No. of Questions	Part-I	20
	Part-II	03
No. of Pages	Part-I	04
	Part-II	04

University of Vavuniya, Sri Lanka
Second Examination in Information Communication Technology - 2021
Second Semester - December/January – 2023/2024
TICT 2263 (T) - Accounting for Technology (Theory)

Answer all questions. **Time: Two (02) Hours for both. Parts**

PART - II

Q1. Trial Balance of the BlueLine PLC as at 31st March 2023 is as follows;

Description	**Dr (Rs.)**	**Cr. (Rs.)**
Stated Capital (100,000 Ordinary Shares)		10,000,000
Retained Earnings		950,000
Sales		12,500,000
Inventory as at 01st of April 2022	720,000	
Purchases	5,600,000	
Property Plant Equipment (PPE) at cost;		
Land and Buildings (Land value – 2 Million)	5,000,000	
Machinery	2,000,000	
Motor Vehicles	4,000,000	
Trade Debtors	1,160 000	
Trade Creditors		850,000
Bank Loan for 5 Years at 12%		2,500,000
Accumulated Depreciation as at 01st of April 2022		
Buildings		1 500 000
Machinery		1,200,000
Motor Vehicles		1,800,000
Fixed Deposits (05 Years term)	3,500,000	
Rent	100,000	
Stationary expenses Expenses	720,000	
Electricity expenses	800,000	
Insurance charges	450,000	
Salaries to the sales personnel	950,000	
Other selling expenses	650,000	
Income Tax paid	450,000	
Cash and Bank	5,200,000	
	31,300,000	**31,300,000**

Cost of sales = opening stock + purchases - closing stock

external - Financial
management - inter

Gross profit = sales - cost of sales

The following additional information is relevant:

a. The cost of inventory as at 31st March 2023 was 350,000. The Net Realizable Value (NRV) of the inventory as at 31st March 2023 was Rs.300,000.

b. As at 31st March 2023, the company has revalued its land in the first time to Rs. 2,500,000 and it was not recorded in the books of accounts.

c. The Property, Plant, and Equipment are to be depreciated on straight-line basis at cost. The useful life of the assets is as follows:

Building	: 50 years
Machinery	: 08 years
Motor vehicles	: 05 years

d. The accrued and prepayment expenses for the year ended 31st March 2023 are as follows;
   - Company has agreed to pay the monthly rental for Rs.10,000.
   - Prepaid Electricity - Rs.30,000

e. A 10% annual interest rate is applicable for the fixed deposit. This payment has not yet been received by the company.

f. The interest for the bank loan for the year ended 31st March 2023 has been accrued.

g. The company recovery unit confirmed that Rs.75,000 might be the bad debt allowance as at 31st March 2023.

h. The financial statements were authorized for issue by the Board of Directors on 31st of May 2023.

You are required to prepare the following, for BlueLine PLC in a form suitable for publication:

i. Statement of Profit or Loss and Other Comprehensive Income for the year ended 31st March 2023. (18 Marks)

ii. Statement of Financial Position as at 31st March 2023. (12 Marks)

iii. Note to the Financial Statements showing the movement of Property, Plant, and Equipment for the year ended 31st March 2023. (05 Marks)

(Total 35 Marks)

Q2.

(i) List out the components of a complete set of financial statements as per the LKAS 01: Presentation of Financial Statements. (05 Marks)

(ii) Explain how the accounting information helps businesses be accountable for its interested parties. (10 Marks)

(iii) "Currently, the accounting process evolved with computer based technological system in the business world."
Do you agree with this statement? If so, explain. (10 Marks)

(Total 25 Marks)

Q3.

A) The extraction of the Financial Statements of Green PLC for the year ended 31st March 2023 are given below:

Statements of Financial Position as at 31st March,

(Rs.' 000s)

	2023	2022
Assets		
Non-Current Assets		
Property, Plant and Equipment	88,000	68,000
	88,000	68,000
Current Assets		
Inventories	32,600	25,000
Accounts Receivables	8,000	5,600
Cash and Cash Equivalents	10,000	14,600
	50,600	45,200
Total Assets	**138,600**	**113,200**
Equity and Liabilities		
Equity		
Stated Capital of Rs.100 each	60,000	60,000
Retained Earnings	34,600	20,600
	94,600	80,600
Non-Current Liabilities		
Bank loans (05 Years)	28,000	20,000
	28,000	20,000
Current Liabilities		
Accounts Payables	16,000	12,600
	16,000	12,600
Total Equity and Liabilities	**138,600**	**113,200**

Statement of Profit or Loss and other Comprehensive Income for the year ended 31st March, 2023	(Rs. '000s)
Sales	48,000
Cost of sales	(20,000)
Gross Profit	28,000
Distribution cost	(3,600)
Administrative Expenses	(6,000)
Finance Cost	(2,400)
Profit before Tax	16,000
Income Tax Expense	(2,000)
Profit for the period	14,000

The following additional information is also provided:

(1) The number of ordinary shares outstanding on 31st March 2023 was 600, 000.

(2) The company operates 365 days a year.

You are required to calculate <u>any six (06)</u> accounting ratios for the year of 2023.

(12 Marks)

B) Discuss the importance of financial statements' ratio analysis for the business organizations.

(08 Marks)

(Total 20 Marks)

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University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology-2021

Second semester- December/January-2023/2024

TICT 2263(P) – Accounting for Technology (Practical)

Time- Two (02) hours

Instructions to Candidates:

- The question paper consists one **(01)** question in six **(06)** pages.
- Answer **all** Questions.
- Save all your documents in the "Z" drive with your index number on your computer.
- Use of a non-programmable calculator is permitted.
- Use of USB drives is strictly prohibited.

Question No.1

Gunarathna is one of the leading sole proprietors having retail outlets operating in Sri Lanka, especially in Jaffna, Matale, Colombo, and Kandy. The following information was extracted from the books of Gunarathna for the year ended 31st March 2023:

Business Name	: Gunarathna Sole Proprietorship
Mailing Name	: Guna Sole Proprietorship
Main Location (address):	No- 56, Cumaratunga Munidasa Mawatha, Colombo 03.
Pin code	: 00300
Email	: guna@gmail.com
Telephone No.	: 0112527050
Mobile No.	: 0778234542
Fax	: 0112354645
Operating Currency	: Sri Lankan Rupees (Rs.)

Gunarathna sole proprietorship's Trial Balance as at 31st March 2023.

Description	Dr. (Rs.)	Cr. (Rs.)
Capital		3,600,000
Property, Plant and Equipment at Cost:		
Land & Building (Land - Rs.1,250,000)	7,500,000	
Motor Vehicles	900,000	
Computers	805,000	
Furniture	425,000	
Accumulated Depreciation as at 1st April 2022:		
Building		1,600,000
Motor Vehicles		310,000
Computer		180,000
Furniture		75,500
18% Bank Loan (NSB)		1,800,000
Wages	12,000	
Telephone charges	38,700	
Electricity	112,000	
Bank A/C – Bank of Ceylon	7,450,850	
Postal charges	25,500	
Advertising	15,000	
Investments	500,000	
Drawings	35,000	
Sales		22,976,150
Purchase	12,000,000	
Purchase return		655,000
Sales return	1,200,000	
Insurance	388,000	
Commission Income		325,000
Cash	1,350,250	
Fixed deposit at Commercial Bank at 20%	1,850,000	
Sundry Debtors- Delmon Traders	2,100,000	
Thilanka stores	900,350	
Aswin PLC	350,000	
Sundry Creditors- Kajamuga Stores		5,750,000
Farwin Stores		1,800,000
Klinton Pvt Ltd.		275,000
Rent	150,000	

Indirect expenses, Depre
Current liabilities

CY

Stock as at 01.04.2022							
Stock Group	**Stock item**	**No. of. quantity**	**Cost per unit (Rs)**	**Godowns**	**Quantity**		
Chocolates	Dairy Milk	250 Boxes	2,000	Jaffna	50 Boxes	500,000	
				Kandy	100 Boxes		
				Colombo	100 Boxes		
	Toblerone	120 Boxes	1,200	Matale	25 Boxes	144,000	
				Jaffna	15 Boxes		
				Colombo	60 Boxes		
				Kandy	20 Boxes		
	Kandos	200 Boxes	500	Jaffna	100 Boxes	100,000	
				Kandy	50 Boxes		
				Colombo	50 Boxes		
Grocery	Sugar	600 Kg	200	Kandy	150 Kg	120,000	
				Jaffna	200 Kg		
				Matale	120 Kg		
				Colombo	130 Kg		
	Chilli powder	250 Kg	1,500	Jaffna	120 Kg	375,000	
				Colombo	70 Kg		
				Kandy	30 Kg		
				Matale	30 Kg		
						39,346,650	**39,346,650**

The following additional information is available at Gunarathna sole proprietorship for the year ended 31st March 2023:

1. Gunarathna has brought Rs. 1,500,000 to the business as additional capital on 05th April 2022.
2. Gunarathna depreciates its Property, Plant, and Equipment on the following basis.

	Rate	Method
Buildings	2%	Straight line method
Motor vehicle	20%	Straight line method
Computers	10%	Straight line method
Furniture	15%	Reducing balance method

3. Rs. 250,000 has been withdrawn from the Bank of Ceylon.

4. The Purchase order made to Kajamuga Stores (Purchase order No – KS 01) is tabulated below.

Items	Godowns	No. of quantity	Quantity	Unit Price (Rs.)
Sugar	Kandy	250 Kg	50 Kg	220
	Jaffna		120 Kg	
	Matale		50 Kg	
	Colombo		30Kg	
Wheat flour	Jaffna	200 Kg	100 Kg	400
	Matale		20 Kg	
	Kandy		80 Kg	
Chilli Powder	Jaffna	700 Kg	250 Kg	1600
	Colombo		350 Kg	
	Kandy		100 Kg	

5. The Purchase invoice raised for Purchase order No – KS 01(for all items)

Journal

Purchase D

6. A Delivery van has been purchased on 01st January 2023 and has to be depreciated at 20 % on a straight-line basis. ~~10,000~~ Rs 10,000,000

dep

7. The following accruals are yet to be accounted for the period:

Accumulate

Machinery repairs	Rs. 26,000
Wages	Rs. 8,500
Rent	Rs.2,500

10,000,000

~~Debit note~~ purchase.

8. The following items have been purchased from Farwin Stores (Purchase Invoice No – FS 02):

Stock Group	Items	Godowns	No. of quantity	Quantity	Unit Price (Rs.)
Cooking Oil	Sunflower Oil	Jaffna	500 L	150 L	300
		Colombo		200 L	
		Kandy		50 L	
		Matale		100 L	
	Vegetable Oil	Jaffna	250 L	100 L	350
		Kandy		30 L	
		Colombo		120 L	
	Coconut Oil	Jaffna	300 L	100 L	280
		Colombo		20 L	
		Kandy		80 L	
		Matale		100 L	

10. The following items were returned to Kajamuga Stores (KS 01):

Purchase account

~~Debit note~~

Debit

Dr Delivery van depreciation
Accumulated delivery van

Items	Godowns	No. of quantity	Quantity	Unit Price (Rs.)
Sugar	Kandy	46 Kg	10 Kg	220
	Jaffna		20 Kg	
	Matale		05 Kg	
	Colombo		11 Kg	
Wheat flour	Jaffna	36 Kg	24 Kg	400
	Matale		02 Kg	
	Kandy		10 Kg	
Chilli Powder	Jaffna	225 Kg	100 Kg	1,600
	Colombo		100 Kg	
	Kandy		25 Kg	

11. The following items were ordered from Delmon Traders (sales order No. DT 04): sales order

Items	Godowns	No. of quantity	Quantity	Unit Price (Rs.)
Sugar	Kandy	430 Kg	100 Kg	230
	Jaffna		150Kg	
	Matale		100 Kg	
	Colombo		80 Kg	
Wheat flour	Jaffna	100 Kg	60 Kg	410
	Kandy		40 Kg	
Sunflower oil	Jaffna	370 L	120 L	320
	Colombo		200 L	
	Kandy		30 L	
	Matale		20 L	

12. The Sales invoice was raised for sales order No (DT 04). Sales

13. The following items were returned from Delmon Traders (DT 06): ~~Sales~~ Credit note

Items	Godowns	No. of quantity	Quantity	Unit Price (Rs.)
Sugar	Kandy	50 Kg	10 Kg	230
	Jaffna		15Kg	
	Matale		10 Kg	
	Colombo		15 Kg	
Wheat flour	Jaffna	15 Kg	10 Kg	410
	Kandy		05 Kg	

14. Fixed deposit interest income has been received by cash during the year.

Fixed - 20 1850,000 × 20/100

370000

15. Gunarathna had settled 70 % of the net purchase made from Kajamuga stores during the financial year.

With reference to the TallyPrime Accounting package, you are required to generate the following of Gunarathna sole proprietorships for the financial year ended 31st March 2023.

1. Sole Proprietorship creation

(05 Marks)

2. Trail Balance as at 31st March 2023.

(15 Marks)

3. Day Books for the year ended 31st March 2023.

(60 Marks)

4. Statement of Profit or Loss Account for the year ended 31st March 2023.

(10 Marks)

5. Statement of Financial Position as at 31st March 2023.

(10 Marks)

(Total 100 Marks)

5 7 50,000 + 12,55000 - 384520

purchase

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University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January 2023/2024

TICT2244: Computer Graphics (Theorey)

- ⊙ Answer **four questions** only.
- ⊙ This paper has **five questions** on **two pages**.
- ⊙ Time allowed: **Two Hours**.
- ⊙ Start answering question on a new page.

1. (a) Distinguish between pixel ratio and aspect ratio. [20%]

   (b) Describe the term "Cathode Ray Tube (CRT)". List five benefits and three drawbacks. [20%]

   (c) Write procedure to fill polygon using Flood fill. [40%]

   (d) Consider two raster systems with resolutions of 640×480 and 1280×1024. How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second? [20%]

2. (a) List three line drawing algorithm in the computer graphics. [10%]

   (b) Find the line equation using the Digital Differential Analyzer (DDA) line algorithm to draw a straight line between given two end points (X_a, Y_a) and (X_b, Y_b) for each of the following slope conditions: [30%]

      i. Slope $|m| < 1$

      ii. Slope $|m| = 1$

      iii. Slope $|m| > 1$

   (c) Briefly describe the steps in the DDA algorithm to draw a straight line. [20%]

   (d) Calculate at least 9 points between the starting point `(1, 7)` and ending point `(11, 17)` using DDA line algorithm. [40%]

3. (a) Briefly describe the eight octant coordinates system of the circle drawing algorithm. [10%]

   (b) Suppose the current point is (X_k, Y_k) and the next point is (X_{k+1}, Y_{k+1}). Find the next point of the first octant depending on the value of decision parameter P_k. (using Bresenham) [20%]

   (c) Write an algorithm to represent the Bresenham's circle drawing algorithm. [30%]

   (d) Given the centre point coordinates as (0, 0) and radius as 8, generate all the points to form a circle using Bresenham's circle drawing algorithm. [40%]

4. (a) What is Transformation in the context of computer graphics? [10%]

(b) Give the matrix form of translation, scaling and rotation. [30%]

(c) Explain the term "composite transformation" in the context of computer graphics. [10%]

(d) Translate the triangle with co-ordinates A(2,5),B(7,10) and C(10,2) by 3 units in x direction and 4 units in y direction. [20%]

(e) Given a line segment with starting point as (0, 0) and ending point as (4, 4). Apply 30 degree rotation anticlockwise direction on the line segment based on the starting point (0, 0) and find out the new coordinates of the line. [30%]

5. (a) Briefly explain the term "reflection" in the context of computer graphics? [10%]

(b) Give five advantages of reflection in computer graphics. [10%]

(c) Give the matrix going to be used in the following types of reflection: [40%]

i. Reflection about the x-axis

ii. Reflection about the y-axis

iii. Reflection about an axis perpendicular to xy plane and passing through the origin

iv. Reflection about line $y = x$

(d) Obtain the mirror reflection of the triangle formed by the vertices A(0, 3), B(2, 0) and C(3, 2) about each of the following cases: [40%]

i. x-axis,

ii. y-axis,

iii. an axis perpendicular to xy plane and passing through the origin, and

iv. line $y = x$.

No of Pages	02
No of Questions	08

UNIVERSITY OF VAVUNIYA

FACULTY OF TECHNOLOGICAL STUDIES

SECOND EXAMINATION IN TECHNOLOGICAL STUDIES –2020/2021

SECOND SEMESTER -NOV/DEC 2023

AUX 2213 -COMMUNICATION AND SOFT SKILLS

Index No: TS 5051

Time: 2 hours

Communication Skills

Exchange the ideas ~~between~~ with others through Verbal or nonverbal means.

Part I

Q1. **Write short notes on the following topics (Each topic should consist of at least five points with suitable examples)** *(25 minutes)*

a) Horizontal and Vertical Communication

b) Inter-personal and Intra-personal Communication — between one or two people; between one or one self and one self

c) Verbal and Non-Verbal Communication

d) Upward and Downward Communication

e) One-way and two-way Communication

(04×5 = 20 marks)

Q2. **Describe the patterns of communication with suitable examples.** *(20 minutes)*

a) Y- shape Communication

b) Star Communication

c) Line Communication

d) Circle Communication

(05× 4= 20 marks)

Part II

❖ **Answer any TWO questions from Q3-6.**

Q3. Describe the important features of **negotiation skills and how they help you** achieve your targets. *(15 minutes)*

(15 marks)

Q4. Describe **barriers to communication** skills with suitable examples. *(15 minutes)*

(15 marks)

Q5. **Motivation** plays a major role in professional development. Discuss types of motivation with suitable examples. *(15minutes)*

(15 marks)

Q6. Illustrate the 7Cs of communication with suitable examples. *(15 minutes)*

(15 marks)

1 Correctness
2 Completeness
3 conciseness
4 Courtesy
5 clarity
6 Consideration
7. Concreteness

Part III - Soft Skills

Q7. **A.** Briefly describe the following with suitable examples. *(15 minutes)*

a) **Time management** is an essential factor for personal and professional development.

b) **Interview techniques** are essential to succeed in an interview.

(05 × 2 =10 marks)

B. Answer any two questions. Understand the following situations and explain. *(15 minutes)*

a) Imagine you have been selected as the president of the university's student union. What **leadership skills** should you have to run the union successfully?

b) Imagine you have a work Visa to work abroad while you pursue your degree at the University of Vavuniya. What is your **decision**? Describe with suitable reasons. (**Decision-making skills**)

c) Many university students face many problems in their primary subjects as they have poor English language proficiency. As you are one of the university students, how can you overcome this problem? (**Problem-solving skills**)

(05× 2 =10 marks)

Q8. Differentiate **Soft Skills** from **Hard Skills** and describe the major elements of soft skills for a successful career. *(15 minutes)*

(10 marks)

University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December 2023

(End of Course Examination)

TICT2233: Database Management Systems (Practical)

- Answer **All questions.**
- This paper has **One questions** on **Six pages.**
- Time allowed: **Two Hours.**
- Create a folder named with your Index Number (TSXXXX) on the desktop and save all your text files and the screenshots of the output into the folder. **Two Hours.**
- Write your index number clearly in the first line of your text file.

1. Suppose that you are required to create a database named Vehicle_Parking with the following instances in tables such as Camera, Keeper, Image, Permit and Vehicle:

select name, address from keeper order by ASC

Keeper

ID	Name	Address
1	Ambiguous, Arthur	Absorption Ave.
2	Inconspicuous, Iain	Interception Rd.
3	Contiguous, Carol	Circumscription Close.
4	Strenuous, Sam	Surjection Street.
5	Assiduous, Annie	Attribution Alley.
6	Incongruous, Ingrid	Irresolution Pl.

primary Vehicle

ID	Permit
SO 02 MUP	Null
SO 02 NUP	Null
SO 02 OUP	Null
SO 02 PUP	Null
SO 02 QUP	Null

desc
ASC

Vehicle + Image + Keeper

[Question 1 continues on the next page]

Primary

Camera

ID	Keeper
1	IN
2	IN
3	IN
4	IN
5	IN
6	IN
7	IN
8	IN
9	OUT
10	OUT
11	OUT
12	OUT
13	OUT
14	OUT
15	OUT
16	OUT
17	Null
18	Null
19	Null

select Conn & CC.Cam.

select * from Image I join camera C on I.camera=C.ID where C.ID=10 and I.when=2007-02-26

Image

Camera	~~When~~ Date	Reg
1	2007-02-25 06:10:13	SO 02 ASP
17	2007-02-25 06:20:01	SO 02 ASP
18	2007-02-25 06:23:40	SO 02 ASP
4	2007-02-25 06:26:04	SO 02 ASP
17	2007-02-25 06:57:31	SO 02 CSP
17	2007-02-25 07:00:40	SO 02 CSP
12	2007-02-25 07:04:31	SO 02 CSP
5	2007-02-25 07:10:00	SO 02 GSP
16	2007-02-25 07:13:00	SO 02 GSP
2	2007-02-25 07:20:01	SO 02 TSP
19	2007-02-25 07:23:00	SO 02 TSP

[Question 1 continues on the next page]

19	2007-02-25 07:26:31	SO 02 TSP
19	2007-02-25 07:29:00	SO 02 TSP
8	2007-02-25 07:35:41	SO 02 CSP
18	2007-02-25 07:39:04	SO 02 CSP
18	2007-02-25 07:42:30	SO 02 CSP
10	2007-02-25 07:45:11	SO 02 CSP
8	2007-02-25 07:48:10	SO 02 CSP
19	2007-02-25 07:51:10	SO 02 CSP
18	2007-02-25 07:55:11	SO 02 CSP
11	2007-02-25 07:58:01	SO 02 CSP
18	2007-02-25 16:28:40	SO 02 SSP
9	2007-02-25 16:31:01	SO 02 SSP
18	2007-02-25 16:38:31	SO 02 RSP
9	2007-02-25 16:39:10	SO 02 RSP
9	2007-02-25 16:45:04	SO 02 HSP
9	2007-02-25 16:45:04	SO 02 HSP
9	2007-02-25 16:48:11	SO 02 HSP
9	2007-02-25 16:51:30	SO 02 HSP
9	2007-02-25 16:58:01	SO 02 ISP
12	2007-02-25 17:01:13	SO 02 ISP
3	2007-02-25 17:07:00	SO 02 JSP
18	2007-02-25 17:10:43	SO 02 JSP
19	2007-02-25 17:14:11	SO 02 JSP
3	2007-02-25 17:17:03	SO 02 JSP
10	2007-02-25 18:23:11	SO 02 MUP
11	2007-02-25 18:26:13	SO 02 NUP
12	2007-02-25 18:29:01	SO 02 OUP
3	2007-02-25 18:33:10	SO 02 PUP
15	2007-02-25 18:36:31	SO 02 PUP
3	2007-02-25 18:39:10	SO 02 PUP
10	2007-02-26 05:13:30	SO 02 TSP
18	2007-02-25 16:29:11	SO 02 DSP
19	2007-02-25 16:31:01	SO 02 DSP
19	2007-02-25 17:42:41	SO 02 DSP
9	2007-02-25 18:54:30	SO 02 DSP

[Question 1 continues on the next page]

3	2007-02-25 17:16:11	SO 02 ESP
10	2007-02-25 18:08:40	SO 02 ESP
11	2007-02-25 18:08:00	SO 02 FSP
12	2007-02-25 18:08:13	SO 02 GSP

Permit

Reg	sDate	ChargeType
SO 02 ASP	2006-01-21	Weekly
SO 02 ATP	2007-01-21	Daily
SO 02 ATP	2007-01-22	Daily
SO 02 BSP	2006-01-30	Weekly
SO 02 BTP	2006-01-30	Daily
SO 02 BTP	2006-01-31	Daily
SO 02 BTP	2007-02-03	Daily
SO 02 BTP	2007-02-04	Daily
SO 02 BTP	2007-02-05	Daily
SO 02 BTP	2007-02-06	Daily
SO 02 BTP	2007-02-07	Daily
SO 02 CSP	2007-01-21	Weekly
SO 02 CTP	2007-01-21	Daily
SO 02 CTP	2007-01-22	Daily
SO 02 DSP	2007-01-30	Weekly
SO 02 DTP	2007-01-30	Daily
SO 02 DTP	2007-01-31	Daily
SO 02 ESP	2007-02-21	Weekly
SO 02 ETP	2007-02-21	Daily
SO 02 ETP	2007-02-22	Daily
SO 02 FSP	2007-02-25	Weekly
SO 02 FTP	2007-02-25	Daily
SO 02 FTP	2007-02-26	Daily
SO 02 GSP	2007-02-28	Weekly
SO 02 GTP	2007-02-28	Daily
SO 02 GTP	2007-03-01	Daily
SO 02 HSP	2006-01-21	Monthly
SO 02 HTP	2006-01-21	Daily

[Question 1 continues on the next page]

select count(*) from camera where = 'in';

SO 02 HTP	2006-01-22	Daily
SO 02 ISP	2006-01-30	Monthly
SO 02 ITP	2006-01-30	Daily
SO 02 ITP	2006-01-31	Daily
SO 02 JSP	2007-01-21	Monthly
SO 02 JTP	2007-01-21	Daily
SO 02 JTP	2007-01-22	Daily
SO 02 KSP	2007-01-30	Monthly
SO 02 KTP	2007-01-30	Daily
SO 02 KTP	2007-01-31	Daily
SO 02 LSP	2007-02-21	Monthly
SO 02 MSP	2007-02-25	Monthly
SO 02 NSP	2007-02-28	Monthly
SO 02 OSP	2006-01-21	Monthly
SO 02 PSP	2006-01-30	Monthly
SO 02 QSP	2007-01-21	Annual
SO 02 RSP	2007-01-30	Annual
SO 02 SSP	2007-02-21	Annual
SO 02 TSP	2007-02-25	Annual

Image + camera.

image + Camera

select count(I.whn) from Image I inner join camera C on I.camera = C.ID where

select count(*) from Vehicle V ~~inner~~ join permit P on V.ID = P.Reg where sDate = '2007-01-30'

26
22
57

K.ID = I.camera
Join vehicle V on I.Reg = V.ID

Write SQL queries for each of the following questions based on the tables.

(a) Write queries to create database and create tables. [25%]

(b) Show the name and address of the keeper of vehicle "SO 02 PSP". [5%]

select K.name, K.address from keeper K inner Join Image i on K.ID = camera

(c) Show the number of cameras that take images for incoming vehicles. [5%]

(d) List the image details taken by Camera 10 after 26 Feb 2007. [5%] 6

(e) List the number of images taken by each camera. Your answer should show how many images have been taken by camera 1, camera 2 etc. The list must NOT include the images taken by camera 15, 16, 17, 18 and 19. [10%] 3

(f) List down the number of vehicles which has permits that start on 30th Jan 2007. [5%]

(g) List the name and address of each keeper in alphabetical order without duplication. [5%]

ASC

(h) List the owners (name and address) of Vehicles caught by camera 1 or 18 without duplication. [5%]

(i) Show the keeper's name and address who have more than 5 vehicles. [5%]

[Question 1 continues on the next page]

(j) Show the permit end date for each of the vehicles [*hint* : $DATE_ADD$ ('2010 − 05 − 11', $INTERVAL$ 1 DAY)] [10%]

(k) Obtain a list of every vehicle passing camera 10 on 25th Feb 2007. Show the time, the registration, and the name of the keeper if available. [10%]

(l) List the keepers who have more than 4 vehicles and one of them must have more than 2 permits. The list should include the names and the number of vehicles. [10%]

End

University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January 2023/2024

TICT2233(T): Database Management Systems (Theory)

- Answer **four questions** only.
- This paper has **five questions** on **four pages**.
- Time allowed: **Two Hours**.
- Answer a new question on a new page.

1. This scenario is regarding the student visa application. A student visa applicant is required to submit the details such as NIC, Full Name, Mobile Number, Email Address to create the login for visa application portal. Once they successfully create the login, they can upload their documents and apply for a course in any foreign universities. If the applicant got selected and receives an offer letter from the university,he/she will be eligible to apply for the student visa. If their student visa application gets rejected for a course,they can apply for another course using the same login.However,they cannot apply for the same course using the same login within a period of one year from the date of visa rejection.

   Answer the following questions based on the above scenario:

   (a) List down the Raw Data that you found in the scenario. [10%]

   (b) Briefly explain the terms information and explain the data, information, and processing using the given scenario. [10%]

   (c) Identify a knowledge you discovered from the above scenario. [5%]

   (d) List down the super keys.(Assume NIC and Email Address are unique) [15%]

   (e) List down five key responsibilities of a Database Administrator(DBA). [10%]

   (f) Define the term meta data with suitable example of this Database. [5%]

   (g) Enumerate the components of a DBMS with suitable diagram. [15%]

   (h) Explain the five importance of a good database design. [20%]

   (i) Define what is meant by the term "Big Data" and discuss how it differs from the traditional data. [10%]

2. (a) In a library management system, books have an ISBN (International Standard Book Number), which is specific to each book. The combination of "Title," "Author," and "Publication Year" may also help distinguish a book from others.unique keys might be the ISBN or the combination of the title, author, and year of publication. Answer the following questions based on the above scenarios:

   i. Identify all the possible super keys. [15%]

   ii. List down the candidate keys. [15%]

   iii. If ISBN was selected as a primary key, mention the alternate keys. [10%]

   (b) Briefly explain the islands of information in the context of DBMS. [10%]

   (c) Write short note on each of the following:

   i. Single Database - single user at one time

   ii. Workgroup Database

   iii. Cloud Database - It is cloud computing.

   iv. Operational Database

   v. Analytical Database - A typically [50%]

3. (a) List down seven types of keys used in Database Management System(DBMS). [10%]

Primary
foreign
unique
Alternate

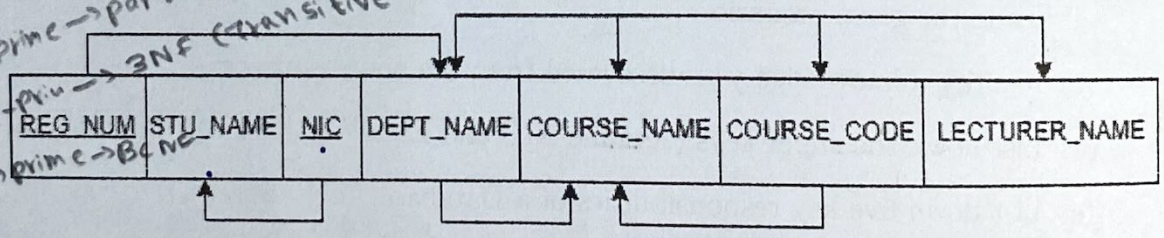
   (b) State what is meant by the term functional dependency using a real world example. [10%]

   (c) Draw a real world relational database with suitable diagram which clearly express the Boyce Codd Normal Form. [15%]

   (d) Answer the following questions using the given dependency diagram for a relation R:

   R:

Prime -> Non prime -> partial (2NF)
Non prime -> non prime -> 3NF (transitive
Non prime -> prime -> BCNF



   i. Identify the possible dependencies and discuss each of them. [20%]

   ii. Normalise the above relation R into 2NF, showing the dependency diagrams for each table. [15%]

Amazon
AWS

   iii. Normalise the above relation R into 3NF, showing the dependency diagrams for each table. [15%]

   iv. Normalise the above relation R into BCNF, showing the dependency diagrams for each table. [15%]

4. (a) Explain the term Domain using a relational schema example. [10%]

(b) State what do you meant by the term unary and binary operators in the context of relational algebra. [20%]

(c) List three examples of unary and binary operators. [10%]

(d) Consider the following relational database schema consisting of the four relation schemas:

passenger (pid, pname, pgender, pcity)

agency (aid, aname, acity)

flight (fid, fdate, time, src, dest)

booking (pid, aid, fid, fdate)

Answer the following questions using SQL commands;

i. Get the details about all flights from Palaly to Chennai. [10%]

ii. Find only the flight numbers for passenger with pid 123 for flights to Chennai before 14/01/2024. [15%]

iii. Find the passenger names for passengers who have bookings on at least one flight.[15%]

iv. Get the details of flights that are scheduled on 14/02/2024 and 18/02/2024 at 16:00 hours. [20%]

5. (a) Explain Entity Set with suitable example. [10%]

(b) Differentiate Composite attribute and Multi-valued attribute with suitable example. [10%]

(c) Compare and contrast the Connectivity and Cardinality in terms of Relational Schema.[15%]

(d) Consider a university database for the scheduling of lecture halls for final examination. This database could be modelled as entity set exam, with attributes Course-name, Course_code, Lecture_hall_number, Supervisor name, Invigilator name, Hall attendants name and time(could be starting time and ending time). Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the examination entity set, as:

- Lecture_hall with attributes Lecture_hall_number and size(must be student count of maximum allocation), and dependent as a weak entity set on course.
- Each examination should have one supervisor and one invigilator per 30 students have and each examination hall have two hall attendants who have Hall_attendant_id, Name, NIC and Department_name.
- Each examination should supervised by a supervisor who has Supervisor_id, Name, Department and Experience and Invigilators depended on students count with attributes Invigilator_id, nature of appointment(permanent and temporary employees), Department_name and Invigilator_name.

[Question 5 continues on the next page]

- Each hall can have one examination at a time. Within the examination halls we have two types of examination; one is theory examination and practical examination which have same attribute, but using their id and name we can identify their type. If practical examination is conducted, then we will have only one examination.
- Supervisors, invigilators, and hall attendants can have only one examination at a time.
- Each examination for each course will be conducted.Course can be identified using the attributes of Course_name, course_code, department, and Lecturer_in_charge_name. One department has more than one courses in each semester and one lecturer can teach more than one courses in each semester. However, compulsory one lecturer will be assigned at least one course in each semester compulsorily.

(e) Draw an entity relationship diagram with all the keys and attributes type consideration. [50%]

(f) Mention all Derived, Composite and Multivalued attributes with their proper entities.[15%]

End

University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January - 2023/2024

TICT2252: System Analysis and Design

- ⊙ Answer **four questions** only.
- ⊙ This paper has **five questions** on **three pages**.
- ⊙ Time allowed: **Two Hours**.
- ⊙ Answering the question on a new page.

1. (a) Describe the concepts of *generalization* and *specialization* in an Enhanced Entity Relationship (EER) diagram with the aid of an example. [20%]

   (b) Explain the distinctions among the terms *primary key*, *candidate key*, and *superkey* with suitable examples. [20%]

   (c) Briefly describe the features of *object oriented system.* Encapsulation, Inheritance, polymorphism, Abstraction [25%]

   (d) State four benefits of *object oriented model* in the context of system analysis. Relashinships [20%]

   Inheritance hiding, Repeating, Relationships,

   (e) Unified Modelling Language (UML) defines specific notations for each of building blocks. Describe the usage of each of the following notations:

   i. + public Attribute, class, ~~varia~~ methods

   ii. - private

   iii. # Protected [15%]

2. (a) Compare and contrast *object diagram* and *class diagram.* [15%]

   (b) Explain the different degree of multiplicity of an association between classes with the aid of an example.

   i. One-to-One association

   ii. One-to-Many association

   iii. Many-to-Many association [25%]

   part of based on

   (c) Explain the concept of both *aggregation* and *composition* of class hierarchies using suitable example and class diagram. [20%]

   (d) Consider the following system of *Vending Machine.*

   A vending machine sells small, packaged, ready to eat items (chocolate bars, cookies, candies, etc.). Each item has a price and a name. A customer can buy an item, using a smart card (issued by the vending machine company) to pay for it. No other

[Question 2 continues on the next page]

payment forms (either cash or credit card) are allowed. The smart card records on it the amount of money available.

The following functions are supported by the system:

i. Sell an item (choose from a list of items, pay item, distribute item)

ii. Recharge the machine

iii. Set up the machine (define items sold and price of items)

iv. Monitor the machine (number of items sold, number of items sold per type, total revenue)

The system can be used by a customer, a maintenance employee (who recharges items in the machines), an administrator (who sets up the machine).

Model a class diagram for the above system. [40%]

3. (a) Briefly describe each of the following relationship with the aid of an example in the context of use case diagrams with suitable example.

i. Extend relationship

ii. Include relationship

iii. Association between actor and use case [30%]

(b) Read the following scenario and draw the *use case diagram* for the Pizza Ordering System with extend, include and other associations between use cases.

The Pizza Ordering System allows the user of a web browser to order pizza for home delivery. To place an order, a shopper searches to find items to purchase, adds items one at a time to a shopping cart, and possibly searches again for more items. When all items have been chosen, the shopper provides a delivery address. If not paying with cash, the shopper also provides credit card information. The system has an option for shoppers to register with the pizza shop. Then, they can save their name and address information, so that they do not have to enter this information every time that they place an order. [70%]

4. (a) Compare and contrast *sequence diagram* and *collaboration diagram*. [15%]

(b) Briefly explain each of the following *messages* used in a *system interaction diagram*.

i. Synchronous message

ii. Return message

iii. Lost message [30%]

(c) List down the attributes of a *lifeline* in an interaction diagram with clear explanation. [15%]

(d) Draw a *sequence diagram* for creating a new user account of *Online Library Management System* based on the following functionalities:

- When a user makes request for creating a new account, the registration module verifies availability of that account.
- If the account is not existed, then the system allows user to create new account by providing their information.
- Then the data is stored in the database, which is followed by sending account creation confirmation message to the user. [40%]

5. (a) State three aspects of drawing an *activity diagram.* [10%]

   (b) Define the following elements of an *activity diagram.*

      i. Activities

      ii. Conditions

      iii. Constraints [30%]

   (c) Depict an *activity diagram* for resolving issues in a software design based on the following requirements:

   - The process is expected to be commenced after creating ticket by some authority.
   - After ticket is created, the issue is reproduced, issue is identified, resolution is determined, issue is fixed and verified.
   - Then, if the issue is resolved then the ticket is closed. [60%]

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End

University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January - 2023/2024

TICT2212: Operational Research

- Answer **four questions** only.
- This paper has **five questions** on **three pages**.
- Time allowed: **Two Hours**.
- Start answering question on a new page

1. (a) Compare and contrast the Critical Path Method (CPM) and Project Evaluation and Review Technique (PERT). [20%]

   (b) List out the important steps to be applied in solving a project network. [10%]

   (c) University of Vavuniya is planning to construct a new multipurpose athletic complex. The complex would provide a new gymnasium for intercollegiate basketball games, expanded office space, classrooms, and intramural facilities. The following activities would have to be undertaken before construction can begin.

Activity	Description	Immediate Predecessor	Time (weeks)
A	Survey building site	–	6
B	Develop initial design	–	8
C	Obtain board approval	A,B	12
D	Select architect	C	4
E	Establish budget	C	6
F	Finalize design	D,E	15
G	Obtain financing	E	12
H	Hire contractor	F,G	8

   i. Draw the project network diagram. [30%]

   ii. Identify the critical activities and critical path. [30%]

   iii. Find the project completion time. [10%]

2. The manager of an oil refinery has to decide upon the optimal mix of two possible blending processes, of which the inputs and outputs per production run are as follows:

	Input		Output	
Process	**Crude A**	**Crude B**	**Gasoline X**	**Gasoline Y**
1	5	3	5	8
2	4	5	4	4
	200	150	100	80

The maximum amount available of crude A and B is 200 units and 150 units respectively. Market requirements show that at least 100 units of gasoline X and 80 units of gasoline Y must be produced. The profits per production run from process 1 and process 2 are Rs.200 and Rs.400 respectively.

(a) Formulate the problem as a linear programming problem. [40%]

(b) Construct a graph and plot the constraint lines using the above linear programming model. [40%]

(c) Identify the feasible region. [10%]

(d) Find the optimum solution. [10%]

3. (a) How do the graphical and simplex methods of solving linear programming differ. [10%]

(b) What is the difference between a primal model and a dual model. [10%]

(c) Consider the following linear programming problem:

Maximize $Z = 7x_1 + 4x_2 + 8x_3$,

subject to

$x_1 + x_2 + 2x_3 \leq 14$

$x_1 + 2x_2 + x_3 \leq 20$

$2x_1 + x_2 + 3x_3 \leq 24$

Where x_1 , x_2 and $x_3 \geq 0$.

i. Use the simplex method to find optimum solution. [70%]

ii. What are the benefits of the dual simplex method in solving LP model. [10%]

$7 \times \frac{2}{1}$

14

$3 \div \frac{1}{5}$ $13 \times \frac{2}{1}$

$3 \times \frac{2}{1}$ 26

4. The table below shows the cost of transporting one unit of stock from each supply points F,G, H and I to each of four sales points P,Q, R and S, it also shows the stock held at each supply points and the amount required at each sales point.

	P	Q	R	S	Supply
F	18	14	32	26	300
G	21	34	15	12	250
H	12	19	20	22	350
I	20	18	14	16	150
Demand	150	400	200	300	

(a) Use the North-West corner method to obtain an initial solution [30%]

(b) Find the initial solution to the above transportation problem using the vogel's approximation method. [50%]

(c) Formulate the above problem as a linear programming problem. [20%]

5. (a) An airline company has drawn up a new flight schedule involving five flights. To assist in allocating five pilots to the flights, it has asked them to state their preference scores by giving each flight a number out of 10. The higher the number, the greater is the preference as shown in the below table.

	I	II	III	IV	V
A	8	5	6	4	7
B	6	7	7	8	5
C	6	4	5	9	3
D	2	3	8	9	6
E	4	9	8	6	6

What should be the allocation of the pilots to flights in order to meet as many preferences as possible. [70%]

(b) Write down the dual of the following linear programming problem:

Minimize $Z = x_2 + 3x_3$,

subject to

$2x_1 + x_2 \geq 3$

$x_1 + 2x_2 + 6x_3 \geq 5$

$-x_1 + x_2 + 2x_3 \geq 2$

Where x_1 , x_2 and $x_3 \geq 0$. [30%]

University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January 2023/2024

TICT2244: Computer Graphics (Practical)

- ⊙ Answer **all questions**.
- ⊙ This paper has **two questions** on **three pages**.
- ⊙ Time allowed: **Three Hours**.
- ⊙ Create a folder on your desktop and name it with your index number (e.g.: TSXXXX) and save your codes in that folder.
- ⊙ The necessary images and sample output images are in the resource folder.

1. Write a Java program to perform each of the following tasks:

   (a) Implement the Midpoint circle algorithm to draw a circle. [10%]

   (b) Construct an object as shown in Figure 1 using the circle drawing algorithm implemented in the above part (a), where the radius r of the largest circle should be obtained by a mouse event. [**Note:** For calculate the radious, consider the distance formed by the event mouse pressed and mouse released.] [20%]

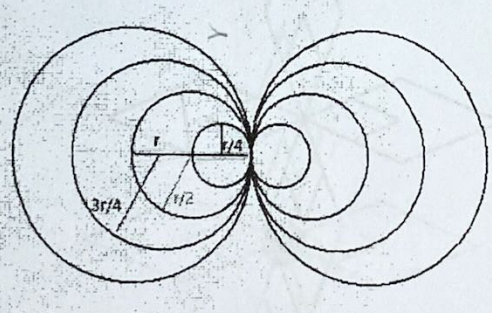


Figure 1: Circle image

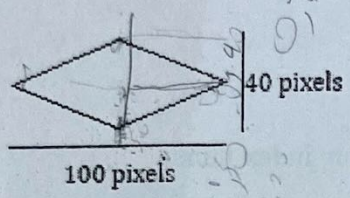
2. Write a Java program to perform each of the following tasks:

   (a) Write a Java program to implement the *DDA line drawing algorithm.* [Note that coordinate x and y are obtained by mouse clicks] [10%]

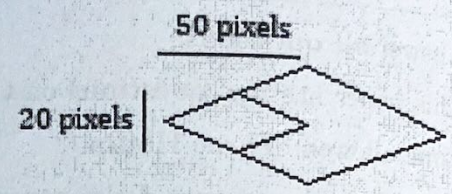
[Question 2 continues on the next page]

(b) Create Object 1 as shown in Figure 2 (a) by using the program written in the above part (a) and obtain Object 2 shown in Figure 2 (b) using any appropriate 2-D transformation technique applied on Object 1 shown in Figure 2 (a).

[20%]



(a) Object 1



(b) Object 2

Figure 2: Diamond Shape

(c) Create the Object 3 as shown in Figure 3 by applying any suitable 2-D transformation on Object 2, which is constructed in part (b).

[20%]

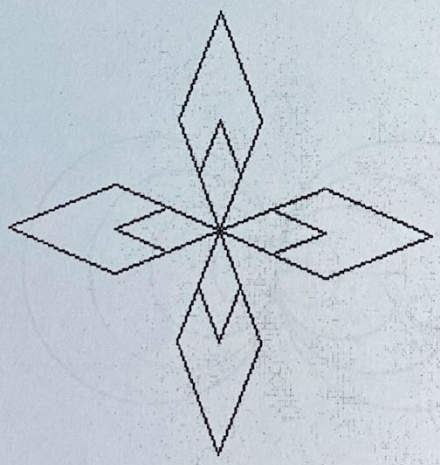


Figure 3: Object 3

[Question 2 continues on the next page]

(d) Draw a circle with a radius of 10 pixel in the middle of the Object 3 as shown in Figure 4 using the midpoint circle drawing algorithm. [10%]

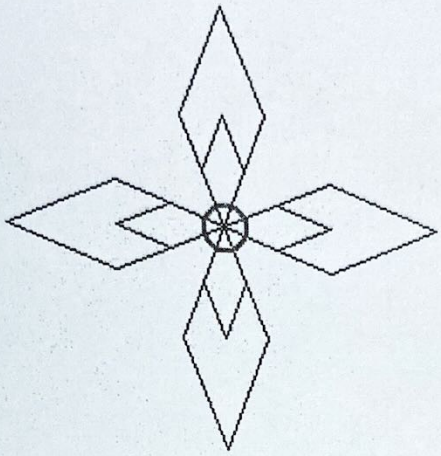


Figure 4: Object 4

(e) Change the background color of the circle into blue using the appropriate filling algorithm as shown in Figure 5. [10%]

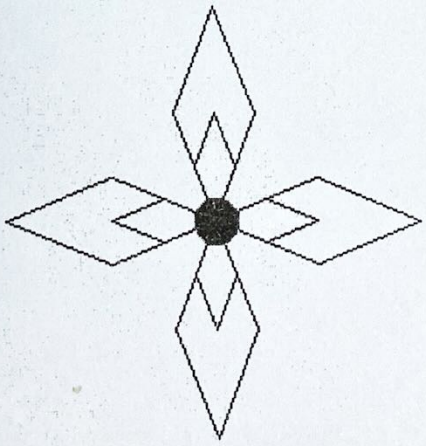


Figure 5: Object 5

End

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University of Vavuniya, Sri Lanka

Second Examination in Information and Communication Technology - 2021

Second Semester - December/January - 2023/2024

TICT2222: Introduction to Computer Networks

- ⊙ Answer **four questions** only.
- ⊙ This paper has **five questions** on **three pages**.
- ⊙ Time allowed: **Two Hours**.
- ⊙ Start answering question on a new page.

sender source, Receiver

1. (a) Describe three criteria necessary for an effective and efficient network. [20%]

   (b) Discuss the difference between half-duplex and full-duplex transmission modes. [15%]

   walki talki telephone convercations

   (c) State four basic network topologies and give an advantage of each type. [15%]

   Mesh, star, Ring, BUS.

   (d) Describe the differences between Local Area Network (LAN) and Wide Area Network (WAN). [15%]

   in school

   bank Internet.

   (e) Briefly state what is meant by *protocol layering* in data communication. [15%]

   (f) Describe each of the following addressing used in TCP/IP protocol suite and state the layer on which they are used:

   i. Names

   ii. Port numbers

   iii. Logical addresses

   iv. Link-layer addresses [20%]

   Application
   Presentation
   Session
   Transport
   Network
   Data Link
   physical

   Application
   Transport
   Network
   physical

2. (a) A periodic signal is decomposed into five Sine waves with frequencies 0, 150, 350, 550 and 750 Hz.

   i. Calculate the bandwidth for this signal. [5%]

   ii. Draw the spectrum, assuming all the components have a maximum amplitude of 5 V. [10%]

   variations of delay

   (b) Briefly describe each of the followings that cause transmission impairment in data communication:

   i. Attenuation

   ii. Distortion

   iii. Noise [25%]

[Question 2 continues on the next page]

(c) Consider a bit sequence **0110111001**. Draw the signal for the following line coding schemes, assuming that the last signal level is positive:

i. Non-Return-To-Zero Invert (NRZ-I)

ii. Manchester

iii. Alternate Mark Inversion (AMI) [25%]

(d) Compare and contrast Pulse Code Modulation (PCM) and Delta Modulation (DM). [20%]

(e) Briefly state what is meant by *carrier signal* and explain its role in analog transmission. [15%]

Analog data transmission

3. (a) Briefly describe each of the following analog-to-analog conversion techniques and draw the modulated signal for each by considering suitable examples:

i. Amplitude Modulation (AM)

ii. Frequency Modulation (FM) [25%]

(b) Clearly state how guided media differ from unguided media. [15%]

(c) Describe how interference and crosstalk could be reduced in twisted-pair cable. [15%]

(d) Discuss the advantages of optical fiber over twisted-pair and coaxial cables. [10%]

(e) Briefly describe each of the following propagation methods with the aid of digrams:

Ground propagation i. Sky propagation

ii. Line-of-sight propagation [20%]

(f) Differentiate between Omnidirectional antenna and unidirectional antenna. [15%]

4. (a) Consider a Local Area Network (LAN) shown in Figure 1. System A has a packet that needs to be delivered to System B. Briefly explain how System A finds the link-layer address of System B using Address Resolution Protocol (ARP). [25%]

L: Link-layer address of a node

N: IP address of a node

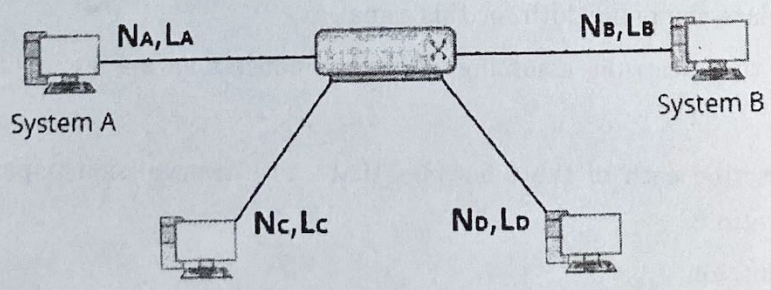

Figure 1: A LAN

[Question 4 continues on the next page]

200×10+20
220KHz

(b) Distinguish between a link and a channel in multiplexing. [10%]

(c) Describe the goals of multiplexing. [10%]

(d) Assume that a voice channel occupies a bandwidth of 200 kHz. We need to multiplex eleven voice channels with guard bands of 20 kHz using Frequency Division Multiplexing (FDM). Calculate the required bandwidth. [15%]

(e) Compare and contrast a circuit-switched network and a packet-switched network. [20%]

(f) Briefly describe each of the following services provided by Data Link Control (DLC) sublayer:

i. Framing

ii. Flow control

iii. Error control [20%]

5. (a) Briefly describe each of the following protocols which are used at data-link layer:

i. Simple protocol

ii. Stop-and-Wait Protocol [20%]

(b) Define what is meant by *Piggybacking* in data communication and state its benefit. [15%]

(c) Clearly state how a single-bit error differ from a burst error. [15%]

(d) i. Describe block coding and state its purpose. [18%]

ii. In a block code, a dataword is 16 bits and the corresponding codeword is 20 bits. How many redundant bits are added to each dataword? [2%]

(e) Consider the Cyclic Redundancy Check (CRC) based error detecting scheme, having the divisor **1011**. Suppose the bit string **1001** is to be transmitted from System A to System B.

4 4

i. Find out the actual bit string which is sent from System A. [15%]

ii. If the received bit string at the System B is **1000110**. Justify that the System B will discard the received bit string. [15%]

End