THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
MARCH 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, 30 MARCH, 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 – MARCH 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   The implication of the entity concept to a sole trader is that the

    A.   Business can sue and be sued separately
    B.   Private use of business assets reduces owner's capital
    C.   Owner cannot own private assets
    D.   Liability of the owner is limited
    E.   The owner of the business and the business are the same

2   In the final accounts of not-for-profit making organisation, capital expenditures are recorded in

    A.   Profit or loss account
    B.   Statement of financial position
    C.   Subscription account
    D.   Income and expenditure account
    E.   Bar account

3.   Making an allowance for receivables is an example of which concept?

    A.   Prudence
    B.   Accruals
    C.   Going concern
    D.   Mater
    E.   Consistency

Use the following information to answer questions 4 and 5

Peter and Paul are in partnership sharing profits and losses in ratio 2:3. On 1 January, 2019, they admitted Paulina injecting ₦1,200,000 as capital.

The following also took place at that date

(i)   Goodwill was valued at ₦4,000,000
(ii)   The new profit sharing ratio is to be 3:6:1
(iii) Property is valued upwards by ₦3,500,000

Peter had a balance of ₦4,500,000 credit in his capital account prior to adjusting the accounts. Goodwill is not to be retained in the books.

4.   The total amount of goodwill and revaluation surplus to be credited into Paul's capital account is

   A.   ₦4,500,000
   B.   ₦3,000,000
   C.   ₦2,400,000
   D.   ₦2,100,000
   E.   ₦1,600,000

5.   The balance in Peter's capital account after the adjustment is

   A.   ₦7,500,000
   B.   ₦6,800,000
   C.   ₦6,300,000
   D.   ₦5,900,000
   E.   ₦5,600,000

6.   Which of the following items is **NOT** correctly classified as an element of financial statement?

   (i)   Cash and cash equivalent - Asset
   (ii)   Loan Note - Equity
   (iii) Current income taxation payable - Liability
   (iv)   Retained earnings – Income

   A.   II
   B.   I and III
   C.   IV and II
   D.   II and IV
   E.   IV and III

7. Which of the following is **NOT** a financing item in a statement of cash flows?

A. Cash proceeds from issues of shares
B. Cash repayments of amount borrowed
C. Cash payment to owners of equity
D. Cash payment to acquire equity or debt instruments
E. Cash proceeds from issue of loan notes or other long term borrowing

8. Which of the following items is correctly matched in accordance with IASB Conceptual Framework?

S/N	Enhancing Qualitative Characteristics	Fundamental Qualitative Characteristics
A.	Timelines	Relevance
B.	Verifiability	Going concern
C.	Faithful representation	Comparability
D.	Neutrality	Faithful representation
E.	Understandability	Accruals

9. The net profit of Adewale ventures for the year ended 31 December is GH 1,051,000 and he injected capital of GH 100,000 into the business during the year. At the end of the year, there was an increase in net assets of the company by GH 733,000.

The drawings made during the year by Mr. Adewale is

A. GH 218,000
B. GH 418,000
C. GH 1,151,000
D. GH 1,684,000
E. GH 1,884,000

10. The following is the extract from the financial statement of TEMA Limited.

	GH¢'000
Inventory	200
Receivables	300
Cash and cash equivalent	100
Trade payables	300
Loan notes (5 years)	300

The current and acid test ratios of the company is

	Current Ratio	Acid Test Ratio
A	1.33:1	0.67:1
B	1:1	0.67:1
C	2:1	1.33:1
D	1:1	1.33:1
E	2:1	0.67:1

11. A financial statements prepared under IFRS, which statement contains the proceeds from sales of non-current assets sold during year?

    A. Statement of cash flows
    B. Statement of changes in equity
    C. Statement of financial position
    D. Statement of profit or loss and other comprehensive
    E. Value added statement

12. In a Not-for-profit organisation, a debit balance on the subscription account is reported on

    A. Receipt and payment account
    B. Profit or loss account
    C. Income and Expenditure account
    D. Statement of financial position
    E. Trading Account

13. Agege social club has the following information as at 31/12/18
Subscription in advance as at 1/1/18   -   L$50,000
Subscription collected during the year -   L$400,000
Subscription in advance as at 31/12/18 -   L$25,000

The amount of subscription that should be recognised as income for the year ended 31/12/2018 is

A. L$475, 000
B. L$450, 000
C. L$425, 000
D. L$400, 000
E. L$375, 000

14. Which of the following is **NOT** an account prepared by a Not-for-profit organisation?

A. Receipts and Payment Account.
B. Statement of Financial position
C. Branch Inventory Account
D. Income and Expenditure Account
E. Bar Trading Account

15. An employee is entitled to 5% commission on the surplus of the club after charging the commission. What is the commission if the surplus was Le 50,400?

A. Le 2,650
B. Le 2,540
C. Le 2,520
D. Le 2,500
E. Le 2,400

16. A capital receipt by a club or an association comprises of the following; **EXCEPT**

A. Entry Fees
B. Government grants
C. Endowments
D. Annual Subscription
E. Legacies

17. The necessary accounting entries required to record the amount of calls on shares not paid by the shareholders are

	DR	CR
A.	Call on shares not paid account	Call on shares account
B.	Call on shares in Arrears account	Call on shares account
C.	Ordinary shares account	Call on shares in arrears account
D.	Call on shares in arrears account	Ordinary shares account
E.	Cash book	Call on shares in arrears account

18. In which ledgers can data relating to discount be found?

A) Cash book
B) Private ledger
C) Sales ledger
D) Norminal ledger
E) Public ledger

19. The necessary accounting entries required to record the amount refunded to the applicants on rejected ordinary shares are

	DR	CR
A.	Cash book	Application and allotment account
B.	Cash book	Ordinary shares account
C.	Application and allotment account	Cash book
D.	Ordinary shares account	Cash book
E.	Cash book	Rejected ordinary shares account

20. Going Concern Concept assumes that an established business entity will operate in perpetuity. This perpetuity concept is …………… assumption.

A) Duality
B) Entity
C) Going concern
D) Money measurement
E) Periodicity

21. The entries for payment of joint venture expenses in case of memorandum joint venture methods is

	DR	**CR**
A.	Goods account	Cash account
B.	Memorandum Joint Venture account	Cash account
C.	Joint Venture account	Cash account
D.	Co-venturer's account	Cash
E.	Joint venture account	Co-venturer's account

22. Which of the following would **NOT** be found in a manufacturing account?

A. Royalties
B. Purchases of raw materials
C. Depreciation of plant and machinery
D. Return inwards
E. Carriage inwards

23. **Use the following information to answer the question below**

Net assets on January 1, 2019	GMD4,250,000
Net assets at December 31, 2019	GMD5,914,583
Drawings for the year ended December 31, 2019	GMD3,152,084

The profit for the period is

A. GMD1,097,916
B. GMD1,487,501
C. GMD4,816,667
D. GMD7,012,499
E. GMD9,066,667

24. Which of the following would be treated as a cash outflow?

A. Bonus issue of shares
B. Decrease in receivables
C. increase in payables
D. Increase in inventory
E. Dividend received

25. In a value-added statement, which of the following is **NOT** distribution of value added

    A. Finance cost
    B. Hire of plant
    C. Interest
    D. Company income tax
    E. Depreciation

Use the following information to answer questions 26 and 27

Boluwatife sold a tricycle to Adeola on hire purchase under the following terms. Initial Deposit ₦50,000, installment of ₦45,000 on monthly basis for a period of ten months. The cash price for the tricycle is ₦400,000

26. The hire purchase price is

    A. ₦575,000
    B. ₦550,000
    C. ₦500,000
    D. ₦450,000
    E. ₦400,000

27. The monthly interest payable is

    A. ₦10,000
    B. ₦9,000
    C. ₦7,500
    D. ₦6,500
    E. ₦5,000

28. Which of the following statement is **TRUE**?

    I. Foreseeable losses should be written off immediately in the period even if the contract has not commenced
    II. All anticipated profits should be recognised immediately in the contract account
    III. All cash advances received in respect of contracts should be recognised immediately
    A. I and II
    B. I and III
    C. I, II and III
    D. II and III
    E. III

29. In a royalty agreement, the following accounts are normally used to record transactions in the books to original landlord and sub-tenant, **EXCEPT**

    A. Royalty payable account
    B. Landlord account
    C. Short working recoverable account
    D. Memorandum account
    E. Royalties receivable account

30. The cost of goods sold, given the sales figure as GH 9,000,000 with a mark-up of 25% is

    A. GH 11,250,000
    B. GH 9,000,000
    C. GH 7,200,000
    D. GH 6,750,000
    E. GH 2,250,000

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. The net amount which the entity expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal is..........................

2. The opening capital of a not-for-profit making organisation is called ....

3. A legal document drawn up to regulate a partnership business is called ....

Use the following information to answer questions 4 and 5

A company's bank statement shows ₦715,000 direct debit and ₦353,000 investment income that are not recorded in the company's cash book. The bank statement did not show a customer's cheque of ₦875,000 entered in the cash book on the last day of the accounting period.

Assuming the cash book shows a credit balance of ₦610,000

4. The balance that appeared in the bank statement is.................

5. The bank balance figure that should be reported in the final accounts is ....

6   The costing method not allowed by IAS 2 on Inventory is ....

7. State **TWO** items in the statement of financial position which are potentially affected by construction contracts.

8. State the formulae for accounts receivables collection period (in days).

9. An accounting adjustments made before year end to improve the appearance of the financial statements is called.......................................

10. State the formula for acid test ratio.

11. The IFRS term for shareholder's fund is ....

12. Dividends payable on preference shares are reported in statement of .... and statement of financial position as current liability

13. Dividends paid on ordinary shares are reported in statements of ....and statements of cash flow.
    Use the following information to answer question 14 and 15

    Adamu, Bala, Gambo are partners, sharing profit or losses in ratio of 2:3:4. The Capital accounts balances after the partnership was dissolved and all accounts closed were Adamu, L$8 million CR: Bala L$12 million CR and Gambo L$16 million DR.

14. What will be Bala's contribution to the deficiency of Gambo assuming Gambo is insolvent?

15. What will be the difference in your answer if Gambo was not insolvent?

16. Shares issued to existing shareholders at a price lower than the market price is called..............

17. In the statement of financial position, the following assets Goodwill, Patent and Trademarks are called ....

18. If the royalties receivable exceeds the minimum royalties and a credit balance exist on the unexpired shortworking allowable account, show the necessary accounting entries required to record shortworkings recoupable within the time limit.

19. X and Y are in partnership with the agreement that Y is entitled to salary of ₦600,000 per annum together with 5% commission on net profit after charging salary and commission, but before interest on capital. The net profit of the partnership for the year is ₦6,050,000. Calculate the commission due to Y for the year. Provide your answer to the nearest naira.

20. State **TWO** basic methods of invoicing goods to the branches.

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

QUESTION 1

The following balances were extracted from the books of Dariye, a sole trader on December 31, 2019

	₦
Capital at January 1, 2019	12,500,000
Receivables	4,715,000
Cash in hand	241,400
Payables	3,442,400
Furniture and fittings	4,220,000
Inventory at January 1, 2019	1,846,000
Turnover	49,100,000
Purchases	38,500,000
Motor vehicle at cost	4,500,000
Motor vehicle expenses	2,750,000
Rent	5,620,000
Drawings	2,650,000

The following information as at December 31, is also available

(i)   ₦250,000 is owing for motor vehicle expenses
(ii)   ₦120,000 has been prepaid for rent
(iii) Inventory at the close of business was valued at ₦1,500,000
(iv)   Provision of ₦2,500,000 is to be made for audit fee
(v)   Provision is to be made for unrecoverable debts at 1% of total receivables at January 1
(vi)   Depreciation is to be provided as follows:

   Motor vehicle: 20% on cost
   Furniture and fittings: 10% on cost

You are required to

Prepare the business opening trial balance, make the necessary adjustments by journal and the final trial balance using extended trial balance.

(Total 12¹/₂ Marks)

QUESTION 2

Lockdown Limited is involved in the manufacture of 'Personal Protective Equipment (PPE) used by health workers and its financial statement are as follows:

Statement of Financial Position

	2019	2018
Non-current Assets	GH¢'000	GH¢'000
Property plant & equipment	9,150	7,305
Total non-current assets	9,150	7,305
Current Assets		
Inventories	1,310	1,445
Trade receivable	805	730
Cash and cash equivalent	490	405
	2,605	2,580
Total Assets	**11,755**	**9,885**

Equity and Liabilities

Equity

Share capital	1,500	1,000
Share premium	250	100
Retained earnings	7,255	6,385
Revaluation surplus	370	600
	9,375	8,085

Non-current Liabilities

Loan Notes	1,400	1,000

Current Liabilities

Trade payables	740	580
Bank overdraft	50	90
Current tax payable	190	130
	980	800
Total equity and liabilities	11,755	9,885

Lockdown Limited Statement of Profit or Loss and Other Comprehensive Income for the year ended 31 December 2019

	GH¢'000
Revenue	21,500
Cost of sales	(18,000)
Gross profit	**3,500**
Distribution costs	(880)
Admin. Expenses	(620)
Finance costs	(210)

Profit before taxation	1,790
Income tax expense	(230)
Profit for the year	1,560
Other comprehensive income:	
Loss on property revaluation	(230)
Total comprehensive income	**1,330**

Additional Information

(i) Property plant and equipment (PPE) with carrying amount of GH 1,600,000 was sold for GH 1,400,000. This asset had originally cost GH 2,250,000.

(ii) Depreciation of property plant & equipment during the year amounted to GH 1,780,000.

(iii) Dividend paid during the year amounted to GH 690,000 and are reported in statement of changes in equity.

Required

Prepare statement of cash flows of Lockdown Limited for the year ended 31 December, 2019 using indirect method.
(Total 12$^1/_2$ Marks)

QUESTION 3

The information extracted from the books of Gold Cast Enterprise Limited as at 31 December, 2019 were:

	₦'000
Total Trade Payables Account Balance	219,465
Trade Payables Account Balance	240,595
Total Trade Receivables Account Balance	94,025
Trade Receivables Account Balance	81,480

Examination of the accounting records shows that:

(i) The Sales Day Book (SDB) had been overcast by ₦2,000 on one occasion and ₦1,000 on another.

(ii)	The Purchases Day Book (PDB) was under cast by ₦15,000 on one occasion and overcast by ₦9,000 on another.
(iii)	Discounts Allowed of ₦200 posted to the Sales Ledger was omitted from the Cash Book (CB).
(iv)	Discount received totaling ₦27,145 was posted to the Total Account as ₦22,645.
(v)	A balance of ₦1,760 was omitted from the list of Trade Receivables.
(vi)	The credit side of Trade Receivable Account was overcast by ₦1,000.
(vii)	Bad Debts of ₦2,440 had been written off in the Sales Ledger, but no entry made in the General Ledger.
(viii)	A balance of ₦9,405 was omitted from the list of Trade Payables.
(ix)	An account of ₦3,465 in the Trade Payables Ledger set off against a contra account in the Sales Ledger, but not recorded in the General Ledger.
(x)	Discounts Allowed of ₦400 was entered in the Cash Book, but not posted to the Customer's Account.
(xi)	An item of ₦1,860 in the Sales Day Book was posted as ₦780 in the Customer's Account
(xii)	Pro-forma invoice on goods worth ₦32,500 posted in the Trade Payable Ledger, but the goods has not be supplied.

You are required to

Show the adjustment necessary in the Total Trade Payables and Trade Receivables balances in the General and subsidiary ledgers.

(Total 12½ Marks)

QUESTION 4

Write short notes on each of the following financial ratios, give **TWO** examples of each and state the formula to calculate each example.

(a)	Profitability Ratios	(2½ Marks)
(b)	Liquidity Ratios	(2½ Marks)
(c)	Leverage Ratios	(2½ Marks)
(d)	Activity Ratios	(2½ Marks)
(e)	Investibility Ratios	(2½ Marks)
		(Total 12½ Marks)

QUESTION 5

The following balances were extracted from the book of accounts of Jamie Limited for the year ended 31 March, 2020 with comparative figures for 2019

	31 March, 2020	31 March, 2019
	GMD'000	GMD'000
Property, plant and equipment	23,750	23,594
Account receivables	1,870	1,769
Account payables	1,530	1,448
10% Loan notes	11,200	11,080
Ordinary shares of 0.50 each	13,200	13,200
Revenue	35,124	34,604
Material consumed	12,934	12,452
Wages	2,607	2,598
Depreciation for the year	1,115	1,114
Fuel consumed	1,290	1,242
Hire of equipment	141	138
Salaries	4,203	4,198
Auditors remuneration	820	580
Income tax expense	1,420	1,393
Dividend per share	GMD0.08	GMD0.10

Required

a. State the stakeholders of the value -added statement   (2 Marks)

b. Prepare the value-added statement of Jamie Limited for the year ended 31 March, 2020.   (10½ Marks)
(Total 12½ Marks)

QUESTION 6

a. Explain the following types of construction contracts

   i. Fixed sum contract

   ii. Variable price contract   (4 Marks)

b. Pandemic Limited was involved in a major construction projects during the year ended 30 September 2019. The company enters into three separate construction contracts each with a fixed contract price of ₦10million.

The following information relates to these contracts as at 30 September, 2019.

	Contracts		
	X	**Y**	**Z**
	₦'000	**₦'000**	**₦'000**
Payment on account (including amount receivable)	5,400	4,750	4,000
Cost incurred to date	5,000	5,500	3,200
Estimated cost to complete the contract	3,000	5,500	5,800
Estimated percentage of work completed	60%	50%	35%

Required

(i) Prepare extracts of statement of profit or loss for each contracts for the year ended 30 September, 2019.   (4½ Marks)

(ii) Prepare extract of statement of financial position for each contracts as at 30 September 2019.   (4 Marks)
(Total 12½ Marks)

SECTION A: PART 1   MULTIPLE-CHOICE SOLUTION

1. E
2. B
3. A
4. D
5. C
6. D
7. D
8. A
9. B
10. C
11. A
12. D
13. C
14. C
15. E
16. D
17. B
18. A
19. C
20. E
21. B
22. D

23. C

24. D

25. B

26. C

27. A

28. B

29. D

30. C

Workings

Q4 and 5   Peter and Paul Partnership

	Peter	Paul	Paulina		Peter	Paul	Paulina
	N'000	N'000	N'000		N'000	N'000	N'000
Goodwill	1,200	2,400	400	Bal	4,500	-	-
				Cash	-	-	1,200
Bal	6,300	2,100	800		3,000	4,500	-
	7,500	4,500	1,200		7,500	4,500	1,200,

9.   [1,051,000 + 100,000 – N733,000] = GH 418,000

10.   [C/R = $\frac{600}{300}$ = 2:1 A/T = $\frac{400}{300}$ 1.33:1]

23.   Closing net asset = opening net assets +profit-drawings
       Profit = 5,914,583+3,152,084-4,250,000 =₦4,816,667

EXAMINER'S COMMENTS

The questions set under this section of the paper cover the syllabus. All the candidates attempted the questions and their performance was fair. Candidates' major pitfall was their poor understanding of some of the questions.
Candidates are advised to prepare well for the future Institute's examinations.

SECTION A: SHORT ANSWER SOLUTIONS

1.   Residual value, Scraps or salvage value

2.   Accumulated fund

3.   Partnership Deed or Partnership Agreement

4.   ₦1,847,000 dr or Overdraft

5.   ₦972,000 cr

6.   LIFO

7.   Inventories, receivables, payables

8. $\dfrac{\text{Receivables} \times 365}{\text{Credit Sales} \quad 1}$

9.   Window dressing

10. $\dfrac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$

11.   Equity

12.   Profit or loss

13.   Changes in equity

14.   N9.6 million   = (12m/20m   x 16m) Rule in Garner v Murray.

15.   Gambo's deficit would be settled from the surplus of his private estate.

16.   Rights issues

17.   Intangible Assets

18. Dr. Short workings Allowable Account; Cr. Landlord Account

19. ₦259,523

20. i. Cost price
     ii. Cost plus mark up

Workings

Questions 4 and 5

Balance as per cash book		(610,000)
Items in bank statement not in cash book		
Direct debit	(715,000)	
Investment income	353,000	(362,000)
Correct balance in the cash book		**(972,000)**
Customer cheque already posted in cash book		(875,000)
		1,847,000
Amount to be in the bank statement		(1,847,000)

Q. 19   ₦6,050,000 − (₦600,000 + 5% of x) = x

₦5,450,000 + 0.05 x = x

₦ 5, 450,000 = 1.05 x

$X = \dfrac{₦5,450,000}{1.05}$

x = (Net profit after changing salary and commission)

= 5,190,476

Commission = ₦5,190,476 x 5%

= ₦259, 524

EXAMINER'S COMMENTS

The questions set under this section of this paper cover substantially all parts of the syllabus. All the candidates attempted the questions and their performance above average.
Candidates' major pitfall was their poor preparation for the examination. Candidates are advised to prepare adequately for the future examinations.

SECTION B:

SOLUTION 1

	OPENING TRIAL BAL		ADJUSTMENTS		FINAL TRIAL BALANCE	
	DR	CR	DR	CR	DR	CR
Capital at Jan 1		12,500,000				12,500,000
Receivables	4,715,000		120,000	47,150	4,787,850	
Cash in hand	241,400				241,400	
Payables		3,442,400		250,000		5,192,400
				1,500,000		
Fixtures & fittings	4,220,000				4,220,000	
Inventory at Jan 1	1,846,000				1,846,000	
Turnover		49,100,000				49,100,000
Purchases	38,500,000				38,500,000	
Motor vehicle at cost	4,500,000				4,500,000	
Motor expenses	2,750,000		250,000		3,000,000	
Rent	5,620,000			120,000	5,500,000	
Drawings	2,650,000				2,650,000	
Prov for depr – Mv			900,000		900,000	
Acc. Depr – Mv				900,000		900,000

Prov for depr – F&F			422,000		422,000	
Acc. Depr – F & F				422,000		422,000
Audit fee			2,500,000		1,500,000	
Accrued audit fee				2,500,000		1,500,000
Prov for bad debts			47,150		47,150	
Inventory Dec 31			1,500,000		1,500,000	
	65,042,400	65,042,400	5,739,150	5,739,150	69,614,400	69,614,400

EXAMINER'S COMMENTS

The question tests candidates' knowledge in the preparation of opening and extended closing trial balance using journal entries.
About 95% of the candidates attempted the question and their performance was well above average.

Candidates'' major pitfall was their poor knowledge in the preparation of journals and Extended trial balance.
Candidates are advised to prepare very well for the Institute's future examination.

SOLUTION 2

<div align="center">

Lockdown Limited

Statement of Cash flows for the year ended 31 December, 2019

</div>

Operating activities	GH¢'000	GH¢'000
Profit Before Tax		1,790
Adjustment for non-cash item		
Finance cost	210	
Depreciation	1,780	
Loss on disposal of PPE (1,400 - 1,600)	200	2,190
Cashflow from operating activities		3,980
Movement of changes in working capital		
Decrease in inventories	135	
Increase in trade receivable	(75)	
Increase in trade payable	160	220
		4,200

Finance cost paid		(210)
Taxation Paid (130 + 230 - 190)		(170)
Net cash flow from operating activities		3,820
<u>Investing activities</u>		
Purchase of PPE by cash (Wk 1)	(5455)	
Proceeds from deposit of PPE (wk2)	1,400	
Net cash flow from investing activities		(4,055)
<u>Financing Activities</u>		
Issues of shares (wk 3)	650	
Issues of loan notes	400	
Dividend paid	(690)	
Net Cash flow from financing activities		360
Increase in cash and cash equivalents for the year		125
Cash and cash equivalents b/f		315
Cash and cash equivalents c/d		440

Analysis of cash and cash equivalents

	2019	2018
	GH¢'000	GH¢'000
Cash and cash equivalents	490	405
Bank overdraft	(50)	(90)
	440	315

<center>Working Notes</center>

WK 1 Determination of Purchase of PPE by Cash	GH¢'000	GH¢'000
Balance as per 2018		7,305
Depreciation for the year	(1,780)	
Disposal during the year	(1,600)	
Loss on revaluation	(230)	(3,610)
Expected Closing Balance		3,695
Actual Closing Balance		9,150
Addition during the year		5,455

Wk 2   **Loss on sale of PPE**

Cost	2,250
Less: Accumulated depreciation	650
Carrying amount	1,600
Less: Sales proceed	1,400
	200

Wk 3   **Share Capital**

	N'000		N'000
Additional share capital	1500	Share capital	1,000
Share premium	250	Share premium	100
		Proceed of share capital	650
	1,750		1,750

EXAMINER'S COMMENTS

The question tests candidates' ability to prepare cash flow statement from a comparative financial position and current statement of profit or loss and other comprehensive income statement.
About 70% of candidates attempted the question and their performance was below average.

Candidates' major pitfall was their poor understanding of the question's requirements. Candidates' are advised to practice with the Institute past questions before sitting for the future examination.

SOLUTION 3

Gold Cast Enterprises Limited

Total Trade Payables Account

	N'000		N'000
Discount Received Undercast	4,500	Balance b/f	219,465
Set Off	3,465	Purchases Daybook Undercast	15,000
Purchases Daybook Overcast	9,000		
Balance c/d	217,500		_____
	234,465		234,465
		Balance b/d	217,500

Trade Payables Account

	N'000		N'000
Pro-forma Invoice	32,500	Balance b/f	240,595
Balance c/d	217,500	Payable balance omitted	9,405
	250,000		250,000
		Balance b/d	217,500

Total Trade Receivables Account

	N'000		N'000
Balance b/f	94,025	Sales Daybook Overcast	3,000
		Discount allowed omitted	200
		Bad debt written off	2,440
		Set Off	3,465
	_____	Balance c/d	84,920
	94,025		94,025
Balance b/d	84,920		

Trade Receivables Account

	N'000		N'000
Balance b/f	81,480	Discount allowed	400
Receivable balance omitted	1,760		
Credit Sales Undercast	1,080		
Credit side overcast	1,000	Balance c/d	84,920
	85,320		85,320
Balance b/d	84,920		

EXAMINER'S COMMENTS

This question tests candidates' knowledge on the preparation of both Trade Receivable and payables in the General and subsidiary ledger with adjustments.
About 50% candidates attempted the question and their performance was fair.

Candidates' major pitfall was their poor understanding of the questions requirement and poor preparation for the examination.
Candidates are advised to prepare adequately well before writing future examinations.

SOLUTION 4

1. <u>Profitability Ratio;</u> These ratios provide an overall evaluation of the performance of the company and its management. This is because the main reason for the existence of the company is to generate returns on owner's investment. Hence, the main questions a shareholder is likely to ask are; is the company making profit? Is the level of profit satisfactory in terms of resources invested? Etc.

I). ROCE – Returns on Capital Employed

$$\frac{\text{Net profit on Ordinary activities before interest \& Tax}}{\text{Capital Employed}} \times 100$$

Where Capital Employed = Shareholders funds plus long term liabilities

II) Profit Margin;

$$\frac{\text{Net Operating Profit before interest \& Taxation}}{\text{Sales}} \times 100$$

III) Assets Turnover;

$$\frac{\text{Sales}}{\text{Capital Employed}}$$

IV) Return on Equity ratio

$$\frac{\text{Net Income}}{\text{Shareholders' Equity}}$$

2). <u>LIQUIDITY RATIO</u>

These ratios measure a company's ability to settle its short term indebtedness as and when due. A company should strike a balance between having too much of its assets tied down in highly liquid assets and not being able to meet its obligations.

i) Current ratio;

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The ideal ratio for any company is 2:1.

II)a.   Quick or Acid Test ratio;

$$\frac{\text{Liquid Assets (i.e. Current assets less inventory \& prepayment)}}{\text{Current Liabilities.}}$$

The ideal liquidity ratio is 1:1

II)b.   Cash ratio;

$$\frac{\text{Cash and Cash equivalents}}{\text{Current Liabilities}}$$

III)   Operating cash flow ratio;

Measures the number of times a company can pay off current liabilities with the cash generated in a given period.

$$\frac{\text{Operating Cash Flow}}{\text{Current Liabilities}}$$

3) <u>LEVERAGE RATIOS</u>.

These ratios are used to measure the long-term solvency and stability of a company. It measures the amount of capital that comes from debt. It is used to evaluate a company's debt Level.

I)   Gearing; $\frac{\text{Fixed Interest loan + Preference share capital}}{\text{Equity.}}$

II)   Debt to Equity ratio;

$$\frac{\text{Total liabilities}}{\text{Shareholders Equity.}}$$

III)   Interest Coverage ratio; (show how easily a company can pay its interest expenses)

a) Fixed Interest Coverage ratio;

$$\frac{\text{Operating Income}}{\text{Interest Expenses}}$$

b) Debt Service Coverage ratio;

$$\frac{\text{Operating Income}}{\text{Total Debt Service}}$$

IV) Proprietary ratio;

$$\frac{\text{Shareholders Fund}}{\text{Total Assets (Tangible)}}.$$

4) Activity / Efficiency Ratio;

These ratios measures the efficiency with which the assets of a company are utilized for the purposes of generating income and the ability of the management to keep expenses within predetermined level.

I) Inventory Turnover;

$$\frac{\text{Cost of Sales}}{\text{Average Inventory}}$$

II) Receivables Turnover;

$$\frac{\text{Credit sales}}{\text{Receivables}}$$

III) Average Collection Period;

$$\frac{\text{Trade Receivables}}{\text{Credit Sales}} \times 12 \text{ months}.$$

IV) Payables Turn over

$$\frac{\text{Credit Purchases}}{\text{Payables}}$$

V) Payables payment Period;

$$\frac{\text{Trade payables}}{\text{Credit Purchase}} \times 12 \text{ months}.$$

VI) Non- Current Asset Turnover

$$\frac{\text{Sales}}{\text{Non-current Assets}}$$

VII) Total Assets Turnover;

$$\frac{\text{Sales}}{\text{Total assets}}$$

VIII) Expenses to sales %;

$$\frac{\text{Individual Expenses}}{\text{Sales}} \times 100$$

5.)   INVESTIBILITY RATIOS

These ratios measures a company's investment potentials. It is also used to measure a company's growth.

I) Net book value per Ordinary share;

$$\frac{\text{Net book value of ordinary shares}}{\text{No of ordinary shares}}$$

II) Earnings per share;

$$\frac{\text{Net profit after tax \& preference shares Dividend but before extraordinary item}}{\text{No of shares}}$$

III) Dividend per share;

$$\frac{\text{Total Dividend}}{\text{No of Ordinary shares}}$$

IV) Price /earnings ratio;

$$\frac{\text{Market Price per ordinary shares}}{\text{Earnings per share}}$$

V) Earnings Yield;

$$\frac{\text{Earnings per share.}}{\text{Market price per share.}}$$

VI) Dividend Yield;

$$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

VII) Payment Ratio;

<div align="center">

Dividend per share.
Earnings per share.

</div>

EXAMINER'S COMMENTS

This question tests candidates knowledge on the meaning of financial ratios terms and at the same time give examples.
About 90% of the candidates attempted the question. The question tested candidate knowledge and understanding of financial ratios and analysis. Most of the candidates could not explain each of the financial ratios. However, the students did well with relevant examples and formulas.

Candidates are advised to read relevant texts when preparing for future Institute examination.

SOLUTION 5

a).   Stakeholders of value added statement

    I.   Employees
    II.   Government
    III.   Shareholders
    IV.   Lenders
    V.   Directors

5b.   Value Added Statement

Revenue	35,124	
Less: Bought in materials (Note)	15,185	
Value Added	19,939	100%

Applied as follows:

To pay Employees:

Salaries	4203		
Wages	2067	6810	34.16

To remuneration:

Income tax		1420	7.12

To providers of capital:

Dividend	2112		
Income loan	1120	3233	16.21

For growth & expansion:

Depreciation	1115		
Retained profit	7362	8477	42.51
			100

Note: Bought in materials

Materials consumed	12934
Fuel consumed	1290
Hire of equipment	141
Auditors remuneration	820
	15,185

EXAMINER'S COMMENTS

This question tests candidates knowledge of value –added statement. Part (a) of the question tests ability to state the stakeholders of the value-added statement, while part (b) of the question tests the preparation of value-added statement.

About 85% of the candidates attempted the question and their performance was below average as they scored about 25% of the marks allocated. It shows that many of the candidates do not have a full understanding of what it takes to construct a value added statement which is the requirement of question 5b. The requirement of question 5a is to state the stakeholders of value added statement, but the students end up providing examples of stakeholders of financial statement in general and not examples of value added statement in specific terms.

Candidates' major pitfall was their poor understanding of the question's requirements. Candidates are advised to consult relevant texts when preparing for the examination in order to be fully prepared for the examination.

SOLUTION 6

(a)   Explanation of Type of construction contract:

   (i)   Fixed Sum Contract

   Under this type of contract the contractor agreed to a fixed contract price or sum, in some cases subject to cost escalation clauses. For fixed sum contract to be used, the following conditions must be obtainable:

   a. Total contract revenue must be reliably estimated.

   b. Cost of completion can be reliably estimated.

   c. Percentage of the contract performance completed at the reporting date can be reliably estimated.

   (ii)   Variable Price Contract

   This type of contract contains one or more clauses regarding:

   a. Price variation that allows adjustment to the base price.

   b. Work variation for an additional work order from the employer.

   c. Prologation that takes care of additional costs resulting from delays not caused by the contractor.

(b)

PANDEMIC LIMITED

STATEMENT OF PROFIT OR LOSS (EXTRACT) FOR EACH CONTRACT

FOR THE YEAR ENDED 30 SEPTEMBER, 2019

	Notes	X	Y	Z	Total
		N'000	N'000	N'000	N'000
Revenue	(w1)	6,000	5,000	3,500	14,500
Expenses	(w2)	(4,800)	(5,500)	(3,150)	(13,450)
Expected loss	(w2)	--	(500)	-	(500)
Gross profit		1,200	(1,000)	350	550

Extract of Statement of Financial Position As At 30 Sept. 2019

	Notes	X	Y	Z	Total
		N'000	N'000	N'000	N'000
Gross amount due from contractor	(w3)	800	--	--	800
Gross amount due to customers	(w4)	--	(250)	(450)	(700)
Trade receivable	(w5)	--	--	--	--

Working Notes:

(w1) Revenue

	X	Y	Z
	N'000	N'000	N'000
Revenue (N10m x 60%)	6,000	--	--
Revenue (N10m x 50%)	--	5,000	--
Revenue (N10m x 35%)	--	--	3,500
	6,000	5,000	3,500

(w2) Expenses

	X	Y	Z
	N'000	N'000	N'000
Expenses(60% x (5,000 + 3,000)	4,800	--	--
Expenses (all cost to date)	--	5,500	--
Expected loss (5,000 – 5,500)	--	500	--
Expected expense [9,000 x 35%]	--	--	3,150
	4,800	6,000	3,150

(w3) Amount due to/from Customers

	X	Y	Z
	N'000	N'000	N'000
Contract cost incurred	5,000	5,500	3,200

Recongnised profit or loss	1,200	(1,000)	350
	6,200	4,500	3,550
Less: Progress billing to date	(5,400)	(4,750)	(4,000)
	800	(250)	(450)

EXAMINER'S COMMENTS

This question tests candidates knowledge on contract account, part (a) of the question tests their knowledge on contract terms, while the part (b) tests their ability to prepare statement of profit or loss for the three (3) contracts and they were expected to prepare the extract of the statement of financial position as at company's year end.
About 85% of the candidates attempted the question and their performance was below average.

Candidates' major pitfalls were poor understanding of the area tested in the question and poor preparation.
Candidates are advised to prepare adequately well before sitting for the future Institute's examination.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

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

PUBLIC SECTOR ACCOUNTING

PLEASE READ THESE INSTRUCTIONS BEFORE COMMENCEMENT OF PAPER

EXAMINATION INSTRUCTIONS

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

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

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

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

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

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

WEDNESDAY, 31 MARCH 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 – MARCH 2021

PUBLIC SECTOR ACCOUNTING

Time Allowed: 3 hours

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

ATTEMPT ALL QUESTIONS IN THIS SECTION

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

1. Board of Enquiry can only be set up in the Public Sector when
    I.   There is a probability of fraud
    II. Loss is substantial
    III. Possible collution is suspected
    IV. The officer is a professional

    A.   I, II and III
    B.   II, III and IV
    C.   III
    D.   III and IV
    E.   IV

2. In the public sector, ... advance is purposely used in writing off loss of public funds.

    A.   Touring
    B.   Non personal
    C.   Personal
    D.   Motor vehicle
    E.   Salary

3. IPSAS 31 states conditions for recognising an intangible asset whether purchased or self created, **EXCEPT**

    A.   It is probable that future economic benefit attributable to the asset will flow to the entity
    B.   Cost or fair value of assets can be reliably measured
    C.   Additional recognition criteria for internally general intangible asset
    D.   All research cost are charged to expense when incurred
    E.   Must be a movable asset

4. Which of the following is **NOT** a means by which the Minister of Finance controls Government expenditure?

   A. Issuance of Financial Authorities
   B. Issuance of Financial regulations
   C. Issuance of Financial circulators
   D. Issuance of Financial budgetary guidelines
   E. Issuance of operations guidelines for Insurance companies

5. Which of the following does **NOT** include the composition of Revenue in IPSAS Accrual basis of Accounting?

   A. Transfer receipt
   B. Aid and Grants
   C. Federal Government share of Federation Account Allocation Committee (FAAC)
   D. Independent Revenue
   E. Research and Development

6. Proceeds of Pay as you earn of the Armed Forces, Foreign Service officers and residents of the Federal Capital Territory are paid into ……………… account.

   A. Contingency Fund Account
   B. Federation Account
   C. Consolidated Revenue Fund Account
   D. Development Fund Account
   E. Special Fund Account

7. A commodity that is non-rivaled and non-excludable in consumption is referred to as ………………… goods.

   A. Public
   B. Private
   C. Natural
   D. Economic
   E. Giffen

8. GPFS is an acronym for

   A. General Purpose Finance Statements (GPFS)
   B. General Principle Financial Statements (GPFS)
   C. General Principal Financial Statements (GPFS)
   D. General Purpose Financial Statements (GPFS)
   E. General Principle Finance Statements (GPFS)

9. International Public Sector Accounting Standard (IPSAS) 2 relates to ....

   A. Borrowing Costs
   B. Accounting for Investments and Associates
   C. Revenue from exchange transactions
   D. Events after reporting date
   E. Cash flow Statement

10 The responsibilities of the Sub-Accounting Officer include

   I. Maintenance of the recognise Treasury Cashbooks
   II. To charge into his accounts under proper heads and sub-heads, all payments of cash and expenditure commitments immediately such are effected
   III. To check all cash, stamp, paper money and investment records in his care for verification of the balances with cash register and other registers
   IV. To recognise any excess cash discovered apart from the balance in the cash register, as revenue
   V. To approve all financial payment raised by Self-Accounting Unit

   A. I, II, III, and V
   B. I, III, IV and II
   C. I, II, III, and IV
   D. I, IV and III
   E. I, II, and IV

11. Which of the following is **NOT** a feature of a valid online payment or Receipt (e- payment and e-receipt) voucher?

   A. Date of the voucher and voucher number or control number
   B. Classification code (or chart of accounts), that is Head/Subhead
   C. Description of payment, (that is job done or service rendered)
   D. Name and address of payee and amount (in words and figures)
   E. Signature of the paying imprest holder

12. Statement No.2 Assets and Liabilities, comprises of the following, **EXCEPT**

   A. Consolidated Revenue Funds Balance
   B. Pension Accounts with Central Bank Nigeria
   C. Imprest
   D. Advances
   E. Police Reward Funds

13. Which of the following is **NOT** a function of the Fiscal Responsibility Commission?

   A. Monitoring and enforcing the promotion of economic objective
   B. Disseminating standard practices of public expenditure, revenue collection, debt control
   C. Undertaking fiscal and financial studies, analysis and diagnosis
   D. Apportioning and approving annual estimate for public institution
   E. Compelling public officer to disclose information relating to public revenue and expenditure

14. Section 88 of the Nigerian Constitution, 1999 confers power to investigate misappropriation of funds on the

   A. Auditor-General for the Federation
   B. National Assembly
   C. Accountant-General of the Federation
   D. ICPC
   E. EFCC

15. Which of the following is **NOT** a permissive source of income to the local government?

   A. Market taxes
   B. Motor park levies
   C. Donations
   D. Cattle tax
   E. Tenement rates

16. Which of the following is a duty of the Auditor-General for the Federation?

   A. Appropriation Audit to ensure that funds are expended as appropriated
   B. He submits to the Accounting Officer a detailed programme of audit
   C. Maintenance of cash book
   D. Promptly prepares such financial statements as required by law
   E. Maintenance of statement of cash flows

17. Under the Pension Reform Act 2014 as amended for both Public and Private Sector, Pension Schemes are now

   I. Non contributory
   II. Pensionable
   III. Contributory

A. I
B. I & II
C. II
D. II & III
E. III

18. Which of the following officers serves as Secretary to the Funds Management Committee of the Local Government?

A. The Chairman
B. The Council Treasurer
C. The Vice Chairman
D. Secretary to Local Government
E. Head of Personnel Management

19. The Officers heading the ordinary Board of Survey and Enquiry must be on Grade Level.

A. 6 and above
B. 7 and above
C. 8 and above
D. 9 and above
E. 10 and above

20. Which of the following is **NOT** a department in Accountant-General's Office?

A. Cash Supply
B. Federal Pay Office
C. Final Account
D. Ministry of Financial Incorporated (MOFI)
E. Culture

21. The body saddled with the responsibility of supervision, coordination and regulation of Pension Scheme is called

A. National Pension Commission
B. Pension Asset Commission
C. National Fund Commission
D. Pension Fund Commission
E. Pension Fund Corporation

22. Which of the following Tender Board can approve contracts whose values exceed ₦50,000,000?

   A.   Departmental Tenders Board
   B.   Parastatal Tenders Board
   C.   Ministerial Tenders Board
   D.   Police Tenders' Board
   E.   Federal Executive Council (FEC)

23. According to the Armed Forces Act No. 125 of 1967, an Officer who have completed 3 years during the war is counted as .... years.

   A.   3
   B.   4
   C.   5
   D.   6
   E.   7

24. Which of the following is **NOT** an Inventory Valuation Method?

   A.   First – In – First – Out
   B.   Simple Average
   C.   Last – In – First – Out
   D.   Weighted Average
   E.   Specific Identification

25. Auditor General for the federation cannot be removed, **EXCEPT**

   A.   On sanity
   B.   He has served for 20 years
   C.   He joins a political party
   D.   Ill-health
   E.   He attains the age of 50 years.

26. Which of the following officers is required to report on the strength of the internal control system?

   A.   Vote controller
   B.   Auditor-General
   C.   Inspector of internal control system
   D.   Accountant-General
   E.   Internal control system office

27. Which of the following is related to the internal sources of information for the purpose of publishing government accounts?

    A. Accounts from High commission and Embassies overseas
    B. Transcripts from ministries and Departments
    C. Accounts from crown Agents (Nigeria high commissions)
    D. Audited Accounts of Banks
    E. Information generated from World Bank

28. Which of the following is **NOT** a factor that can cause changes in net assets of an entity?

    A. Surplus/deficit during the period
    B. Disclosure of legal form of entity
    C. Significant changes in accounting policies
    D. Correction of prior year errors
    E. Assets revaluation

29. Which of the following are types of computer audit?

    I. Computer Annual Audit
    II. Auditing Round the Computer
    III. Auditing Round the Client Account
    IV. Auditing through the office

    A. I
    B. I and III
    C. I, III and IV
    D. II
    E. II and IV

30. What is the full meaning of IFAC?

    A. International Federation of Accounting Committee
    B. International Financial Accountants Committee
    C. International Federation of Accountants
    D. International Federation of Auditors
    E. International Financial Assistance Committee

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. The Ministerial Tender Board threshold for contracts is between i................ and ii...............

2. A documentary evidence of payment or receipt of money which is available for future accounting and auditing purpose is called..................................

3. The foremost driver of a country's economy is the........,.........................

4. The Independent Corrupt Practices and other related offences Commission Act 2000 stipulates that the chairman of the commission is to hold office for five years, while other members shall hold office for................. years.

5. State the **FOUR** information that are contained in the IPPIS payslip

6. List **FOUR** examples of Fees and Fines under Consolidated Revenue Funds.

7. The ....is an officer who is "accountable" for the receipts and payments of the government financial activities in the Ministry, Extra-Ministerial, Department and Agency (MDA).

8. ....is a document used by the Ministry of Finance to authorise money for spending by government departments and agencies.

9. The Public Procurement Act of 2007 was an enactment of.....................

10. The organisation that is in charge of privatisation programme in Nigeria is........

11. A fiscal and accounting entity in which resources are held, governed by special regulations, separated from others and established for specific purposes in the public sector is known as..........

12. The document with codified set of rules and regulations which provides detailed guidance and instructions on the financial accounting and stores procedures to be followed in the administration of financial affairs and material management of each local government in Nigeria is called.......

13. In Public Sector Accounting, authority to write – off the arrears of revenue is vested in the ....

14. The action of a public officer who does any arbitrary thing which prejudices the right of others is called ....

15. The budget that takes into consideration different levels of output and recognises fixed and variable cost is known as ....

16. A cessation of service after an officer has served for a minimum period of 10 years is called ....

17. Acquisition of physical and permanent assets in the form of equipment, vehicle and buildings is known as ....

18. The appointment of the Auditor-General is subject to .... by the National Assembly.

19. An audit that is carried out to determine whether or not a public sector organisation is acquiring or managing its resources (money, men, and materials) economically, efficiently and effectively is called ....

20. The use of deception to obtain an unjust or illegal financial advantage and /or theft, whether or not accompanied by misstatement of accounting records or the accounts is ....

SECTION B   **ATTEMPT ANY FOUR QUESTIONS**   **(50 Marks)**

QUESTION 1

Financial Regulation 2009 S.S 1001 defines Imprest as all cash advanced to Government officers to meet up with urgent expenditure which is provided for in current budget but which vouchers cannot be presented immediately to a sub Accounting officer for payment.

Required

a. i.   Briefly explain **TWO** types of Imprest   (1 Marks)

    ii. State **FIVE** checks and balances required for keeping an Imprest Account in the Public Sector   (5 Marks)

b. i.   Define Departmental Vote Expenditure Allocation Book (D.V.E.A)
                                                                    (1½ Marks)
    ii. State **FIVE** functions of officer controlling expenditure   (5 Marks)
                                                        (Total 12½ Marks)

QUESTION 2

a.   You are among the Senior Accountant in your office who had attended the training workshops on International Public Sector Accounting Standards (IPSAS), organised by Office of the Accountant-General in your State.

   You are required

   Design a suitable template for the "Monthly IPSAS Accrual Basis Compliant Trial Balance" for the Finance and Accounts Department for your Ministry or Extra-Ministerial Department or Agency.   (3½ Marks)

b.   The following balances were extracted from the books of account in the Ministry of Waterside, for the month of July 2020

	Codes Descriptions	**₦**
0x94	Bonds and Sureties	2,507,000
0x85	Payable	56,500
0x76	Short Term Loans	25,900
0x67	Public Funds	150,000
0x58	Long Term Borrowing	120,000
0x49	Provision for Depreciation- Dams	4,000
0x81	Statutory Allocation	5,247,550
0x72	Grant-in-Aid	10,750

0x63	Debt Forgiveness	8,900
0x45	Tax Revenues	25,450
0x45	Non-Tax Revenues	40,750
0x36	Royalty on Gemstone	5, 750
0x27	Profit on Disposal of Assets	3,550
0x18	Investment Incomes	7,500
0x73	Non-Current Assets	2,950,000
0x64	Amory Stores (Ammunition & Other)	150,000
0x55	Printed Materials	75,000
0x46	Receivable-Personal Advances	120,000
0x37	Internal Accounts Transfer	950,000
0x82	Overhead Cost	550, 000
0x73	Personnel Cost	2,350,000
0x64	Social Benefit	280,000
0x55	Bad Debt Charge	48,750
0x46	Subsidy	724,300
0x37	Depreciation Charge	10,550
0x28	Utility General	5,000

Required

Prepare and present a suitable monthly return in accordance with the "IPSAS Accrual Basis Compliant Trial Balance" for July 2020.   (9 Marks)

NOTE: Ignore the Column for "Analysis of Economic Items Accounting to Sources"   **(Total 12½ Marks)**

QUESTION 3

a.   What are the provisions of the Financial Reporting Council of Nigeria Act 2011 on the appointment and tenure of office of the Chairman and members of the Council?   (7 Marks)

b.   State other functions of the Bureau of Public Enterprises (BPE) apart from commercialisation and privatisation functions.   (3 Marks)

c.   What are the Powers conferred on BPE by the enabling Act?   (2½ Marks)
          (Total 12½ Marks)

QUESTION 4

a.   i.   State what the mnemonic PTAD stands for   (1 Mark)

      ii.   What is the responsibility of PTAD?   (1½ Marks)

b.   What are the roles of PTAD?   (10 Marks)

(Total 12½ Marks)

QUESTION 5

a.   Explain the Concept of "Accounting Officer" in the Financial Rules and Regulations.   (2 Marks)

b.   What are the main responsibilities or duties of an "Accounting Officer"?

(8 Marks)

c.   List **TEN** examples of the concept of "Accounting Officer"   (2½ Marks)

(Total 12½ Marks)

QUESTION 6

ONOARA Republic of FOREVERJOY has been preparing its financial statements using cash basis. But in the year 2014, it took a bold decision to migrate to the International Public Sector Accounting Standards (IPSAS). In compliance with the Technical Sub-Committee, FAAC sets 1st January, 2015 for the commencement of IPSAS Accrual Accounting.

The following information was derived from the Final Accounts Directorate in the Office of the Accountant General as at 31st December, 2019.

(i)   General Revenue Balance on 31st December, 2019 was ₦520,250.

(ii)   Assets and Liabilities as at 31st December, 2019 include:

	₦
Cash and Cash Equivalents	357,950
Investment Property	8,081,000
Receivables	3,500,000
Investments	300,000
Short Term Loans & Debts	554,350
Property, Plant & Equipment	1,008,700
Accumulated Surpluses/ (Deficits)	11,840,350
Inventories	255,750
Reserves	1,108,700

You are required to

a.   Prepare the Statement of Financial Position as at 31st December, 2020 using IPSAS Format.   (8 Marks)

b.   SATOSTB is a government entity that is IPSAS compliant. Revenues are recognised when the outcome of a transaction involving the rendering of services can be estimated reliably. From the information provided below;

The Entity sells products worth ₦225,000 to a customer on 1st January, 2020. The customer paid ₦15,000 on receipt of the product, while the balance was paid in February, 2020.

You are required

To record the Accounting entries of the transactions.   (4½ Marks)

(Total 12½ Marks)

SECTION A: PART I

MULTIPLE CHOICE SOLUTIONS

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

27. B

28. B

29. D

30. C

EXAMINER'S COMMENTS

This consists of 30 Compulsory Questions that covers the entire parts of the syllabus. All candidates attempted this section and performance was high as more than 80% scoring above 50% of total marks obtainable.

SECTION A: PART II   SHORT ANSWER SOLUTIONS

1. ₦ 500,000 – ₦ 5,000,000

2. Voucher

3. Public Sector – (bonus mark)

4. 4 years

5. The FOUR (4) information in the content of an IPPIS payslip are:
    i.   Earning:
          a. Salary
          b. Acting Allowance
          c. Salary Arrears
          d. Overtime Allowance

    ii.   Statutory Deductions:

          a. Tax Due (PAYE)
          b. NHIS (National Health Insurance Scheme)
          c. NHF (National Housing Funds)
          d. Contribution Pension Scheme and Pension PIN

    iii. Non-Statutory Deductions:
          a. Union Due
          b. Cooperative, Thrift and Loan Due
          c. Rent Allowances
          d. Furniture Loan (Advance)

iv.   Net Pay
        v.   Employee Information:
                        a. Name
                        b. Rank (Position)
                        c. Grade Level
                        d. IPPIS Number
                        e. Mobile Number and
                        f. ID Card (Service) No.

        vi.   Month and Year concerned
        vii.   Bank Information:
                        a. Account Number and
                        b. Bank Branch

        viii.   Name of the Entity or Organization

6.   The FOUR (4) examples of Fees and Fines under Consolidated Revenue Funds
        are: i.   Business Name and Company Registration Fees
                    ii.   Court Fees and Fines
                    iii.   Postage, Telegraphs and Telephone Fees
                    iv.   Passport and Visa Fees
                    v   Trade Marks and Patent
                    vi.   Citizenship, Naturalization and Aliens Fees

7.   Accounting Officer or Permanent Secretary or Director- General or Comptroller-
        General or Inspector-General or Post-Master-General or Any equivalent

8.   Warrant

9.   The National Assembly

10.   Bureau of Public Enterprises

11.   A Fund

12.   Financial Memoranda

13.   Minister of Finance

14.   Abuse of Power

15.   Flexible Budget

16.   Retirement

17.   Capital Expenditure

18. Ratification

19. Value-for-money Audit

20. Fraud

EXAMINER'S COMMENTS

This consists of 20 short answer questions that covers the entire parts of the syllabus. All the candidates attempted this section. The performance was fair as about 60% of them scoring above 50% of total marks allocated.

SOLUTION 1

A. i.) Two types of Imprest

       a. Standing Imprest: This is a general imprest which is in use from the beginning of a fiscal year to the end to the end of that year. It is reimbursed as and when required. All standing imprest balances should be retired on or before 31st December of the year.

       b. Special Imprest: This is an imprest that is generated for special purpose when the need arises. Special imprest must be terminated and all balances retired immediately the purpose for which it is set up is achieved.

A. ii.) Checks and balances for keeping an Imprest Account

       a. The imprest officer should be an officer from grade level 04 and above.
       b. The officer should be an officer of proven integrity.
       c. Imprest money should not be used for any other purpose.
       d. The officer keeping imprest cashbook should balance the book regularly.
       e. The imprest cashbook should be checked regularly for any anomaly or sharp practices by the Sub Accounting officer.
       f. Any balance of imprest must be retired at the end of the Fiscal year.
       g. Any imprest from N50,000 and above should be banked by the imprest holder in an account to be opened in his official status.
       h. There should be no lending to employees from the imprest money.

i. Payment vouchers should be raised for all disbursement from the imprest money.

j. All expenditure from the imprest should be properly authorised.

B. i.) Departmental Vote Expenditure Allocation Book (D.V.E A)

It is simply referred to as vote book. It is a record kept by all officers entrusted with the responsibility of having total and express control of the expenditure vote in his ministry or Department. Vote book records all expenditure including Liabilities incurred as regards vote allocated to a particular ministry or Department. It is controlled by an Accounting Officer.

B. ii.) Functions of Officer Controlling Expenditure.

a. To ensure that the vote book is properly maintained by entering all Payments accurately.

b. To forward on monthly basis returns to the vote issuing ministry or Department.

c. To make investigations, reports and take any other action as he deems fit where he discovers any irregularities in a payment voucher.

d. To ensure that all expenditures are justified.

e. He must ensure that votes are always available throughout the Fiscal year by spreading them evenly.

f. He must ensure that the votes are applied for the purpose for which they are provided.

g. To demand additional provision of votes where he feels that incurred liabilities will be more than the votes obtained.

EXAMINER'S COMMENTS

The question tested the candidates understanding of Imprest Account. It also tested their knowledge of Vote Book and on functions of the Officer Controlling Expenditure. About 85% of the candidates attempted this question. The performance was fair as about 55% scoring above 50% of the mark obtainable. The major pitfall is the inability of some candidates to identify the types of Imprest and the DVEA Book.

SOLUTION 2

a.   A suitable template is as follows:

Ministry of Waterside
Monthly IPSAS Accrual Basis Compliant Trial Balance *
For the Month ended 31ˢᵗ July, 2020

Economic Codes *	Descriptions *	Debit *(N)	Credit * (N)	Analysis of Economic Items According to Sources *			
				Budget	Service Wide Vote	Capital Supplementation	Aid & Grants
				0201	0202	0203	0204
01	Revenues *		xx	Xx			
02	Expenditures *	xx		Xx			
03	Assets *	xx		Xx			
04	Liabilities *		xx	Xx			
	Total *	xx	xx				

	Names	Position	Signature
1. Prepared by *			
2. Checked by *			
3. Approved by *			

b.   Ministry of Waterside,
      Monthly IPSAS Accrual Basis Compliant Trial Balance *
      For the month of July 31st, 2019

Code *	Descriptions *	Debits *	Credit *
01	**Revenues:**		
0x81	Statutory Allocation		5,247,550 *
0x72.	Grant-in-Aid		10,750 *
0x63.	Debt Forgiveness		8,900 *
0x54	Tax Revenues		25,450 *
0x45	Non-Tax Revenues		40,750 *
0x36	Royalty on Gemstone		5,750 *
0x27	Profit on Disposal of Assets		3,550 *
0x18	Investment Incomes		7,500 *

02	**Expenditures:**		
0x82	Overhead Cost	550, 000 *	
0x73	Personnel Cost	2,350,000 *	
0x64	Social Benefit	280,000 *	
0x55	Bad Debt Charge	48,750 *	
0x46.	Subsidy	724,300 *	
0x37	Depreciation Charge	10,550 *	
0x28.	Utility General	5,000 *	
03	**Assets**		
0x73	Non-Current Assets	2,950,000 *	
0x64	Amory Stores (Ammunition & Other)	150,000 *	
0x55	Printed Materials	75,000 *	
0x46	Receivable-Personal Advances	120,000 *	
0x37.	Internal Accounts Transfer	950,000 *	
04.	**Liabilities**		
0x94	Bonds and Sureties		2,507,000 *
0x85	Payables		56,500 *
0x76	Short Term Loans		25,900 *
0x67	Public Funds		150,000 *
0x58.	Long Term Borrowing		120,000 *
0x49	Provision for Depreciation- Dams	--	4,000 *
	Total as at 31st July, 2019	8,213,600 *	8,213,600 *

	Names	Position	Signature
1. Prepared by *			
2. Checked by *			
3. Approved by *			

EXAMINER'S COMMENTS

This question is divided into two parts, "a" and "b". The 'a' part tested the candidates understanding of template for the "Monthly IPSAS Accrual Basis Compliant Trial Balance". While the "b" part required candidates to prepare a suitable monthly return in accordance with the "IPSAS Accrual Basis Compliant Trial Balance" from the information provided. The question was attempted by about 90% of the candidates and

the performance was above average as over 60% of them scored above 50% of total marks obtainable.

SOLUTION 3

3a. Provisions of the Financial Reporting Council of Nigeria Act 2011 on the appointment and tenure of the Chairman and members of the Council.

Appointment of the Chairman and members of the Financial Reporting Council of Nigeria Act
1. The Chairman shall be appointed by the President, on the recommendation of the Minister
2. The members shall be recommended by their various professionals or statutory bodies to the Minister
3. Minister recommends members for appointment by the President.
4. In appointing the Chairman and the Executive Secretary, due cognizance shall be taken to ensure fair representation of accounting bodies established by Acts of National Assembly.
5. They may be appointed on such terms and conditions as may be specified in their letters of Appointment

Tenure of Office
- The Chairman and other members of the Board shall each hold office for a term of 4 years in the first instance and
- They may be reappointed for a further term of 4 years and no more.

3b Other functions of the Bureau of Public Enterprises Bureau apart from commercialization and privatization functions
The Bureau shall-
1. provide secretarial support to the Council; and
2. Carry out such other duties and responsibilities as may be assigned to it from time to time by the Council.

3c Powers of the Bureau of Public Enterprises (Bureau)
The Bureau shall, subject to the overall supervision of the Council, have power to-
1. Acquire, hold and manage movable and immovable property;
2. Enter into contracts or partnerships with any company, firm or person which in its opinion will facilitate the discharge of its functions;
3. Request for and obtain from any public enterprise statistical and other information including reports, memoranda and audited accounts and other information relevant to its functions under this Act; and

4. Liaise with relevant bodies or institutions locally or overseas for effective performance of its functions under this Act.

EXAMINER'S COMMENTS

The question tested candidates' knowledge on the provisions, appointment, functions and powers of the Financial Reporting Council of Nigeria and the Bureau of Public Enterprises (BPE). This question was not well attempted, about 40% of the candidates attempted the question and less than 30% scoring above 40% of marks allocated. The major pitfall was the inability of the candidate to understand the appointment to FRCN council and other functions and the power of the BPE.

SOLUTION 4

a. (i)   PTAD stands for Pension Transitional Arrangement Directorate.

(ii)   -   PTAD is responsible for the Pension administration of the Defined Benefit Scheme (DBS)

OR

-   (Alternatively) – PTAD is responsible for payment to existing retirees of the Federal Government that retired up to June, 2007 and thus exempted from the Contribution Pensions Scheme.

b.   The Roles of Pension Transitional Arrangement Directorate (PTAD) is to address the numerous pensioners' complaints that bother on issues such as:
(i)   Non – payment of monthly pension
(ii)   Removal of name on Pension Payment Voucher
(iii) Non – payment of harmonized pension arrears
(iv)   Irregular payment of federal pension
(v)   Non – receipt of pension after retirement
(vi)   Short payment of Pension and Gratuity

EXAMINER'S COMMENTS

The question required candidates to state the mnemonic, responsibility and roles of PTAD. Many candidates did not attempt the question. Only about 20% of the candidates attempted with less than 5% of them scoring above 40% of marks allocated.

SOLUTION 5

5   a.   **CONCEPT OF ACCOUNTING OFFICER**
In line with the Financial Regulation (FR 111), the term "**Accounting Officer**" means the *__Permanent Secretary__ of a Ministry or the Head of extra-ministerial office and other arms of government **who is in full control** of, and is *__responsible__ for human, material and *__financial resources__ which are critical inputs in the management of an organization.

5   b.   **FUNCTIONS OF AN ACCOUNTING OFFICER**

i.   To establish and manage an effective, efficiently run and result-oriented Internal Control Department in his Ministry.

ii.   To ensure that proper books of accounts and system as specified by the Minister of Finance are kept.

iii.   To ensure that all revenue accruable to his Ministry are collected and accounted for as and when due.

iv.   To ensure that there is provision for effective security system over all government funds.

v.   To install adequate preventive measures against frauds and misappropriation of funds.

vi.   To ensure that only trustworthy, dedicated and reputable officers are entrusted with government funds.

vii.   To ensure that all payments are backed up with proper authority and that only services and goods provided are paid for.

viii.   To make available all the cash, stamps, bank statements etc in his custody when such is requested for by the Accountant-General of, or Auditor-General for the Federation.

ix.   To ensure that financial statements statutorily required are prepared without delay.

x.   Ensuring personal appearance before the Public Accounts Committee to answer audit queries to ministry/extra-ministerial department or agency.

5   c.   EXAMPLES OF THE CONCEPT OF "ACCOUNTING OFFICER"

	Accounting Officer or Equivalent Post	Applicable Organizations
i.	Permanent Secretary	Ministries
ii	Director- General	Commissions or Corporations or Agencies/Parastatals
iii	Chief Executive Officer	Commissions or Corporations or Agencies/Parastatals
iv	Commandant- General	Para-Military- NSCDC
v	Comptroller-General	Correctional Services, Custom Service, etc
vi	Inspector-General	Police
vii	Post-Master-General	Post Office
viii	Clerk of the National Assembly	National Assembly
ix	Registrar	Judiciary
x	Accountant-General	Finance or OAGF
xi	Corps Marshal	Federal Road Safety Corps
xii	Executive Secretary	Financial Reporting Council of Nigeria (FRCN)
xiii	Vice Chancellor	Universities
xiv	Local Government Chairman	Local Government

EXAMINER'S COMMENTS

The question required candidates to explain concepts, responsibilities and examples of "Accounting Officer" in the Financial Rules and Regulations. About 85% of the candidates attempted this question and about 60% of them scoring 50% of total marks obtainable.

SOLUTION TO QUESTION 6

ONOARA

6a.   Statement of Financial Position as at 31st December, 2016

	=N=	=N=
ASSETS		
Current Assets:		
Cash and Cash Equivalents	357,950 *	
Receivables	3,500,000 *	
Inventories	255,750 *	4,113,700 *
Non – Current Assets:		
Investments	300,000 *	
Property, Plant & Equipment	1,008,700 *	
Investment Property	8,081,000 *	9,389,700 *
Total Assets		13,503,400 *
LIABILITIES		
Current Liabilities:		
Short Term Loans	554,350 *	
Non- Current Liabilities:	Nil *	(554,350) *
Net Assets		12,949,050 *
NET-ASSETS/EQUITY		
Reserves	1,108,700 *	
Accumulated Surpluses	11,840,350 *	
Total Net Assets/Equity:	12,949,050 *	

6b.   Accounting Entries - SATOSTB

S/N	DETAILS	DR (=N=)	CR (=N=)	REMARK
1	Cash / Bank	15,000 *		To recognize cash receipts from the customer *
	Non-Taxable Revenue-Sales		15,000 *	
2	Accounts Receivable	210,000 *		Accrue for portion of credit sales *
	Non-Taxable Revenue-Sales		210,000 *	
3	Cash / Book	210,000 *		On receipt of the balance from the customer *
	Accounts Receivable		210,000 *	

EXAMINER'S COMMENTS

The question tested the candidates understanding of the Preparation of the Statement of Financial Position using IPSAS format from the available information provided. About 90% of the candidates attempted this question and more than 55% scoring 50% of total marks obtainable.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
MARCH 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, 31 MARCH, 2021

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

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. Mr. Banke got his data from books, newspapers, magazines, journals, online portals e.t.c. for a research. He collected …………………… data.

    A.   Simple
    B.   Primary
    C.   Secondary
    D.   Qualitative
    E.   Quantitative

2. A sampling method based on a chance mechanism with unknown choice of selection is called …………………… sampling.

    A.   Stratified random
    B.   Cluster
    C.   Random
    D.   Two-Stage
    E.   Multi-Stage

3. The table below shows the personnel in each department of an Accounting firm

Department	Number of Personnel	Pie Chart sectoral angles
Audit	36	108^0
Taxation	X	Y
Public sector	25	75^0
Human resources	29	87^0

Find the values of X and Y
A. 90^0 and 30
B. 32^0 and 90
C. 32 and 90^0
D. 30^0 and 90
E. 30 and 90^0

4. The following are the data generated from the income of three casual workers (in ₦'000): 5, 25 and 125. Compute the geometric mean

A. ₦ 5,000
B. ₦ 25,000
C. ₦ 125,000
D. ₦ 625,000
E. ₦ 650,000

5. A population consists of five observations: 1,3,5,7 and 9. Compute its Coefficient of Variation.

A. 0.556
B. 0.566%
C   55.6%
D. 56.6%
E. 57.6%

6. The following data consists of the percentage scores obtained by eight candidates in a job interview: 70, 60, 50, 55, 48, 80, 65 and 40. What is the quartile range of the score?

   A. 12
   B. 17
   C. 20
   D. 22
   E. 40

7. The table below shows the income and expenditure (in '000) of an Auditor for five months. Find the regression coefficient of x on y given that the regression model of y on x is $y = a + bx$,

   $$\sum xy = 336, \quad \sum x^2 = 264, \quad \sum y^2 = 445, \quad \sum x = 32 \, and \sum y = 45$$

Income x	2	4	6	8	12
Expenditure y	5	7	9	11	13

   A. 1200.0
   B. 810.8
   C. 1.2000
   D. 0.8108
   E. 0.1200

8. A cab operator works on Friday, Saturday and Sunday of every week. His net returns for two consecutive weeks are tabulated below:

	Net Returns (₦ '000)		
Week	Friday	Saturday	Sunday
1	12	14	16
2	15	20	13

   The moving average for Saturday of week 2 is

   A. 13
   B. 14
   C. 15
   D. 16
   E 17

9. The unit prices of 4 household items A, B, C and D from a retail store for two consecutive years are given in the table below:

Year	Prices of commodities per unit (₦)			
	A	B	C	D
2018	40	30	35	45
2019	30	25	30	35

The simple aggregate price index, using year 2018 as base year, is

A. 80%
B. 100%
C. 120%
D. 125%
E 150%

10. The probability rule of multiplication can best be represented by which of the following?

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

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

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

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

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

11. Tickets numbered 1 to 20 are mixed and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5.

A. —
B. —
C. –
D. —
E. –

12. The classification table below, which is extracted from the records of Centre for Disease Control, shows the statuses of those that contracted a deadly virus infection and their age categories for a particular area:

	Age category		
Status	Young	Adult	Aged
Those that survive	14	16	4
Those that died	2	4	10

What is the probability that an individual selected from this area will survive the infection given that he/she is an adult?

A. 0.32
B. 0.40
C. 0.50
D. 0.68
E 0.80

13. The value of x in this inequality $4x - 3 \geq 2x + 3$ is

A. $x \leq 3$
B. $x < 3$
C. $x > 3$
D. $x \geq 3$
E. $x = 3$

14. The point at which total revenue equals total cost is known as

A. Total loss
B. Break-even point
C. Marginal volume
D. Marginal cost
E. Total profit

15. The supply function of a given commodity is defined by $y = x^2$. The producers' surplus when $y_0 = 36$, is

A. 144
B. 162
C. 180
D. 216
E 432

16. The sum of GH 300,000 is invested in a business for $2\frac{1}{2}$ years at the rate of 20% compounded semi-annually. What is the accrued amount of the investment?

    A.   GH 150,000
    B.   GH 450,000
    C.   GH 473,232
    D.   GH 483,153
    E.   GH 500,000

17. An advertisement for the post of Secretary in YATCO plc., states that the post attracts an initial salary of ₦600,000 per annum with an annual increment of ₦2,000. In what year will he earn ₦614,000?

    A.   12th year
    B.   10th year
    C.   8th year
    D.   6th year
    E.   5th year

18. The Average Cost function of a commodity is given by $AC = 2Q + 5$. The Marginal Cost (MC) when $Q = 10$ is

    A.   250
    B.   205
    C.   55
    D.   45
    E.   25

19. ………………………… resources is needed for competitive activities (in an optimum way) in scientific Operation Research.

    A.   Manpower
    B.   Physical
    C.   Raw material
    D.   Scarce
    E.   Unlimited

20. In degenerate solution, the value of objective function

    A   increases infinitely
    B   is usually minimised
    C   decreases infinitely
    D   decreases exponentially
    E   is usually maximised

21. The objective function of a linear programming problem is given as Max: $Z = 3x + 4y$, where Z is contribution in GH¢, x and y are units of raw materials in hundreds. If the corner point solutions are X(8, 0), Y(0, 12), and Z (6, 8), find maximum contribution.

    A.   GH¢2400
    B.   GH¢3200
    C.   GH¢4800
    D.   GH¢5000
    E.   GH¢5800

22. The demand for an item is 60,000 units per annum. The cost of an order is ₦25 and holding cost per unit of an item is ₦2.00 per annum. The number of orders per year is

    A.   1225
    B.   1200
    C.   102.5
    D.   49
    E.   46

23. The time period between placing an order and its receipt in stock is known as ……………………… time.

    A.   Lead
    B.   Carrying
    C.   Shortage
    D.   Over
    E.   Holding

24. The following are the rules for drawing network diagram, EXCEPT that

   A. Dummy can be used for correct dangling
   B. Events or nodes must be progressively numbered
   C. Network proceeds from left to right
   D. Occasionally, avoid arrow that crosses another activity
   E. Activities that start from the same source and end at the same destination should be avoided

25. In a network diagram, the critical activities have

   A. Free float
   B. Dependent float and free float
   C. Independent float
   D. Total float
   E. No float

26. Which of the following is a policy in the sudden failure category?

   A. The group and individual replacements policy
   B. Gradual replacement policy
   C. Immediate replacement policy
   D. B and C
   E. A and C

27. Which of the following must be achieved in the optimal solution of an assignment problem in the total opportunity cost table?

   A. Draw lines horizontally or vertically through the total opportunity cost in such a manner as to minimise the number of lines necessary to cover all zero cells.
   B. Draw lines minimally to cover all zero cells in the total opportunity cost table in such a manner that number of lines drawn is equal to the number of rows or columns.
   C. Draw lines horizontally or vertically through the total opportunity cost in such a manner as to minimise the number of lines necessary to cover all non-zero cells.
   D. Draw lines horizontally or vertically through the total opportunity cost in such a manner as to maximise the number of lines necessary to cover all zero cells.
   E. Draw lines horizontally or vertically through the total opportunity cost in such a manner as to maximise the number of lines necessary to cover all non-zero cells.

28. All the following are true about Simulation, EXCEPT that

   A.   Simulation is not a trial and error approach
   B   Simulation is an act of designing a model
   C.   Simulation experiments make use of model not the system itself
   D.   The result from simulation is an approximate solution
   E.   Simulation is an imitation of the reality.

29. Consider the problem with two factories in the table below:

	Warehouse(W_1)	Warehouse(W_2)	Warehouse(W_3)	Supply
Factory A	C_{11}	C_{12}	C_{13}	10
Factory B	C_{21}	C_{22}	C_{23}	20
Demand	13	7	10	

Use the North-West Corner Method to find the sum of the allocations AW_2 and BW_3.

   A.   14 units
   B.   10 units
   C.   8 units
   D.   7 units
   E.   5 units

30. The unit transportation cost (₦'00), the quantities demanded and quantities supplied of an item from the 3 different sources to 3 different destinations are given in the table below:

Source	Destination P	Q	R	Supply
A	9	8	7	1500
B	7	6	5	x
C	8	4	3	950
Demand	y	1100	800	3250

What is the value of $x+y$?
   A.   800
   B.   950
   C.   1,350
   D.   2,150
   E   3,250

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

ATTEMPT ALL QUESTIONS

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

1.   A number is chosen at random from the first twenty-five natural numbers. What is the probability that such number is a multiple of 5?

2.   Use the table below to determine the second value of moving average of order 4

Month (x)	1	2	3	4	5	6	7	8	9	10	11	12
Sales (y)	14	24	42	19	29	38	43	58	48	43	64	78

3.   How long will it take a sum of money to double itself at an interest rate of 19% compounded quarterly?

4.   The earliest event time and the latest event time are found from the ………… of activities.

5.   One of the reasons for the study of Replacement Analysis is to know when and how best an equipment can be replaced in order to .... the total costs of .... them.

6.   The marks obtained by the students in an Accounting examination are 12, 11, 10, 7, 8,   and 16. If the mean is estimated to be 10, then the coefficient of variation is …………………

7.   The following data:
$$\sum xy = 14560, \quad \sum x^2 = 13160, \quad \sum y^2 = 16418, \quad \sum x = 350, \quad \sum y = 316$$
are obtained from the production costs (x) and returns (y) of a manufacturing company for the period 2004 to 2011. Compute the coefficient of determination, leaving your answer in 3 places of decimal.

8.   A man's salary in 1960 was ₦500 per annum and it increased by 20% each year. Find how much he earned in the years 1960 to 1964 inclusive.

9.   The total monthly revenue of Layink enterprise (in Naira) is given by the equation, ▨ = 300,000 0.5 ˙   where ▨(₦'000) is the amount spent on overheads. What is the total revenue, if ₦7,000 is spent on overheads?

10. The amount by which the objective function decreases (or increases) as a result of the availability of one unit less or more of the scarce resource is known as................................

11. Given that the annual demand is 70,000 units, the re-order quantity is 3,000 units, ordering cost is L$30 per order and holding cost per item is L$3 per annum, then total cost per annum is ....

12. The aggregate index number of a group of commodities can either be .... or.........................

13. If the following demands: 100, 150, 200, 250, 300, 350 have the corresponding probabilities: 0.05, 0.15, 0.20, 0.10, 0.20, 0.3, use the following random numbers: 43, 76, 23, 63, 08 to find the demand forecast for random number 63 using Monte Carlo's simulation method..

14. In the use of Hungarian method, an optimal assignment is reached when the number of .... is equal to number of ....

15. The solution to a transportation problem with m rows (supplies) and n columns (destination) is feasible if the number of positive allocations is ....

16. The probability of rejecting the null hypothesis when it is true is known as ....

17. The sampling technique which involves dividing the population into two or more stages in which some groups are randomly selected is called.............................. sampling.

18. Linear programming, transportation and assignment problems are some examples of .... models.

19. The three types of MEAN are Arithmetic mean, ... and .... mean.

20. The absolute measure of the return on a project is known as .... while the relative measure relating to the size and timing of the cash flows to the initial investment is known as ....

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

QUESTION 1

a.   The daily withdrawals (₦'000) from the Automated Teller Machine (ATM) of a small community microfinance bank by 5 customers are given as follows: 12, 7, 9, 7, and 10. By using the data given, calculate the

     i.   Arithmetic mean of the daily withdrawals $(1\frac{1}{2}$ Marks)
     ii.   Geometric mean of the daily withdrawals   (2 Marks)
     iii.   Harmonic mean of the daily withdrawals   (2 Marks)

b.   The volume of petrol (in ten thousands of litres) sold by 50 selected filling stations during a fuel scarcity, in a particular local government area, is tabulated as follows:

Volume	Number of filling stations
0.6 – 1.5	10
1.6 – 2.5	8
2.6 – 3.5	12
3.6 – 4.5	7
4.6 – 5.5	6
5.6 – 6.5	4
6.6 – 7.5	3

Calculate the:
     i.   Modal quantity of fuel $(2\frac{1}{2}$ Marks)   ii.   Median quantity of fuel
$(2\frac{1}{2}$ Marks)   iii. 7th decile quantity of fuel
$(2\frac{1}{2}$ Marks)
(Total $12\frac{1}{2}$ Marks)

QUESTION 2

The following table shows the book value (Y) and the age (X) of equipment.

Age (in years)	Book Value (₦'000)
1	40
2	38
3	25
4	20
5	12
6	5

a. Derive a regression equation to explain the relationship between the age of the equipment and the book value. (8 Marks)

b. Compute the Pearson's correlation coefficient between X and Y. (2 Marks)

c. Compute the standard error of the estimate. $(2\frac{1}{2}$ Marks)

(Total $12\frac{1}{2}$ Marks)

QUESTION 3

a. An amount of GMD35,000 is invested at 14% for 17 years.

    i. Calculate the Simple and Compound Interests. (5 Marks)

    ii. How much will it amount to at the end of 17 years based on the simple interest calculated in a(i) above? (2 Marks)

b. For an essay writing competition, a total of four students that competed received a cash prize. The first prize was GMD2,000. Each prize is GMD500 less than the first prize.

    i. What was the total sum of cash given out to students for the essay writing competition? $(2\frac{1}{2}$ Marks)

    ii. Find the number of terms in the geometric progression 6, 12, 24, ..., 1536 (3 Marks)

(Total $12\frac{1}{2}$ Marks)

QUESTION 4

A company runs a production line that contains 250 identical components. They fail on a regular basis according to the following table

Life span (months)	Observed frequency
1	6
2	14
3	20
4	30
5	15
6	10
7	5

a. Determine the probabilities distribution of the life span $(3\frac{1}{2}$ Marks)

b. Determine the expected life span $(5\frac{1}{2}$ Marks)

c. Calculate the average number of components replaced in the period? $(3\frac{1}{2}$ Marks)

(Total $12\frac{1}{2}$ Marks)

QUESTION 5

A local contractor has been awarded to construct a state-of-the-art bus terminal in the state's secretariat. The contractor divided the stages of the project into 12 activities. The table below gives the activity, preceding activity and estimated activity duration:

Activity	Preceding Activity	Activity duration (weeks)
K	–	4
L	–	8
M	K	5
N	K	9
O	K	3
P	M	7
Q	M	5
R	M	3
S	L,N	5
T	P,S	3
U	Q,T	5
V	O,R	4

a.   Construct the Activity – On – Arrow network diagram for the project.   (6 Marks)

b.   Determine all possible paths and their durations $(3\frac{1}{2}$ Marks)

c.   Identify the critical path and its duration   (2 Marks)

d.   State the shortest completion time for the project   (1Mark)

(Total $12\frac{1}{2}$ Marks)

QUESTION 6

a.   The AJAX production company produces four varieties of chocolate: C_1, C_2, C_3 and C_4. For quality assurance purposes, the customers were asked, through copies of questionnaire, to indicate their choices. The pieces of information about daily consumptions of the chocolate based on the customers' responses are given as follows:

Chocolate	C_1	C_2	C_3	C_4
Number of customers' response	14	9	15	12

You are required to

i.   Use the above information to simulate the next 10 results using the
      following random numbers: 15, 20, 87, 09, 34, 56, 60, 07, 75 and 40.
                                                        $(4\frac{1}{2}$ Marks)

ii.   Based on your answer in (i) above, advise the producer on how the
      variety of chocolate that has the least consumption can be improved
      upon.   (2 Marks)

b. The information about the number of cars arriving for parking (per hour) and
    their associated probabilities, in a particular garage, is given as follows:

Arriving time (hour)	4	5	6	7	8
Probability	0.1	0.15	0.25	0.30	0.20

You are required to

i.   Simulate the next 10 results using the following random numbers: 52,
      37, 82, 69, 98, 96, 33, 50, 27 and 50.   (5 Marks)

ii.   Estimate the average number of cars arriving at the park per hour on the
      basis of the simulated frequency.   (1 Mark)
                                                       (Total 12½ Marks)

FORMULAE

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

Economic Order Quantity

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

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

Slope of a regression equation

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

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

The 95% confidence interval for μ

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

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

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

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

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

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

EOQ with stock-out

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

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

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

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

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

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

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 $= \dfrac{Q}{d}$

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

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

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

SECTION A: PART I   MULTIPLE- CHOICE SOLUTIONS

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

28. A

29. B

30. D

WORKINGS (MCQ)

3. Sum of angles for the sector is 360^0

   $108^0 + Y + 75^0 + 87^0 = 360^0$

   $Y = 360^0 - 270^0$

   $Y = 90^0.$

   Let Z represent total personnel of the firm

   Angle of sector for Auditor department $= \dfrac{36}{Z} \times 360° = 108°$

   $$Z = \dfrac{36 \times 360°}{180°} = 120$$

   Angle of sector for Taxation department $= \dfrac{x}{120} \times 360° = 90°$

   $$x = \dfrac{120 \times 90°}{360°} = 30$$

   30 and 90^0 (E)

4. $GM = \sqrt[3]{5 \times 25 \times 125} = 5^{(1+2+3) \times 1/3} = 5^2 \times 1000 = ₦25,000$ (B)

5. x = 1,3,5,7,9

   $\bar{x} = \dfrac{\sum x}{n} = \dfrac{25}{5} = 5$

$$s^2 = \frac{\sum(x-\bar{x})^2}{n} = \frac{16+4+0+4+16}{5} = 8$$

$$s^2 = \sqrt{8} = 2.83$$

$$CV = \frac{s}{\bar{x}} \times 100 = \frac{2.83}{5} \times 100 = 56.6\% \qquad \textbf{(D)}$$

6. Arranging the data in an ascending order of magnitude

   40, 48, 50, 55, ⇓ 60, 65, 70, 80

   Since n = 8, Q_1 is the median of 40, 48, 50, 55

   i.e $Q_1 = \frac{48+50}{2} = \frac{98}{2}$

   $Q_1 = 49$

   Q_3 is the median of 60, 65, 70, 80

   i.e $Q_3 = \frac{65+70}{2} = \frac{135}{2}$

   $Q_3 = 67.5$

   $Quartile\ range = Q_3 - Q_1 = 67.5 - 49 = 18.5 \qquad \textbf{(B)}$

7. For regression of y on x : $y = a + bx$ where b is given as

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

   for regression of x on y : $x = a^1 + b^1 y$ where b is given as

   b^1 = $\frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum y^2) - (\sum y)^2}$ and a^1 = $\frac{\sum x}{n} - b^1 \frac{\sum y}{n}$

   Regression coefficient of x on y is b^1 = $\frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum y^2) - (\sum y)^2}$ = $\frac{5(335) - (32)(45)}{5(445) - 45^2}$

   $$= \frac{1680 - 1440}{2225 - 2045} = \frac{240}{200} = 1.2 \qquad \textbf{(C)}$$

8.

Week	Day	Returns	3-day Moving total	3-day Moving average
1	Fri	12		
1	Sat	14	42	14
1	Sun	16	45	15

2	Fri	15	51	17
2	Sat	20	48	16
2	Sun	13		

The moving average for Saturday week 2 is 16   **(D)**

9.

$$Simple \; Aggregate \; Pr ice \; Index , SAPI = \frac{\sum P_{2019}}{\sum P_{2018}} \times 100$$

$$SAPI = \frac{30 + 25 + 30 + 35}{40 + 30 + 35 + 45} \times 100$$

$$SAPI = \frac{120}{150} \times 100 = 80\% \qquad \textbf{(A)}$$

11. $\square = $ 1,2,3, 4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20

Let $\square = $ ▢▢▢▢ ▢▢▢▢ ▢▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢ 3 ▢▢ 5

$$\square = \text{3,6,9,12,15,18,5,10,20}$$

$$\square \; \square \; = \text{———} = \text{—} \qquad (\square)$$

12.   Let S represent Surviving
Let A represent Adult

$$P(S / A) = \frac{P(S \cap A)}{P(A)} = \frac{\frac{16}{50}}{\frac{20}{50}} = \frac{16}{20} = 0.8 \qquad \textbf{(E)}$$

13. $4\square - 3 \geq 2\square + 3$

$4\square - 3 + 3 \geq 2\square + 3 + 3$

$4\square \geq 2\square + 6$

$4\square - 2\square \geq 6$

$2\square \geq 6$

$\square \geq - => \square \geq 3 \qquad (\square)$

15. $y = x^2$

$x = y^{\frac{1}{2}}$

$x_0 = \left(y_0\right)^{\frac{1}{2}}$

When $y_0 = 36, \quad x_0 = (36)^{\frac{1}{2}}, \quad x_0 = 6$

Producers' surplus $= (x_0 y_0) - \int_0^{x_0} f(x)dx$

$$= (x_0 y_0) - \int_0^{x_0} f(x)dx$$

$$= (6) \times (36) - \int_0^6 x^2 dx$$

$$= 216 - \left|\frac{x^3}{3}\right|_0^6$$

$$= 216 - \left(\frac{6^3}{3}\right)$$

$$= 216 - 72$$

$$= 144$$

(A)

Alternatively,

$$y = x^2$$

$$x = y^{\frac{1}{2}}$$

When $x_0 = 0$, $y_1 = 0$

Producers' surplus $= \int_{y_1}^{y_0} g(y)dy$

$$= \int_0^{36} (y)^{\frac{1}{2}} dy$$

$$= \left|\frac{2 \times y^{\frac{3}{2}}}{3}\right|_0^{36}$$

$$= \frac{2}{3} \times (36)^{\frac{3}{2}} - 0$$

$$= 144 \qquad\qquad\text{(A)}$$

16. $A = P(1 + r)^n$,

where $n = 2 \times 2\frac{1}{2} = 5$

$$r = \frac{20\%}{2} = 10\% = 0.1$$

$P = ₦\,300{,}000$

$A = 300{,}000(1 + 0.1)^5$

$A = 300{,}000(1 + 0.1)^5$

$A = ₦\,483{,}153$

(D)

17. The salary is an AP with $a = 600,000$, $d = 2000$ $L = 614,000$

Since the last term of AP is $L = a + (n-1)d$

$614,000 = 600,000 + (n-1) \times 2000$

$614,000 = 600,000 + 2000n - 2000$

$614,000 = 598,000 + 2000n$

$16,000 = 2000n$

$n = 8\, years$ (C)

18. $AC = 2Q + 5$

$TC = Q \times (AC)$

$TC = Q \times (2Q + 5)$

$\quad = 2Q^2 + 5Q$

$MC = \dfrac{d(TC)}{dQ}$

$\quad = 4Q + 5$

For $Q = 10$,

$MC = 4 \times 10 + 5$

$MC = 45$ **(D)**

21. X(8, 0): Z = 3(8) + 0 = 24

Y(0, 12): Z = 0 + 4(12) = 48

Z (6, 8): Z = 3(6) + 4(8) = 50

Therefore, maximum contribution = 50 x 100

= GH₵ 5000   **(D)**

22.

    ☐ = 25, ☐ = 60,000, $h = 2$

    ☐ = $\dfrac{\overline{\quad\quad}}{\quad}$ = $\dfrac{\overline{\times \quad \times \quad ,}}{\quad}$ = 1225

    ∴ ☐ ☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

    $\dfrac{\quad\quad\quad}{\quad\quad}$ = $\dfrac{\quad ,}{\quad}$ = 48.97 ≈ 49   **(D)**

29.

	W_1	W_2	W_3	Supply
A	10	-	-	10
B	3	7	10	20
Demand	13	7	10	30

Sum of the allocation AW2 + BW3 = 0 + 10 = 10   **(B)**

30. For Supply column:

$$1,500 + x + 950 = 3,250$$
$$2,450 + x = 3,250$$
$$x = 3,250 - 2,450$$
$$x = 800$$

For Demand column:

$$y + 1,100 + 800 = 3,250$$
$$y + 1,900 = 3,250$$
$$y = 3,250 - 1,900$$
$$y = 1,350$$
$$\Rightarrow x + y = 800 + 1,350 = 2,150 \qquad \textbf{(D)}$$

EXAMINER'S COMMENTS

This is a compulsory section made up of 30 objective questions with 5 possible options. Students are expected to answer ALL the questions. Generally, all the 30 questions, mostly, cover all the segments of the syllabus.

The average score is 16 marks out of the maximum 30 marks allocated.

SECTION A: PART II   SHORT -ANSWER SOLUTIONS

1. $\frac{1}{5}$ or 0.2

2.   30.25

3.   3.7 years/3.73 years/ 3.734 years/3.7337 years/ 4 years

4.   Duration

5.   Minimize, maintaining (in that order)

6.   30%

7.   0.721

8.   ₦3,720.80

9.   ₦10,047.88

10.   Shadow cost/shadow price/dual price

11.   L$5,200

12.   Weighted, unweighted

13.   300 units/300

14.   Covered lines, rows / columns

15. $m + n - 1$

16.   Significance level

17.   Multi–Stage

18.   Allocation

19.   Harmonic mean/ Geometric mean, Geometric/Harmonic

20.   NPV/Net present value, IRR/Internal Rate of Return (in that order)

WORKINGS (SAQ)

1.   Let A = Event of multiples of 5
   $n(A) = 5, \; i.e \; 5, 10, 15, 20, 25$

   $$p(A) = \frac{n(A)}{n(S)} = \frac{5}{25}$$

2.

Month(x)	Sales (y)	4 – Month moving total	2 of 4 – Month moving total	4 – Month average
1	14			
2	24			
		99		
3	42		213	26.63
		114		
4	19		242	30.25
		128		
5	29		257	32.13
		129		
6	38		297	37.13
		168		
7	43		355	44.38
		187		
8	58		379	47.38
		192		
9	48		405	50.63
		213		
10	43		446	55.75
		233		
11	64			
12	78			

The second value of moving average of order 4 is 30.25

3. Compound interest formula

A = P (1 + r)ⁿ,

Since interest is compounded quarterly, then

$$A = P\left(1 + \frac{r}{4}\right)^{4n}$$

Since A = 2P given,

Therefore, $2P = P\left(1 + \frac{0.19}{4}\right)^{4n}$

2 = (1 + 0.0475)⁴ⁿ

$$n = \frac{0.3010}{4 \times 0.02015}$$

$n = 3.7337 = 4$

Answer is: 4 years or 3.7337 years

6. $Mean = \dfrac{\sum X}{n} = 10$

where $n = 7$

$\sum X = 12 + 11 + 10 + 7 + 8 + U + 16$

$\sum X = 64 + U$

$\therefore 10 = \dfrac{64 + U}{7}$

$70 = 64 + U$

$U = 70 - 64$

$U = 6$

Coefficient of variation $= \dfrac{SD}{Mean} \times \dfrac{100}{1}$

Coefficient of variation $= \dfrac{\sqrt{Variance}}{\bar{x}} \times \dfrac{100}{1}$

Coefficient of variation $= \dfrac{\sqrt{10}}{10} \times \dfrac{100}{1}$

Coefficient of variation $= \dfrac{3.162}{10} \times \dfrac{100}{1}$

Coefficient of variation $= 0.3162 \times 100 = 31.62\%$

7. Coefficient of determination = r^2 where r is the correlation coefficient given as follows

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

$$r = \sum xy = 14560, \quad \sum x^2 = 13160, \quad \sum y^2 = 16418, \quad \sum x = 350, \quad \sum y = 316$$

$$r = \frac{8(14560) - (350)(316)}{\sqrt{[8(13160) - (316)^2][8(16418) - (350)^2]}} = \frac{5880}{6926} = 0.84897$$

Coefficient of determination = r^2 = $(0.84897)^2$ = 0.7207 ≈ 0.721 (3 d.p)

8. Salary in 1960 =N500, increment is r = 20% + 100% =120% = 1.2
n=5

This salary follows GP

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$S_5 = \frac{500(1.2^5 - 1)}{1.2 - 1}$$

$$S_5 = ₦3,720.80$$

9. ⯑ = —— = 7, since ⯑ is in thousands of naira

⯑ = 300,000 0.5 · ( )

⯑ = 300,000 0.5 ·

R = 300,000 × 0.03349292

R = ₦10,047.88

11. .⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑ = ⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑ + h⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑⯑

= — + —

= ——— + ——— = ——— + —— = 700 + 4500

= ₦5,200

Demand	100	150	200	250	300	350
Probability	0.05	0.15	0.20	0.10	0.20	0.30
Cum.prob.	0.05	0.20	0.40	0.50	0.70	1.00

13.

Random number range	0 – 4	5 - 19	20- 39	40- 49	50- 69	70 - 99

The demand for Random Number 63 = 300 units

EXAMINER'S COMMENTS

This is a compulsory section made up of 20 short-answer questions. Students are expected to answer ALL the questions. As usual, all the questions normally cover the essential parts of the syllabus.
The average score is 8 marks out of maximum 20 marks allocated.

THEORY

SOLUTION 1

a.   i.   Arithmetic Mean, AM $= \dfrac{\sum\limits_{i=1}^{n} x_i}{n}$

$$AM = \frac{12+7+9+7+10}{5}$$

$$AM = \frac{45}{5}$$

$$AM = 9$$

Therefore, the Arithmetic Mean daily withdrawal is ₦9,000

ii.   Geometric Mean, GM $= \sqrt[n]{x_1 \cdot x_2 \cdots x_n}$

$$GM = \sqrt[5]{12 \times 7 \times 9 \times 7 \times 10}$$
$$GM = \sqrt[5]{52,920}$$
$$GM = 8.804890658$$

Also accept:
8.8, 8.80, 8.805, 8.8049, 8.80489

Therefore, the Geometric Mean daily withdrawal is ₦8,804,89

iii.   Harmonic Mean, HM $= \dfrac{n}{\sum\limits_{i=1}^{n} \dfrac{1}{x_i}}$

$$HM = \frac{5}{\dfrac{1}{12}+\dfrac{1}{7}+\dfrac{1}{9}+\dfrac{1}{7}+\dfrac{1}{10}}$$

for 1dp,

$$HM = \frac{5}{0.1+0.1+0.1+0.1+0.1}$$

$$HM = \frac{5}{0.5} \quad = 10$$

Therefore, the Geometric Mean daily withdrawal is ₦10,000.00

OR For 2dp,

$$HM = \frac{5}{0.08+0.14+0.11+0.14+0.10}$$

$$HM = \frac{5}{0.083+0.143+0.111+0.143+0.1}$$

$$HM = \frac{5}{0.57}$$

HM = 8.771929825

Also accept:

8.7, 8.77, 8.7719 and 8.77193

Therefore, the Harmonic Mean daily withdrawal is ₦8,771.93

OR For 3dp,

$$HM = \frac{5}{0.083+0.143+0.111+0.143+0.100}$$

$$HM = \frac{5}{0.58}$$

HM = 8.620689655

Also accept:

8.6, 8.62, 8.621, 8.6207 and 8.62069

Therefore, the Harmonic Mean daily withdrawal is ₦8,620.69

OR For 4dp,

$$HM = \frac{5}{0.0833+0.1429+0.1111+0.1429+0.1}$$

$$HM = \frac{5}{0.5802}$$

HM = 8.617718028

Also accept:

8.6, 8.62, 8.618, 8.6177 and 8.61772

Therefore, the Harmonic Mean daily withdrawal is ₦8,617.72

b.

Class interval	f	cf
0.6 – 1.5	10	10
1.6 – 2.5	8	18
2.6 – 3.5	12	30
3.6 – 4.5	7	37
4.6 – 5.5	6	43
5.6 – 6.5	4	47
6.6 – 7.5	3	50

i.   Mode =

Modal
with the

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

class = 2.6 – 3.5 (i.e class highest frequency of 12)

$L_{mo} = 2.55$ $\Delta_1 = 12 - 8 = 4$

$\Delta_2 = 12 - 7 = 5$ $and\ c = 1.0$

$$\text{Mode} = 2.55 + \left(\frac{4}{4+5} \right) 1.0$$

Mode = 2.55 + 0.444444
Mode = 2.994444
Modal quantity of fuel $= 2.994444 \times 10,000 = 29,94444\ litres$
Also accept – Mode $= 2.95$
Modal quantity =   29,500 litres
Mode =   2.99
Modal quantity =   29,900 litres
Mode =   2.994
Modal quantity =   29,940 litres
Mode =   2.9944
Modal quantity =   29,944 litres
Mode =   2.994444
Modal quantity =   29,944.4 litres

ii.   Median $= L_{me} + \left(\dfrac{\dfrac{N}{2} - \sum f_{me}}{f_{me}} \right) c$

Median position $= \dfrac{N}{2} th$

$$= \dfrac{50}{2} th = 25th$$

Median class $= 2.6 - 3.5$

$L_{me} = 2.55 \quad \sum f_{me} = 18$
$F_{me} = 12 \quad and \quad c = 1.0$

Median $= 2.55 + \left(\dfrac{25 - 18}{12} \right) 1.0$

Median $= 2.55 + 0.583333$
Median $= 3.133333$
Median quantity of fuel
   $= 3.133333 \times 10,000$
   $= 31,333.33$ litres

iii.   7th decile $= D_7$

$D_7 = L_{D_7} + \left(\dfrac{\dfrac{7}{10} N - \sum f_{D_7}}{f_{D_7}} \right) c$

$$= \dfrac{7 \times 50}{10} th = 35th$$

$D_7 \; class = 3.6 - 4.5$

$L_{D_7} = 3.55, \quad \sum f_{D_7} = 30$

$F_{D_7} = 7 \quad and \quad c = 1.0$

$D_7 = 3.55 + \left(\dfrac{35 - 30}{7} \right) 1.0$

$D_7 = 3.55 + 0.714285$

$$D_7 = 4.264285$$

Therefore, 7th decile quantity of fuel
$$= 4.264285 \times 10,000$$
$$= 42,642.85 \text{ litres}$$

Also, accept
- $D_7 = 4.3$ $=$ 43,000 litres
- $D_7 = 4.26$ $=$ 42,000 litres
- $D_7 = 4.264$ $=$ 42,640 litres
- $D_7 = 4.2643$ $=$ 42,643 litres
- $D_7 = 4.26428$ $=$ 42,642.8 litres

EXAMINER'S COMMENTS

The question tests candidates' knowledge of the Concept of MEASURES OF CENTRAL TENDENCY.

Specifically, candidates are required to calculate (i)the three forms of the MEAN i.e Arithmetic mean, Geometric mean & Harmonic mean; Mode; Median and (ii) the 7th Decile.

The question was attempted by about 95% of the candidates with an average score of 7 marks out of maximum 12.5 marks allocated.
The greatest pitfall of the candidates that attempted the question was their inability to compute the Harmonic Mean and the 7th Decile.
Candidates are advised to learn more on Measures of Location.

SOLUTION 2

(a)

Age (X)	Book Value (Y) ('000)	XY ('000)	X²	Y² ('000)
1	40	40	1	1,600
2	38	76	4	1,444
3	25	75	9	625
4	20	80	16	400
5	12	60	25	144
6	5	30	36	25
$\sum X = 21$	$\sum Y = 140$	$\sum XY = 361$	$\sum Y = 91$	$\sum Y\,2 = 4238$

The regression equation explaining the relationship between the age of the equipment (X) and the book value (Y) is given as:

$$\ddot{y} = \ddot{a} + \ddot{b}x$$

Where

$$\ddot{b} = \frac{\sum XY - \dfrac{\sum X \sum Y}{n}}{\sum X^2 - \dfrac{\left(\sum X\right)^2}{n}}$$

$$= \frac{361 - \dfrac{21 \quad 140}{6}}{91 - \dfrac{21}{6}}$$

$$= \frac{-129}{17.5} \qquad = -7.371$$

$$= -7.371428571$$

(for b, accept: -7.3, -7.37, -7.371, -7.3714, -7.37143 or -7371.43)

-

$$\ddot{a} = \frac{\sum Y}{n} - \dot{b} \frac{\sum X}{n}$$

$$= \frac{140}{6} - (-7.371)\left(\frac{21}{6}\right)$$

$$= \ 23.333 \ + \ 25.799$$

$$= \ 49.132$$

(for a, accept: **49.1, 49.13, 49.133, 49.1333, 49.13334 or 49133.34**)

The regression equation is

$$\dot{y} = 4913334 - 737143X$$

b.

$$= \frac{361 - \dfrac{(21)(140)}{6}}{\sqrt{\left[91 - \dfrac{(21)^2}{6}\right]\left[4328 - \dfrac{(140)^2}{6}\right]}}$$

$$= \frac{-129}{\sqrt{(17.5)(1061.33)}}$$

$$= \frac{-129}{136.284}$$

$$= \ \text{-} \ 0.9465527868$$

(for r, also accept: **-0.9, -0.95, -0.947 or -0.9466**)

c. Standard Error = 🔲🔲 = $\overline{\begin{array}{ccc} \Sigma & \Sigma & \Sigma \end{array}}$

$$🔲🔲 = \frac{\overline{\qquad\qquad\qquad\qquad}}{\qquad . \qquad\qquad . \qquad}$$

$$🔲🔲 = \frac{4238 \ - \ 6878.48 + \ 2 + \ 660.931}{4} =$$

$$S_e = \frac{\sqrt{6898.931 - 6878.48}}{4}$$

$$S_e = \frac{\sqrt{20.451}}{4} =$$

$$S_e = \sqrt{5.11275}$$

$$S_e = 2.261139093$$

For S_e, also accept 2.3, 2.26, 2.261, 2.2611 or 2.26114

The standard error of the estimate is 2,261.14

EXAMINER'S COMMENTS

This question is on the concept of CORRELSTION and REGRESSION.
Specifically, the candidates are expected to:
(i) derive a regression equation or to fit regression line;
(ii)calculate the Pearson's Correlation Coefficient and
(iii)to compute the corresponding Standard Error.
About 80% of the candidates attempted the question with an average score of 8 marks out of maximum 12.5 marks.

The major pitfall of the candidates that attempted the question was in their inability to handle large figures.

Candidates should practise more questions involving large figures.

SOLUTION 3

a. i. $P = ₦35000, r = \text{——} = 0.14,$

$$t = 17$$

$$Simple\ Interest = P \times r \times t = 35,000 \times 0.14 \times 17$$

$$Simple\ Interest = ₦83,300$$

$$Total\ Amount = Principal - Interest$$

i.e   C.I = A – P

where A = P(i+r)

A = 35,000 (1 + 0.14) 17

A = 35,000 (9.276464197)

A = 324,676.25

(For A, also accept any value within the range of 324,676.25 to 325,500)

Therefore, C.I = 324, 676.25 – 35,000

C.I = GMD 289, 676.25

For C.I, also accept any value within the range of 289,676.25 to 290,500

ii.   Amount = □   □   □

Amount = 35,000 + 83,300

Amount = GMD 118,300

A LITER for a(ii)

□   □ 1   □□

□   35,000 [1 + (0.14) (17)]

□   GMD 118,300

b.i.   □   4, □   2000 □□□□   – 500

□□ $\frac{□}{2}$ 2□   □   1 □

□4 $\frac{4}{2}$ 2 2000   4 – 1   500

2   4000   3   500

2 4000   1500

2 2500

□□ □ 5,000

ii.   6, 12, 24, ... 1536

$$r = \frac{12}{6} = 2$$

1539 6 2

256 2

2 2

8 1

8 1

9

Hence, there are 9 terms

EXAMINER'S COMMENTS

Candidates' knowledge of the concept of MATHEMATICS OF FINANCE is tested in d question. This is a direct application of the Sequences and Series to business problems. Specifically, candidates are required, in Part (a) to compute Simple Interest, Compound Interest and the Amount, based on the Simple Interest calculated earlier on. Part(b), on the other hand, candidates are required to apply (i) the Arithmetic Progression Formula to compute the total sum based on the Simple Interest calculated earlier on and(ii) Geometric Progression Formula to find the number of the given series.

About 75% of the candidates attempted the question with an average score of 8 marks out of the maximum 12.5 marks allocated.

The major pitfall identified was the inability of some of the candidates to understand what the question actually requires.
Candidates should learn more on both the Arithmetic & Geometric Progressions for their future examinations.

SOLUTION 4

a.

Life span x	Obsev. Frequency	Prob. Distributions
1	6	0.06 (½)
2	14	0.14 (½)
3	20	0.20 (½)
4	30	0.30 (½)
5	15	0.15 (½)
6	10	0.10 (½)
7	5	0.05 (½)

b.

x	P(x)	xP(x)
1	0.06	0.06
2	0.14	0.28
3	0.20	0.60
4	0.30	1.20
5	0.15	0.75
6	0.10	0.60
7	0.05	0.35

Expected life span in months = $\sum X P(X)$

= 3.84 (1½)   (-½ with no unit "month")

C.   Average number replaced in the period $= \dfrac{total\ no.of\ items\ used\ per\ period}{Average\ life\ span}$

$$= \dfrac{250}{3.84}$$

$$= 65.10$$

$$= 66$$

EXAMINER'S COMMENTS

The question is on REPLACEMENT ANALYSIS.
Specifically, candidates are required to:
(i)determine the probability distributions;
(ii)determine the expected life span and
(iii)calculate the average number of components replaced in the given period.
About 75% of the candidates attempted the question with an average score of 8 marks out of the maximum 12.5 marks allocated.
Some of the candidates that attempted the question had difficulty in determining d Expected Life Span of the components.

Candidates should know that the Expected Life Span is Sum of all the products of probability and the number of months for which d components fail.

SOLUTION 5

a.   The network diagram
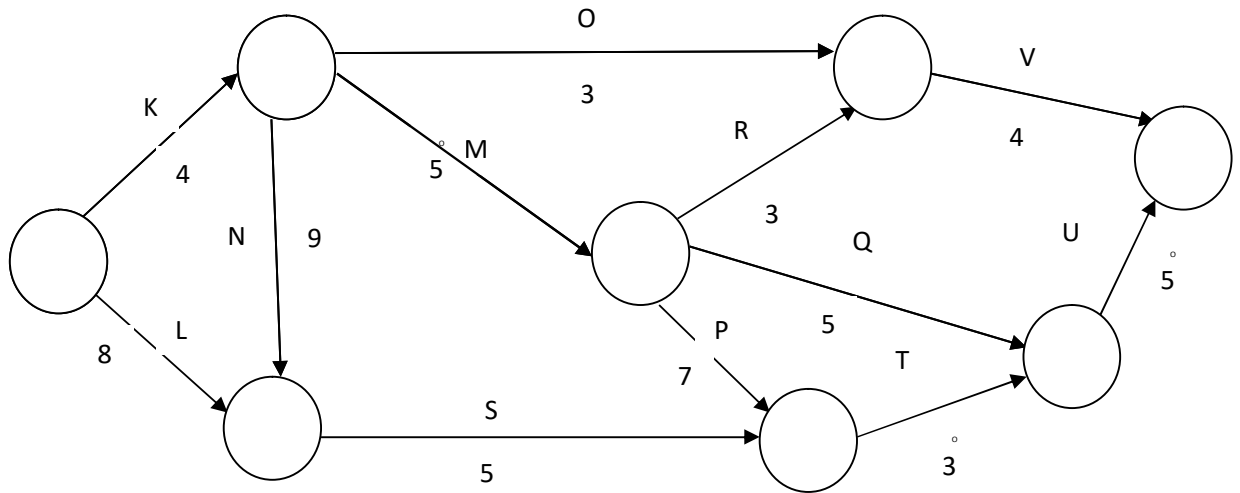
* Without arrows, score is zero

b.

Paths	Durations
K → O → V	4+3+4 = 11 weeks
K → N → S → T → U	4+9+5+3+5 = 26 weeks
L → S → T → U	8+5+3+5 = 21 weeks
K → M → P → T → U	4+5+7+5+5 = 24 weeks
K → M → Q → U	4+5+5+5 = 19 weeks
K → M → R → V	4+5+3+4 = 16 weeks

c.   The critical path is   K → N → S → T → U
       and its duration is 26 weeks

d.   The shortest completion time for the project is 26 weeks

The question tests the candidates' knowledge of NETWORK ANALYSIS.
Specifically, the candidates are expected to:
(i) be able to draw the Activity-On-Arrow Network Diagram for the given project;
(ii) determine(from the diagram drawn)all the possible paths and their durations;
(iii) identify the critical path & its duration and
(iv) state the shortest completion time for the project.
Candidates should know that "shortest completion time" is the same as the "critical duration".
About 50% of the candidates attempted the question with an average score of 6 marks out of the maximum 12.5 marks allocated.

Greater number of the candidates that attempted the question could not cope with many Activities demanded by the Network Diagram.
Candidates are advised to practise drawing Network Diagrams that involve many Activities for their future examinations.

SOLUTION 6

a.

Chocolate	Frequency	Probability	Cumulative Probability	Range interval
C_1	14	0.28	0.28	00 – 27
C_2	9	0.18	0.46	28 – 45
C_3	15	0.30	0.76	46 – 75
C_4	12	0.24	1.00	76 – 99

i. The simulation of the next 10 results is therefore carried out as tabulated in the table below.

Random number	Corresponding chocolate
15	C_1
20	C_1
87	C_4
09	C_1
34	C_2
56	C_3

60	C_3
07	C_1
75	C_3
40	C_2

ii.   The simulation results are summarised in the table below

Chocolate	Simulated Frequency
C_1	4
C_2	2
C_3	3
C_4	1

Also, accept

C_4 has the least consumption

bi.

Time	Probability	Cumulative Probability	Random number interval
4	0.10	0.10	00 – 09
5	0.15	0.25	10 – 24
6	0.25	0.50	25 – 49
7	0.30	0.80	50 – 79
8	0.20	1.00	80 – 99

The simulation of the next 10 results is therefore carried out and the results are tabulated below:

Car arriving time (hr)	Random number	Simulated arriving time
1	52	7
2	37	6
3	82	8
4	69	7
5	98	8
6	96	8
7	33	6
8	50	7
9	27	6
10	50	7
		$\sum m = 70$

ii.   The average number of cars arriving per hour $= \dfrac{70}{10}$

$= 7$ cars

EXAMINER'S COMMENTS

Concept of SIMULATION is the subject matter of this question.
Specifically, candidates are required to know how to use probabilities to assign random number ranges based on the cumulative probabilities derived from the given probability distributions.

About 75% of the candidates attempted the question with an average score of 8.5 marks out of the maximum 12.5 marks allocated.

Generating the desired random number ranges was the difficulty encountered by some of the candidates. This made it very difficult for them to simulate the given random numbers.

THE ASSOCIATION OF ACCOUNTANCY BODIES IN WEST AFRICA

ACCOUNTING TECHNICIANS SCHEME, WEST AFRICA
MARCH 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, 30 MARCH, 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 – MARCH 2021

INFORMATION TECHNOLOGY

Time Allowed: 3 hours

SECTION A: PART 1   MULTIPLE-CHOICE QUESTIONS   (30 Marks)

ATTEMPT ALL QUESTIONS IN THIS SECTION

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

1.   Which of the standard coding form has each of its character coded using 7 bits?

A.   ABCD
B.   ASCII
C.   BCD
D.   BCDE
E.   EBCDIC

2.   Convert the binary number 100111 to a decimal number.

A.   39
B.   38
C.   37
D.   36
E.   35

3.   Which of the following is NOT the key element in the definition of a Computer System?

A.   Electronic Machine
B.   Reject data
C.   Stores data and information
D.   Processes the data into information
E.   Make information available to end users

4.   Which of the following is NOT a feature of Mainframe Computers?

   A.   Can be moved around
   B.   Is a large system
   C.   Generates a lot of heat
   D.   Is normally housed in air-conditioned room
   E.   Is very expensive

5.   Which one of the following is NOT a type of Microcomputers?

   A.   Desktop
   B.   Workstation
   C.   Suite case
   D.   Laptop
   E.   Notebook

6.   ALU can perform the following operations, EXCEPT

   A.   Addition and Subtraction
   B.   Multiplication and Division
   C.   Exponentiation
   D.   Coordination
   E.   Logical Operations

7.   Control unit can perform the following operations, EXCEPT

   A.   Receives instruction in a program, one at a time from the memory
   B.   Comparison
   C.   Interprets the instructions
   D.   Send out control signals to the peripheral devices
   E.   Coordinate all the activities in the system

8.   Which of the following is NOT an Optical Storage Media?

   A.   CD-ROM
   B.   DVD-ROM
   C.   Video Tape Recorder
   D.   WORM
   E.   DVD-RAM

9. Which of the following is NOT a Magnetic Storage Media?

   A. CD-ROM
   B. Magnetic disk
   C. Winchester disk
   D. Cartridge disk
   E. Magnetic tapes

10. SVGA is an acronym for

   A. Special Versatile Graphic Array
   B. Super Versatile Graphic Adapter
   C. Super Versatile Graphic Array
   D. Super Video Graphic Adapter
   E. Super Video Graphic Array

11. Which of the following is NOT a type of System Software?

   A. Operating System
   B. Moduler
   C. Loaders
   D. Debuggers
   E. Editors

12. A program which translates a user's code written in low level language into the machine code is called

   A. Assembler
   B. Compiler
   C. Interpreter
   D. Moduler
   E. File Manager

13. Utility programs perform the following operation, EXCEPT

   A. File copy
   B. Housekeeping operations
   C. Sorting
   D. Disk formatting
   E. Record Keeping

14. A Database Management System must ensure the following, EXCEPT

    A. Easy data storage
    B. Consistency in data organisation
    C. Data redundancy
    D. Rapid access to data
    E. Easy data retrieval

15. Application packages can be acquired from the following sources, EXCEPT

    A. Computer Bureaux and Information centre
    B. Software Houses
    C. Software Vendors
    D. Softloading
    E. In-house developers

Use the table below to answer Question 16 – 19

S/No	Products Code	Monday (₦)	Tuesday (₦)	Wednesday (₦)	Thursday (₦)	Friday (₦)
1.	Ref10000010	25563	355625	255555	144333	35522
2.	Ref10000020	42256	35422	45556	41112	55521
3.	Ref10000030	55555	544233	355544	52223	44447
4.	Ref10000040	44456	44455	422554	522223	12345
5.	Ref10000050	33421	67778	355544	777714	45512

16. How many data fields can exist in the table above?

    A. 1
    B. 4
    C. 5
    D. 6
    E. 7

17. How many data records can exist in the table above?

    A. 1
    B. 4
    C. 5
    D. 6
    E. 7

18. How many data files exist in the table above?

    A. 1
    B. 4
    C. 5
    D. 6
    E. 7

19. Which of the following is NOT an example of primary key?

    A. Customer number in a customer ledger record
    B. Stock code number in a stock record
    C. Employee PIN in a payroll record
    D. Student name in a student record
    E. BVN in a bank

20. Which of the following is NOT a characteristic of a file?

    A. Hit rate
    B. Volatility
    C. Size
    D. Access time
    E. Level rate

21. A set of rules/procedures that governs the way information is exchanged between Computers over the network is called

    A. Protocol
    B. Command
    C. Syntax
    D. Algorithm
    E. Program

22. Which of the following is NOT a benefit of network?

    A. Duplication of data on files of different Computers on the network
    B. Sharing of programs and data
    C. Better communications
    D. Security of Information
    E. Access to databases

23. OSI means

   A. Open System Interconnection
   B. Open System Internet
   C. Open Source Internet
   D. Open Source Interconnection
   E. Open Source Input

24. Which of the following is NOT an Internet Security issue?

   A. Sharing of peripheral devices
   B. Communication link may break down or distort data
   C. Information transmitted from one part of the organisation to another may be intercepted
   D. Employees may download inaccurate information, or imperfect or virus-ridden software from external networks
   E. A virus on a single Computer can easily spread through the network to all the organisation's Computers

25. Forensic investigation process does not involve the ---------- of digital evidence

   A. Identification
   B. Presentation
   C. Analysis
   D. Design
   E. Preservation

26. Which of the following does NOT include the running cost of a system?

   A. Staff salaries
   B. Training
   C. Maintenance
   D. Cost of installing the system
   E. Utilities and consumables

27. The steps involved in system investigation are

   A. Fact-finding and Evaluation
   B. Fact recording and Evaluation
   C. Fact-finding, Fact recording and Evaluation
   D. Fact finding and Fact recording
   E. Fact finding

28. The application of investigation and analysis techniques to gather and preserve evidence from a particular computing device in a way that is suitable for presentation in a court of law is

    A.   Telecommuting
    B.   Cloud Computing
    C.   Forensic Computing
    D.   Grid Computing
    E.   Detective Computing

29. Which of the following does NOT include Repetitive Strain Injuries?

    A.   Eye
    B.   Neck
    C.   Arm
    D.   Hand
    E.   Wrist

30. A Computer crime that uses psychological manipulations to trick users into making security mistakes or divulging confidential information is

    A.   Social engineering
    B.   Salami Technique
    C.   Hacking
    D.   Denial of service attack
    E.   Masquerading

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.   The logical components of a system are Input, Output and ……………………..

2.   A system which interacts with their environment for the collection of Information is known as ……………………..

3.   A System that contains built-in control mechanism for self-regulating is known as …………………..

4.   A printer that work by banging a head or needle against an ink ribbon to make a mark on the paper is called ………………………

5.   A program that converts the user's code into machine language code is known as ………………………..

6.   A finite sequence of instructions to solve a given problem is called …………………

7.   In a program flowchart symbol, the circle shaped box depicts …………………..

8.   A collection of related data files is known as …………………………………..

9.   Another name for machine code is ………………...

10.   The way data are stored on the physical storage media is known as …………..

11.   The amount of time taken to complete a process or fulfil a request is known as ………………...

12.   A procedure that a computer's CPU follows to change from one task to another while ensuring that the tasks do not conflict is called …………………...

13.   A technique that enables many people, located at various terminals, to use a particular Computer system at the same time on time slice basis is called……………...

14. A network in which all the PCs on the network communicate directly with each other and there is no server is called ………………………..

15. The technique of transforming information to make it unreadable for unauthorised users in order to preserve its confidentiality during transmission and when stored is called ………………..……....

16. The Seventh layer of OSI model is known as ……………………..

17. A communication equipment that performs the conversion of computer's digital signals to analog signals as well as analog signals to digital signals is called ………………………..

18. The process through which users or organisations send files and documents to the internet for authorised users to access is called …………………......

19. A protocol used by the World Wide Web that defines how messages are formatted and transmitted, and what actions web servers and browsers should take in response to various commands is called …………………......

20. An approach of changeover where the old system is discarded and replaced with the new system is known as ……………………

SECTION B: ATTEMPT ANY FOUR QUESTIONS   (50 Marks)

QUESTION 1

a.   Define
     i.   Quantitative Information   (1½ Marks)
     ii.   Qualitative Information   (1½ Marks)

b.   State THREE examples of Quantitative Information   (1½Marks)
C.   State FOUR benefits of Information Systems   (4 Marks)
d.   State FOUR challenges of Information Systems   (4 Marks)
                                                      (Total 12½ Marks)

QUESTION 2

a.   What is an Output device?   (2 Marks)
b.   Describe THREE features of Impact printers as an output device   (3 Marks)
c.   Identify and describe FIVE output devices   (7½ Marks)
                                                      (Total 12½ Marks)

QUESTION 3

a.   What is an application package?   (2½ Marks)
b.   Enumerate FIVE advantages of off-the-shelf application
     package over in-House packages   (5 Marks)
c.   Enumerate FIVE disadvantages of off-the-shelf application
     package over in-House packages   (5 Marks)
                                                      (Total 12½ Marks)

QUESTION 4

a.   Describe Real-time processing   (2½ Marks)
b.   State FIVE benefits of Real-time processing   (5 Marks)
c.   State FIVE challenges of Real-time processing   (5 Marks)
                                                      (Total 12½ Marks)

QUESTION 5

a.   What is Cloud computing?   (2 Marks)
b.   List and describe the THREE technologies used in Cloud computing
                                                      (10½ Marks)
                                                      (Total 12½ Marks)

QUESTION 6

a.   What is safety and security in a workplace?   (1 Mark)

b.   List and describe THREE health issues that can happen to a user
     of computer in a work place.   (9 Marks)

c.   Mention FIVE basic steps/techniques involved in Forensics
     Processes   (2½ Marks)
                                                      (Total 12½ Marks)

SECTION A: PART I   MULTIPLE CHOICE SOLUTIONS

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

28. C

29. A

30. A

EXAMINER'S COMMENTS

Thirty questions were set in this section and they spread across the whole syllabus. The questions tested students' knowledge and understanding of most of the aspect of the syllabus.

The performance is highly impressive as over 70% of the candidates scored above 60% of the allocated marks.

Candidates are advised to be more familiar with IT terms and concepts by using ICAN study packs and credible IT textbooks.

SOLUTION (SAQ)

1. Process/processing

2. Open system

3. Closed-loop control system

4. Impact printer/line printer

5. Language Processor/Language Translator

6. Algorithm

7. Connector

8. Database

9. Object code

10. File organisation

11. Turnaround time

12. Multi-tasking

13 Time-sharing

14. Peer-to-Peer

15. Data encryption/cryptography

16. Application

17. Modem (Modulator/Demodulator)

18. Uploading

19   HTTP (Hyper Text Transfer Protocol)

20. Direct changeover

EXAMINER'S COMMENTS

This section consists of twenty questions demanding for words or phrases as solutions. The questions cover almost all the sections of the syllabus, but the performance is very bad as about 60% of the candidates scored below 50% of the allocated marks.

The major pitfall of the candidates is the inability to supply correct words to the questions.

Candidates are advised to be more familiar with IT concepts by reading standard IT texts and ICAN study pack.

SECTION B THEORY SOLUTIONS

SOLUTION 1

1ai. Quantitative Information

This is an information that deals with the magnitudes of variables, their variability or absolute value. It can also be defined as the value of data in the form of counts or numbers where each data-set has a unique numerical value associated with it. It is usually collected for statistical analysis using surveys, polls or questionnaires sent across to a specific section of a population.

It is any quantifiable information that can be used for mathematical calculations and statistical analysis, such that real-life decisions can be made base on these mathematical derivations. It is used to answer questions such as "How many?", "How often?", "How much?". This information can be verified and can also be conveniently evaluated using mathematical techniques.

ii.   Qualitative Information

This is an information that is related to the attributes of an entity in respect of quality factors. This type of information is not exact in nature but it is very useful for comparative measurement.

Qualitative information describes qualities or characteristics. It is collected using questionnaires, interviews, or observation, and frequently appears in narrative form.

For example, it could be notes taken during a focus group on the quality of the food at restaurant or responses from an open-ended questionnaire. Qualitative information may be difficult to precisely measure and analyse. It could be in the form of descriptive words that can be examined for patterns or meaning, sometimes through the use of coding.

Qualitative information could also be standard of finished product in respect of paintwork, variation of tolerances of manufactured parts such as deviation from standard dimensions.

b.   Examples of Quantitative Information include:

i.   Annual sales of Production of a company
ii.   Variation in the wages of low-level staff in an organisation
iii.   Number of people who log-in within a specified period by checking the system log
iv.   Number of employees who report for work through the use of clocking machine
v.   Prices of goods
vi.   Number of hours worked on a production line
vii.   Number of people who download a particular application from the App Store.

c.   Benefits of information system include:

i.   Operational efficiency
ii.   Functional effectiveness
iii.   Provision of improved services
iv.   Better products selection
v.   Competitive advantage
vi.   Reduction in the rate of error
vii.   It enhances faster processing
viii.   It enhances paperless office

ix. Increase in productivity

x. Savings in labour

xi. It reduces storage space of files since files can be stored in electronic form rather than hard copies in cabinets.

xii. Better customer services

xiii. Complete and recent information

d. Challenges of information system include:

i. Loss of valuable data due to virus infection, and end users mistakes or deliberate action by the user

ii. Users activities will be system dependent, therefore if the system breaks down, activities of the user will be affected

iii. Unauthorized access due to hacking or eavesdropping to enhance the fraudulent activities of fraudsters

iv. GIGO phenomenon (Garbage-in Garbage-out) which means whatever you feed into a system will be processed by the system. Therefore, if wrong data is fed into the system wrong information will be produced

v. Users may be prone to some health hazard such as eye strain, finger strain, wrist pain and general tiredness

vi. Information produced and not well understood or explained can lead to wrong use

vii. It can lead to staff redundancy

viii. Ease of fraud

ix. The use of information system requires some level of computer literacy

x. High cost of acquisition

xi. High cost of maintenance

EXAMINER'S COMMENTS

This question tests candidates' knowledge in Information Systems. It demands for the nature of quantitative and qualitative information as well as the benefits and challenges of Information Systems.

About 80% of the candidates attempted this question and the performance is fair as about 60% of the candidates scored over 60% of the allocated marks.
The major pitfall is that candidates could not distinguish between quantitative and qualitative information.

Information system is a major component of the syllabus so candidates need to pay more attention to it for future examinations.

SOLUTION 2

2a.   Output devices are devices that bring out computer output or information from the central processing unit to the outside world such as monitor, printer, speaker.

      OR: It is any piece of computer hardware equipment that gives information out from a computer system.

b.   Features of impact printers as an output device are:

      i.   It is old technology
      ii.   It makes noise when printing
      iii.   It cannot print a page at a time
      iv.   It does not have good quality print out
      v.   It is very slow
      vi.   It uses ink ribbon
      vii.   It is relevant for printing multiple copies (i.e carbon copies)
      viii. It is useful for bulk copies because of its low cost of operation

c.   Examples of output devices are:

      i.   Monitor or Visual Display Unit (VDU)
      ii.   Printer
      iii.   Speaker
      iv.   Projector

v. Graph plotter
vi. Computer output on Microform (COM)
vii. Headphone
viii. Voice Response (Audio Response Unit)

Explanations:

i. Monitor:
This is a device that displays computer output on its screen (sometimes in colours) in the form of text, graph, diagram or picture. The Visual Display Unit output is called softcopy output and is only suitable for data of temporary use.

Types of Monitor:
- Monochrome Monitor: It displays information in black and white colour
- Colour Monitor: It displays information in different colours
- Liquid Crystal Display Monitor

ii. Printer:
A printer is an output device that produces computer output on paper known as hardcopy output. The output produced on paper is the most usual form of output.

Printers can be classified into two categories:

i. Impact printer
ii. Non-impact printers

Examples of printer are:

- Line printer
- Daisy wheel printer
- Dot matrix printer
- Thermal printer
- Electrostatic printer
- Inkjet printer
- Xerographers
- Lasers printers etc.

iii. Speakers
These are hardware devices that transform the signal from the computer's sound card into audio. Speakers create sound using internal amplifiers that vibrate at different frequencies according to data from the computer. This produces sound.

iv. Projector
As its name suggests, this output device projects computer images or video unto a wall or screen. The computer transmits the image data to its video card, which then sends the video image to the projector. It is most often used for presentations or for viewing videos.

v. Graph Plotter
This is a device used for the output of graphical information on large and small computers. The most common type is the drum plotter. Continuous paper lies over the surface of the drum with the pen in a cradle that will move auxiliary with respect to the drum.

vi. Computer Output on Microform (COM)
Computer Output on Microform is a form of computer output whereby, the output is projected on to a cathode ray tube and photographed into a very much reduced form i.e, into a microform. Microform is readable but it requires a magnifying reading device or photographic development before it can be viewed.

There are two types of a Microform:

- Microfilm: This is an ordinary roll of film i.e, a continuous strip with images formed in frames one at a time, along the strip of the film.

- Microfiche: It is a separate sheet of film containing a rectangular pattern of pages. Special viewers are available to magnify a page at a time up to readable size.

Normal printout can simply be photographed on the microfilm or microfiche but there are special COM units using cathode – ray tubes or light-emitting diodes and providing film or fiche output direct, requiring only photographic development.

vii. Headphone
It allows the users to listen to audio without disrupting other people in the vicinity

viii. Voice Response (Audio Response Unit)
       A voice response system is also known as an audit response unit or a voice
       answer back machine and is one of the least familiar peripheral. It has a
       restricted vocabulary of fixed words that are produced as audio output to sound
       like a human voice.

EXAMINER'S COMMENTS

This question tests candidates' knowledge and understanding on computer output
devices. It demands for the features of impact printers as well as some examples of
output devices.

This question is very popular among the candidates as over 70% of the candidates
attempted this question.

The performance is good as over 70% of the candidates scored over 60% of the
allocated marks.

SOLUTION 3

3a. Application packages

     An application package is a software that consists of programs which are
     written to solve specific user's problems. It consists of programs which direct
     the computer system to solve specific data processing activities required for the
     solution of business and other problems of the computer user. It is designed for
     user's immediate use and supports users. It can also be defined as a pre-written
     computer program that are widely used for specific applications in order to
     avoid unnecessary duplication of similar programs by many users.

b.   Advantages of off-the-shelf application packages over in-house packages:

     i.   It enables faster implementation of the computer system compared to in-
           house packages.
     ii.   It reduces errors in design since the packages would have been properly
           tested by various users before sales as against in-house packages that
           can only be tested by the user alone.
     iii. It provides software expertise not normally available to common users.

iv.   It reduces cost since the cost of developing the package would have been spread across many buyers as against in-house packages that the cost will be incurred by the users alone.

v.   The user does not have the potential burden of computer staff to contend with; as packages are suited to be operated by non-computer personnel.

vi.   It is less expensive compared to in-house packages.

vii. It is usually error free and well suited to the general public.

viii. It is constantly updated by the developer.

ix.   It is written by software specialists and has a very high quality.

x.   It can be used immediately by the user after purchase because it must have been properly tested by the developer.

xi.   It is long in the market

xii. It is well documented with ease to follow users' manual.

c.   **Disadvantages of Application Packages**

i.   The user will have less control over the quality of works and services than they would have over programs produces by their own employees.

ii.   The user is dependent on the supplier of the package for maintenance of the system as against the in-house packages that easily be maintained by the user or developer who is resident in the organisation.

iii. There is the likelihood of inefficiency resulting from the inclusion of features not relevant to every application but the features in in-house packages will be limited to user's needs.

iv.   Off-the-shelf application packages cannot be customized unlike in-house developed packages that can easily be customised because it is 'tailor-made'.

v.   It produces standardized solution which may be well suited to individual user.

vi.   It may not have some special features required by the end user.

vii. Sometimes, the off-the-shelf packages may not be compatible with the hardware or data structure of the organisation.

viii. The developer will be more attached to the software therefore the user will depend on the manufacturer for maintenance and update.

ix.   The source code of off-the-shelf packages is not with the user therefore it can only be upgraded by the developer

x.   Customization of off-the-shelf may be problematic.

xi.   The off-the-shelf may demand for high memory capacity which may be very expensive to an Organisation.

xii.   It may not have some special features requires by the end-user.

EXAMINER'S COMMENTS

This question tests candidates understanding of application packages. It demands for the advantages and disadvantages of off-the-shelf packages over In-house packages.

This question is very popular among the candidates as over 80% of the candidates attempted it.

The performance is good as over 75% of the candidates scored over 65% of the allocated marks.

SOLUTION 4

4a.   Real-time Processing:
Real-time processing is a processing method whereby data can be entered into a system, all the data will be accepted, processed and all relevant files updated and the result will be produced immediately because the result will be needed to take further action.

In real-time processing, data are captures electronically, edits for accuracy and completeness, process it instantly and produces result. Output from real-time processing is generated immediately so that it can be used to influence the current activities.

b.   Benefits of Real-time processing are:

i.   Result is made available immediately
ii.   It enhances paperless transaction
iii.   In real-time processing, several databases can be updated and updated concurrently.
iv.   It enables users to see the cumulative effect of all transactions for decision making.

v.   It avoid costly and time consuming data preparation and control
vi.   It is interactive
vii. It enhances quick decision making due to immediate result from the system.

c.   Challenges of Real-Time processing are:

i.   It is very complex to design and implement
ii.   Processing activities will be network dependent
iii.   It is prone to security challenges such as hacking, eavesdropping
iv.   There is no enough time to adequately check input data for error
v.   Organisations with critical real-time applications have to pay a high cost premium for the security of fault tolerant computer system
vi.   It is expensive to implement.
vii.   Users may be prone to some ergonomic risk factors such as eye strain
viii. Implementation of real-time processing requires a lot of expertise.

EXAMINER'S COMMENTS

This question tests candidates' understanding of processing techniques. It demands for the advantages and disadvantages of Real-time processing technique.

Over 50% of the candidates answered this question and the performance was just fair. About 40% of the candidates scored over 50% of the allocated mark.

The major pitfall was that many of the candidates do not have a clear understanding of Real-time processing.

Processing technique is a major component of the syllabus, so candidates are advised to pay more attention to it.

SOLUTION 5

5a.   Cloud Computing

Cloud computing can be defined as internet-based computing whereby shared resources, software and information are provided to computers and other devices on demand like the electricity grid.

It describes a new supplement, consumption and delivery model for information technology services based on the web-based tools or applications that users can access and use through a web browser as if it were a program installed on their own computer.

Cloud computing is a system in which applications and services run on a distributed network using virtualized resources and accessed by common internet protocols and networking standard.

It can also be described as a trend in information technology that moves computing resources and data away from the user's desktop and personal computers into a large data center.

It is a web-based technology where quality services are provided to users including data and software, on remote servers.

5b.   Technologies used in Cloud Computing are:

i.   Infrastructure–as–a–Service (IaaS)
ii.   Platform-as-a–Service (PaaS)
iii.   Software-as-a-Service (SaaS)

i.   Infrastructure-as-a-Service (IaaS): The backbone of the entire concept; the vendors provide the physical storage space and processing capabilities that allow for all the services described above. Major infrastructure vendors are:

- Google - managed hosting, development environment
- International Business Machine (IBM) - managed hosting
- Terremark - managed hosting
- Amazon.com - cloud storage
- Backspace Hosting - managed hosting and cloud computing.

ii.   Platform-as-a-Service (PaaS): The platform segment of cloud computing refers to products that are used to deploy applications. Platforms servers as an interface for users to access applications provided by partners or in some cases the customers. Examples of platforms are salesforce.com platform, Netsuite, Amazon, Google, Sun Oracle, Microsoft etc.

iii.   Software-as-a-Service (SaaS): In the past, the end-user would generally purchase a license from the software provider and then install and run the software directly from on-premise servers. Using on-demand service,

the end-user pays the software a subscription fee for the service. The software is hosted directly from the software provider servers and is accessed by the end-user over the internet. Some of the companies that offers SaaS business include: Sales force.com, Google, Netsuite, Info Technologies, Canada software.net.

EXAMINER'S COMMENTS

This question tests candidates' knowledge on cloud computing. It demands for the definition and the technologies used in cloud computing. Only few candidates attempted this question and the performance was poor.

The major pitfall was that many candidates could not mention nor describe the technologies.

Cloud computing is a modern computing techniques and candidates are advised to pay more attention to it for future examinations.

SOLUTION 6

6a.   Safety and security in workplace

This is a set of measures put in place to protect an employee from work related illness and injury and to make the workplace safe, secure and conducive for employees.

Safe and secure working environment can be provided by using thorough security system including access control systems, CCTVs (Closed Circuit Television), keycards, clean environment, emergency exits, training the employees about security procedures, constant improvement of the system as well as using security guards to physically guarding the entire work place.

b.   Health issues that can happen to a user of computer in a work place are:

i.   Eye strain
ii.   Back pain
iii.   Finger strain and wrist pain
iv.   Repetitive Stress Injury (RSI)
v.   Obesity

vi.   Photosensitive epileptic seizures (caused by flashing or rapidly changing lights).

EXPLANATIONS:

i.   Eye strain:
Focusing eyes at the same distance point for long periods of time causes eye problem. The human eye structurally prefers to look at objects more than six metres away, so any work performed close up puts extra demands on your eye muscles.

The illuminated computer screen can also cause eye fatique therefore, computer users may get symptoms such as blurred vision, temporary inability to focus on faraway objects and headaches.

ii.   Back pain:
Improper use of furniture and use of chair without back rest can cause back pain which may result to miscarriage in pregnant women. User must constitute the habit of using proper furniture with back rest.

iii.   Finger strain and wrist pain:
Improper positioning of keyboard and using inability to rest the wrist on the table when using the keyboard may lead to finger strain as well as wrist pain.

iv.   Repetitive Stress Injury (RSI):
This consists of wrist, hand, arm and neck injury resulting when muscles are forced through fast and repetitive motion. Repetitive stress injury can as well lead to damage to the nerves and tendons in the hands.

v.   Obesity:
This is a state of being grossly fat or overweight due to prolong sitting when using the computer system. Prolong use of the system will prevent the user from doing regular exercise which may lead to obesity. To prevent this, regular exercise is required to burn the excess fat.

c.   The following are basic steps involved in forensic processes:

i.   Preparation of investigation
ii.   Collection of the data
iii.   Examination of data
iv.   Analysis of data
v.   Reporting

EXAMINER'S COMMENTS

This question tests candidates' knowledge on safety and security in a work places as well as steps involved in forensic processes.

This question is not popular among the candidates as less than 40% of the candidates attempted it. The performance was very poor. The major pitfall is that the candidates do not have ideas about the question.