syllabus.

The standard of the questions is within the strength of the questions is within the strength of the students although very high. The performance is encouraging.

#### PART II SHORT-ANSWER SOLUTION

- 1. Multitasking
- 2. Local Area Network (LAN)
- 3. Ring Topology
- 4. Digital Computer
- 5. Time-sharing system/Multiprogramming
- 6. Computer program
- 7. Hardware
- 8. Peripherals
- 9. Softcopy
- 10. Decision Making

- 11. Real-time processing/online processing
- 12. Highlight/select
- 13. Application package
- 14. Prototype
- 15. Phishing
- 16. Trojan horse
- 17. Editor (text)
- 18. Synchronous transmission
- 19. Home page/web page
- 20. Browser (web)

## **EXAMINER'S COMMENTS**

The standard of these twenty questions is just moderate and it covers the entire syllabus. The performance is poor.

## SECTION B

Solutions to Theory Questions

ai) A distributed processing system is one in which computing power is distributed over a network of computers. That is, processing could be done at the terminals. For example, a bank's central computer at the headquarters may be linked to all the computers at its branch offices. Each branch could store and process its own data on its own computer while the data is accessible from any of the other computers of the other branches.

OR

This is a kind of processing whereby processing facility is made available at a number of sites instead of a single computer centre. In distributed processing, each location has its own computers to handle local processing and the remote sites are linked to each other and the central server at the head office.

## ii) Advantages of Distributed Processing Include:

- (1) Easy access to data
- (2) Timeliness of information necessary for processing

- (3) Central control of data still possible
- (4) Quick decision possible due to the fact that a terminal does not depend other to process its own data.
- (5) It minimises monopoly of Information processing
- (6) It reduces delay in obtaining output from the computer
- (7) Information are provided as at when required
- (8) There is less risks of loss of data since the remote locations are linked and backed up each other
- (9) More modules can easily be added or deleted from the system.

## Limitations of Distributed Processing Include:

- (1) Overhead cost of connections and communication may be high
- (2) May require very tight security measures to prevent unauthorized access to data.
- (3) Implementation may be highly technical
- (4) May not be easy in an environment with poor or inadequate infrastructures
- (5) It is very expensive to implement
- (6) Duplication of information by different locations within the same organization
- (7) There is reduction in control of data
- (8) Increase data storage cost due to duplication of data in various locations.
- (b) The following factors will determine the choice of storage devices and media;
  - (1) Volume of data to be processed in which case high capacity storage will be chosen for large volumes
  - (2) Frequency of processing, so that durability is a significant factor.
  - (3) The type of hardware already in use
  - (4) Processing Speed: Magnetic tapes are fast for batch processing when large volume of transaction data are processed in each run.
  - (5) Cost of devices so that only those that are affordable will be bought.
  - (6) File organization methods required. For example; where indexedsequential file organization is necessary as in sales analysis, a disk will be preferred, while it is more economical to use tape for files that are strictly sequential.

## (c) Meaning

I/O devices stand for input-output devices which refer to devices that can perform the function of both input and output, that it can be used to enter data into a computer and retrieve data from a computer.

## Functions of I/O Device include:

1. Processor Communication: This involves the interference of data between the processor and an I/O module, accepting and decoding commands sent by the

processor, reporting of currents status and ability to recognize its own unique address.

- 2. Device Communication: It performs standard device communications, such as reporting of status
- 3. Control and timing: It is capable of managing data flow between a computer's internal resources and any connected external resources
- 4. Data buffering: It manages the speed discrepancy that exists between the speed of transfer of data, the processor, memory and peripheral devices
- 5. Error correction: It detects error or data base and reporting them to the processor. The error could be mechanical such as printers having paper jam.

### Examples of 1/0 devices include:

- 1. Hard disk drive
- 2. Sound card
- 3. Flash drive
- 4. Modem
- 5. Touch screen
- 6. Digital camera
- 7. Floppy diskette drive
- 8. Compact Disk Read only memory (CD-ROM)

#### EXAMINER'S COMMENTS

The typing is ok and there are no errors except 1(c) where the question treated I/O device as consistency of two elements. This has been comments in the insight. The marking treated I/O devices as consisting of only one element.

#### 2. (a) **Computer Software**

Software is a generic term for all programs that run on the hardware system and accompanying documentation.

Software derives the hardware and it is designed to exploit and provide the potential capabilities of the hardware.

#### Types of software include:

- 1. System Software
- 11. Application Software (Packages)
- 111. Communication Software
- (B) 1. Cost of package
  - 2. Memory space required for installation
  - 3. User friendliness
  - 4. Maintenance agreement
  - 5. Running cost

- 6. Training requirements
- 7. Availability of after sales support services
- 8. Possibility of integration with other systems or packages
- 9. Type of hardware and operating system needed for the software.
- (C) 1. No need to employ programmers
  - 2. Cost of implementation will reduce
  - 3. More application areas are covered with application packages, thus reducing future costs of acquiring software to cover such areas

### **EXAMINER'S COMMENTS**

This tests candidates' understanding on different types of computer software. It demands for the advantages and selection policies of application packages. Over 65% of the candidates attempted this question and the performance is very good. Types of software is a popularly aspect of the syllabus, so candidates are advised to pay special attention in further examinations.

Recommended textbooks and ICAN study packs should be consulted.

## 3. (a) Merits of using internet include:

- 1. Globalization
- 2. Internet usage never ceases
- 3. Increased online sales
- 4. Potential customer base
- 5. More clients
- 6. Enhanced customer service
- 7. Better networking opportunities
- 8. Reduced expenses
- 9. Increased productivity

## (b) Features of an efficient information system include:

- (1) Should provide reliable information
- (2) Should be cost effective
- (3) Must have easy retrieval facility
- (4) Must incorporate appropriate security control
- (5) Must have good storage facility
- (6) The existence of procedures for collecting data
- (7) The existence of procedures which sort and classify data, carry out arithmetic and logical operations on the data, holds data in the form of records for immediate or future use, summarise data and check results for accuracy

- (8) The existence of procedure for storage of data for both immediate and future use
- (9) The existence of procedures for communicating the processed data to appropriate managers.
- (c) 1) Different organizations may require different information needs.
  - 2) Nature of Information systems may differ because of different organizational objectives.
    - 3) The size of an organization will affect the volume of data entering an information system. Therefore an organization may have a large information system compared to the small information system in another organization.
    - 4) The method of data processing in an organization also affects the IS in such an organization and since all organizations don't use the same method of data processing their information systems are bound to be different.
    - 5) In computerized environment, the hardware system configuration may also affect the nature of information system.

## EXAMINER'S COMMENTS

This question tests candidates knowledge on the merits of the most recent technology, the internet and information system. Average number of candidate attempted this question. This is strange because everything rotates around the internet and information system.

The major pitfall is that student took efficient information system for good information. Information is just a part of information system. The performance is not encouraging. For further examinations, student should pay more attention to the Network system.

- 4a. a) Data may not be properly vetted before processing.
  - b) Computer programs used for processing may contain bugs.
  - C) System design may be inadequate.
  - d) Hardware systems may not be compatible with nature of work.
  - e) Software systems may not be compatible with nature of work.
  - f) Hardware or software systems may not be properly installed.
  - b. Since there is a supper micro computer that can support five microcomputers and since the other 5 micro computers were distributed to some departments within the headquarters instead of distributing to the branch offices. Then, what is required is Merits and Demerits of a Local Area Network (LAN) over a Wide Area Network (WAN)

### Merits of LAN over WAN

- 1) Distortion of data usually found in data transmitted over long distances is eliminated
- 2) It is relatively cheap
- 3) It does not require the use of Modems as connection of equipment is done using cables.
- 4) It is not as complex as WAN
- 5) It is easy to Install and Implement.
- 6) It is better secured

## Demerits of LAN when compared to WAN.

1) Area of coverage is restricted.

## (c) The features of electronic data processing include:

- i. High speed of operation
- ii. Large storage capacity
- iii. Accuracy
- iv. Control
- v. Versatility
- vi. Flexibility
- vii. Large volumes of data can be handled
- viii. It is a programmable device
- ix. It is consistent in its mode of operation
- x. It is reliable
- xi. Diligence: It does not suffer from the human traits of tiredness and loss of concentration

## **EXAMINER'S COMMENTS**

This question tests candidates' understanding on operations and distribution processing technique. Only few students attempted this question, and performance is very poor.

The major pitfall is that student did not understand the scenario. The scenario is demanding for

- 1. Causes of poor operations and
- 2. Identification of distributing technique.

Students will need to pay more attention to (a) Methods of good processing using excellent input and output elements.

A good storage device is also very important. Also student should distinguish between decentralized and distributed processes.

- (a) **Data collection** is the act of gathering data from different originating points to the processing center
  - (b)(i) **Interview** is the face-to-face question and answer session between the analyst and the members of staff of the department involved.

## Advantages (strengths)

- a) Cheap
- b) Fast

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c) Good for getting other peoples opinion

### Dísadvantages (weaknesses)

- a) Success depends on interviewer's skill
- b) People may claim to perform roles which they do not
- c) Not suitable when respondents are in diverse areas
- ii) **Questionnaires** are carefully prepared, documented questions which are sent to users to seek for their opinions and views about the present system.

## Advantages (strengths)

- a) It has wider coverage
- b) Analyst can use his time saved for other things
- c) The questions are well planned.

## Dísadvantages (weaknesses)

- a) Very expensive
- b) It is time consuming
- c) Some answers may prove useless because the questions have been misunderstood.
- d) Response may be slow in coming and may prove low.

## iii) Measuring and sampling

Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate characteristics of the whole population.

## Advantages (strengths)

- a) Cheap
- b) Unbiased
- c) It is a faster method of collecting facts.
- d) It forms the basis of any research design

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#### Dísadvantages (weaknesses)

- a) It is sometimes tedious
- b) It may be unrepresentative of the overall system
- iv) **Observation** is a means by which the analyst watches and notes how people handle documents and how things are done in a department under different conditions.

#### Advantages (strengths)

- a) The method is effective when objectivity is assented
- b) It is simple
- c) It is economical

#### Disadvantages (weaknesses)

- a) Observation takes a lot of time
- b) The behavior of people being observed may be modified to negatively influence the process being observed.
- c) It requires special skill to observe.

#### EXAMINER'S COMMENTS

This question tests candidates' understanding on method of Data collection.

The question is very popular among students as over 85% of the student attempted it. The performance is very encouraging. This question is not necessarily an I.T question, it is purely a management question.

6. a) Three methods of changeover from the old system to the new system are; Direct, Parallel and Pilot.

**Direct changeover** is the implementation of the new system and the immediate discontinuance of the old system.

#### Advantages

- i) The system is relatively simple
- ii) Implementation period is short
- iii) It may not be expensive

**Parallel changeover** means operating both the old and the new system simultaneously for some period of time before the old system is dropped.

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#### Advantages

i) The outputs from the two systems can be compared and the differences reconciled.

- ii) The new system will be properly tested before it is finally adopted.
- iii) The new method fails; management could fall back to the old method.

**Pilot changeover**: In pilot change over, the implementation of the new system is gradual. The system could be implemented, for example, in a particular department within the organization. If it proved workable and reliable there, then it could be introduced in other departments.

## Advantages

- i) The method allows for a well-tested system.
- ii) The risk of a system's failure is localized.
- iii) The problems identified in the system can be corrected before further implementation.
- bi) **File conversion** is the process of transferring the information required for a system from the old manual files to the new computer files.
- bii) **Factors to be considered** to develop a procedure for file conversion include:
  - i) File integrity i.e. to ensure that the data is safe from corruption or loss.
  - ii) File security i.e. to protect the data from being accessed by unauthorized persons or outright loss.
  - iii) Conversion time. This is to ensure that conversion is not done during peak normal work load period so as not to cause disruption of business activities.
  - iv) The cost of conversion should be considered.
  - v) The length of time it takes to convert should also be considered.

## EXAMINER'S COMMENTS

This question tests candidates' knowledge on Computer System Development. It demands for the technique of file conversion. It is fairly technical. It appears that students didn't like it. Only few students attempted it and the performance is very poor.