SASTRA
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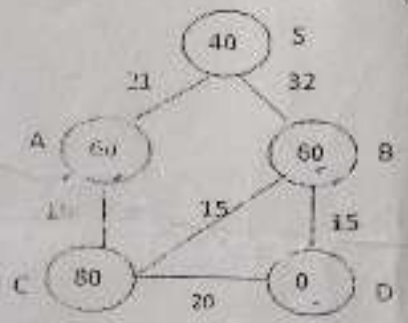
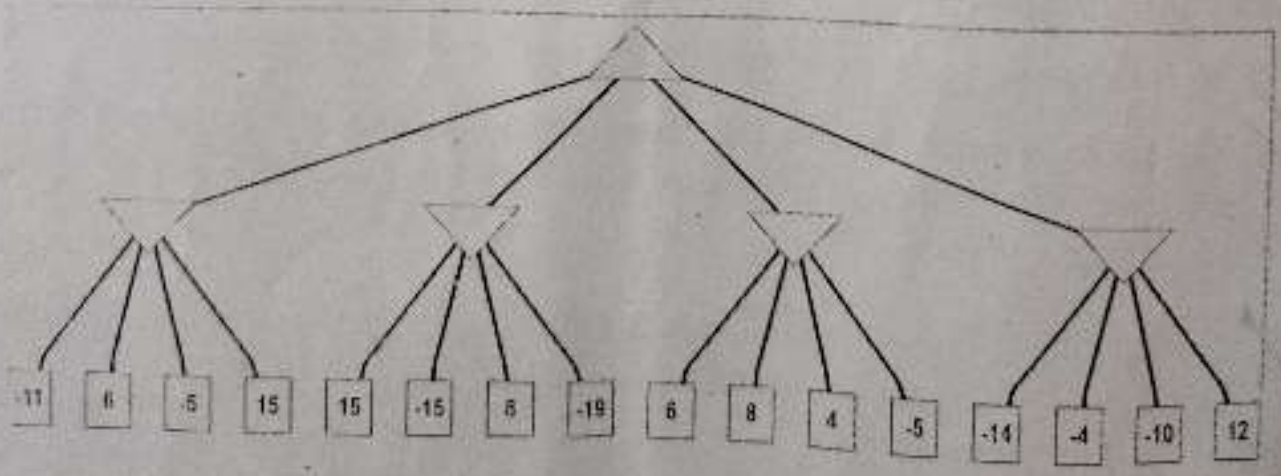
School of Computing
Second CIA Exam – Mar 2024
Course Code: INT314
Course Name: Artificial Intelligence and Logical Reasoning
Duration: 90 minutes Max Marks: 50

Answer ANY FOUR questions **PART A** **4 x 10 = 40 Marks**

6. Bot wants to reach Railway Station in a city from your college (S). The SLD values are given in circle. Path costs are given in edges. First find the goal from these values. Then apply A* search to get minimal cost. Step by step process along with formula should be given. (10)




7. Consider the following tree is a part of Tic-Tac-Toe game played by two palyers. Apply alpha-beta pruning process to reduce the number of branches or nodes to be searched by. (α,β values are to mentioned) (10)



3. Illustrate the represention of isa relationship (10)

4. You are playing chess game with system. Discuss the steps of mini-max algorithm with your friend to provide him idea about adversarial board game with example. (10)

5. a) Discuss the steps of Hill climbing algorithm and its concepts. (5)

b) Discuss the process stages of genetic algorithm based on 8-queen problem. (5)

**Answer the question** **PART B** 1 x 10 = 10 Marks

6. Answer the following questions (10)

a) Discuss Modus ponens

b) You are asked to give knowledge about CSP to Chitti, the bot, How will you define?

c) Your younger brother wants to explore Sudoku puzzle. Help him by describing the type of constraint you have to use and Justify.

d) The number non attacking positions for each queen in 8 queen problem are given (for 4 strings of positions.). They are 38,43,25,12. Calculate the success percentage.

e) Convert the following sentences into FOL statements
"There is a mushroom that is purple and poisonous"
"All Bunnies are cute"

SASTRA

School of Computing
Third CIA Exam – May 2023
Course Code: INT314
Course Name: Artificial Intelligence and Logical Reasoning
Duration: 80 minutes
Max Marks: 50

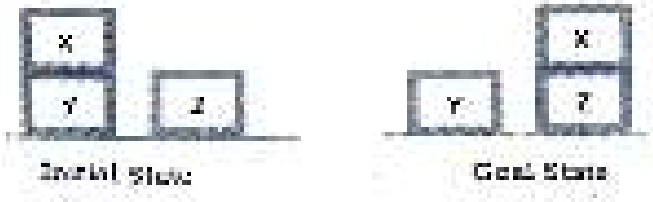
**Answer ANY FOUR questions** **PART A** **4 x 10 = 40 Marks**

1. a. Define joint probability distribution. (2)
   b. List the four phases of knowledge acquisition process. (2)
   c. Apply appropriate rule to remove implication and rewrite the following sentence as disjunction of predicates. (2)
   $\forall x$ Queen(x) ^ Humble(x) $\rightarrow$ Great (x). Keep ground term as 'Lara craft'.
   d. Illustrate nested quantifier. (2)
   e. How will you search for short and easy path to reach goal in a maze puzzle. Recall the advantage of that search. (2)

2. A. Find the unifier for the following FOL statements. (5)
   i) Knows(Alpha,x) -Knows(Alpha,Beta). ii )Knows(Alpha,x) -Knows(y,Gamma), iii) Knows(Alpha,x) -Knows(y,Mother(y)) , iv)Knows(Alpha,x)-Knows(x,Gamma). v)Knows(Alpha,x)-Knows(y,z)

   B. Define Illustrate and discuss CSP. (5)

3. Discuss Resolution refutation steps of FOL with example. (10)
4. Summarize the components of Expert Systems. (10)
5. Construct goal stack planning with block world examples given below. (10)




Initial State Goal State

**Answer ALL questions** **PART B 1 x 10 = 10 Marks**

6. a. Apply alpha beta pruning for the tree given below and provide alpha beta values for each node and mark the pruned branch(s) if any. (4)


   b. Illustrate the process of forward chaining using FOL. (7)

SASTRA

# SCHOOL OF COMPUTING

**I CTA –Feb 2023**

Course Code: COM 117

B.Tech., (CSBS) – III Year Sem.: VI

Financial and Cost Accounting

Duration: 90 minutesMax Marks: 50

**Part A (10 × 2 = 10 Marks)**

**Answer ALL the Questions:**

1. What is Marshalling of Balance Sheet? Give example.
2. (a) Draw the accounting equations. (b) Total assets of a firm are Rs.20 Lakhs and their outside Liabilities are Rs.42 Lakhs. Find out the owner's investment into the firm.
3. State the intangible and fictitious assets.
4. Write a note on "Prudence" with an illustration.
5. Draw the trunks and leaves of GAAP.
6. Write a note on (a) Accrued Income; (b) Unearned revenue;
7. List out the financial statement analytical tools.
8. Pass Journal Entries for the following transactions in a proper format:
   15.02.2023 Saravanan started business with Rs. 1,00,000.
   16.02.2023 Received cash from Balu Rs. 25,000.
   17.02.2023 Purchase of Machinery Rs. 50,000.
   18.02.2023 Sold goods to Jaleel on credit Rs 1,00,000.
9. Fill up the following Trial Balance:

| Name of Accounts | Dr. | Cr. | Reason |
|---|---|---|---|
| Accumulated Depreciation on Machinery Rs.14020 | | | |
| Prepaid Rent Rs.2000 | | | |
| Accrued Expenses Rs.1500 | | | |
| Unexpired Insurance Rs.8500 | | | |

10. You are required to calculate the Total Passengers using 2020 as the base year and comment on its performance:(*Ans: As Table*)

| Particulars | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| Sales | 340 | 340 | 420 | 480 |
| Cost of Goods Sold | 180 | 204 | 256 | 287 |
| Office Expenses | 40 | 42 | 45 | 50 |
| Selling Expenses | 20 | 25 | 30 | 40 |
| Net Profit | 60 | 69 | 89 | 103 |

## Part – B (3×10=30 Marks)

### Answer ALL the questions:

11. Draw the accounting cycle and explain its components with detailed formats.
12. From the following Trial balance of Thiru M. Saboresh as on 31-3-2017. Prepare Trading & Profit and Loss account and Balance Sheet.

| Debit Balances | Rs. | Credit Balances | Rs. |
|---|---|---|---|
| Land and Building | 42,000 | Capital | 62,000 |
| Machinery | 20,000 | Sales | 98,780 |
| Patents | 7,500 | Return outwards | 500 |
| Stock 1-4-16 | 5,760 | Sundry Creditors | 6,300 |
| Sundry debtors | 14,500 | Bills Payable | 9,000 |
| Purchases | 40,575 | | |
| Cash in hand | 540 | | |
| Cash at bank | 2,630 | | |
| Return Inwards | 680 | | |
| Wages | 8,480 | | |
| Fuel and power | 4,750 | | |
| Carriage outwards | 3,300 | | |
| Carriage inwards | 2,040 | | |
| Salaries | 15,000 | | |
| General Expenses | 3,000 | | |
| Insurance | 600 | | |
| Drawings | 5,245 | | |
| **Total** | **1,76,590** | **Total** | **1,76,580** |

**Adjustments:** 1. Stock on 31-3-2017 was Rs. 6,800; 2. Salary outstanding Rs. 1,500; 3. Insurance Prepaid Rs. 150; 4. Depreciate Machinery @ 10% and patents @ 20%; 5. Create a provision of 2% on debtors for bad debts.

13. From the following Balance Sheets of Kandan Ltd as on 31.03.2022 and 2023, you are required to prepare report by using the financial statement analytical tools for the year ended 31.03.2023:

**Balance Sheets**

| Liabilities | 2022 Rs. | 2023 Rs. | Assets | 2022 Rs. | 2023 Rs. |
|---|---|---|---|---|---|
| Share Capital | 1,00,000 | 1,00,000 | Goodwill | 12,000 | 12,000 |
| Reserve | 14,000 | 18,000 | Building | 40,000 | 36,000 |
| P & L a/c | 16,000 | 13,000 | Plant | 37,000 | 36,000 |
| Creditors | 8,000 | 5,400 | Investment | 10,000 | 11,000 |
| Bills Payable | 1,200 | 800 | Stock | 30,000 | 23,400 |
| Provision for Tax | 16,000 | 18,000 | Bills Receivable | 2,000 | 3,200 |
| Provision for Debts | 400 | 600 | Debtors | 18,000 | 19,000 |
| | | | Cash | 600 | 200 |
| | | | Bank | 6,000 | 15,000 |
| **Total** | **1,55,600** | **1,55,800** | **Total** | **1,55,600** | **1,55,800** |

**------End of Question Paper------**

# SCHOOL OF COMPUTING

**IICIA – March 2023**

Course Code: COM 117

**B.Tech., (CSBS) – III Year Sem.: VI**

**Financial and Cost Accounting**

Duration: **90 minutes** Max Marks: **50**

**Part A (10 × 1 = 10 Marks)**

**Answer ALL the Questions, each carries ONE mark. Answer in one sentence.**

1. What is capital gearing ratio?
2. Calculate Return on Investments (ROI) if the Operating Profit Rs.1,50,000; Capital Employed Rs.12,00,000; Tax Rs.50,000.
3. Calculate Prime Cost, when the Direct Materials Rs.20,000; Direct Labour Rs.30,000; Direct Expenses Rs.10,000; Factory Overheads Rs.15,000.
4. What are the different methods of depreciating the assets in a manufacturing company?
5. What is meant by capital gearing ratio?
6. Enlist the components for preparing fund flow statement.
7. Draw the format of cash flow statement.
8. What is gross working capital?
9. Write a note on BRS.
10. State the errors that do not affect the trial balance.

**Part – B (2×10=20 Marks)**

**Answer any TWO questions**

11. Differentiate between Fund Flow Analysis and Cash Flow Analysis.
12. Classify and present the different types of ratios. Brief the significance of each ratio.
13. Prepare a fund flow statement or cash flow statement for the following Balance Sheets:

| Assets | 2022Rs. | 2023Rs. |
|---|---|---|
| Bank | 15,380 | 26,020 |
| Debtors | 11,260 | 11,210 |
| Stock | 55,150 | 50,400 |
| Fixed Assets | 2,17,200 | 2,19,810 |
| Total Assets | 3,00,000 | 3,07,500 |
| Liabilities | 2022Rs. | 2023Rs. |
| Creditors | 20,000 | 15,500 |
| Bills Payable | 12,750 | 6,500 |
| Debentures | 1,00,000 | 1,00,000 |
| Reserves | 67,250 | 84,500 |
| Paid up capital | 1,00,000 | 1,00,000 |
| Total Liabilities | 3,00,000 | 3,07,500 |

## Part – C (1×20=20 Marks)

### Answer ANY ONE question.

14. From the following given ratios and figures prepare a summerised Balance Sheet of XYZ Co. Ltd., for the year ended 31st December 2022:

(a) Working Capital Rs.60,000
(b) Reserve and Surplus Rs.40,000
(c) Bank Overdraft Rs.10,000
(d) Assets (fixed) proprietorship ratio 0.75
(e) Current ratio 2.50
(f) Liquid ratio 1.50

15. Comment on the financial position and performance of Perfect Company Ltd, from the following Balance Sheets and other relevant details:

| Assets | 2022 Rs. |
|---|---|
| Goodwill | 1,30,000 |
| Fixed Assets | 2,80,000 |
| Stock | 80,000 |
| Debtors | 40,000 |
| Bills Receivable | 20,000 |
| Cash | 60,000 |
| Total Assets | 6,00,000 |
| **Liabilities** | **2022 Rs.** |
| Equity Share Capital (Rs.100 each) | 2,00,000 |
| Reserves | 40,000 |
| Profit and Loss A/c | 60,000 |
| Secured Loan | 1,80,000 |
| Creditors | 1,00,000 |
| Provision for Tax | 40,000 |
| Total Liabilities | 6,00,000 |
| Net Sales | 12,00,000 |
| Gross Profit | 6,50,000 |
| Operating Profit | 5,00,000 |
| Net Profit after Tax and Interest | 2,00,000 |

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# SCHOOL OF COMPUTING

IICIA – March 2023

Course Code: COM 117

B.Tech., (CSBS) – III Year Sem.: VI

**Financial and Cost Accounting**

Duration: 90 minutes Max Marks: 50

**Part A (10 × 1 = 10 Marks)**

**Answer ALL the Questions, each carries ONE mark. Answer in one sentence.**

1. What is capital gearing ratio?
2. Calculate Return on Investments (ROI) if the Operating Profit Rs.1,50,000; Capital Employed Rs.12,00,000; Tax Rs.50,000.
3. Calculate Prime Cost, when the Direct Materials Rs.20,000; Direct Labour Rs.30,000; Direct Expenses Rs.10,000; Factory Overheads Rs.15,000.
4. What are the different methods of depreciating the assets in a manufacturing company?
5. What is meant by capital gearing ratio?
6. Enlist the components for preparing fund flow statement.
7. Draw the format of cash flow statement.
8. What is gross working capital?
9. Write a note on BRS.
10. State the errors that do not affect the trial balance.

**Part – B (2×10=20 Marks)**

**Answer any TWO questions**

11. Differentiate between Fund Flow Analysis and Cash Flow Analysis.
12. Classify and present the different types of ratios. Brief the significance of each ratio.
13. Prepare a fund flow statement or cash flow statement for the following Balance Sheets:

| Assets | 2022Rs. | 2023Rs. |
|---|---|---|
| Bank | 15,380 | 26,020 |
| Debtors | 11,260 | 11,210 |
| Stock | 56,160 | 50,460 |
| Fixed Assets | 2,17,200 | 2,19,810 |
| Total Assets | 3,00,000 | 3,07,500 |
| **Liabilities** | **2022Rs.** | **2023Rs.** |
| Creditors | 20,000 | 16,500 |
| Bills Payable | 12,750 | 6,500 |
| Debentures | 1,00,000 | 1,00,000 |
| Reserves | 67,250 | 84,500 |
| Paid up capital | 1,00,000 | 1,00,000 |
| Total Liabilities | 3,00,000 | 3,07,500 |

## Part – C (1×20=20 Marks)
## Answer ANY ONE question.

14. From the following given ratios and figures prepare a summarized Balance Sheet of XYZ Co. Ltd., for the year ended 31st December 2022:

(a) Working Capital Rs.60,000
(b) Reserves and Surplus Rs.40,000
(c) Bank Overdraft Rs.10,000
(d) Assets (fixed) proprietorship ratio 0.75
(e) Current ratio 2.50
(f) Liquid ratio 1.50

15. Comment on the financial position and performance of Perfect Company Ltd., from the following Balance Sheets and other relevant details:

| Assets | 2022<br>Rs. |
|---|---|
| Goodwill | 1,20,000 |
| Fixed Assets | 2,80,000 |
| Stock | 80,000 |
| Debtors | 40,000 |
| Bills Receivable | 20,000 |
| Cash | 60,000 |
| Total Assets | 6,00,000 |
| **Liabilities** | **2023<br>Rs.** |
| Equity Share Capital (Rs.100 each) | 2,00,000 |
| Reserves | 40,000 |
| Profit and Loss A/c | 60,000 |
| Secured Loan | 1,60,000 |
| Creditors | 1,00,000 |
| Provision for Tax | 40,000 |
| Total Liabilities | 6,00,000 |
| Net Sales | 12,00,000 |
| Gross Profit | 6,50,000 |
| Operating Profit | 5,00,000 |
| Net Profit after Tax and Interest | 2,00,000 |

====== **End of Question Paper** ======

SASTRA

# SCHOOL OF COMPUTING

**III CIA – May 2023**

**Course Code: COM 117**

**B.Tech., (CSBS) – III Year Sem.: VI**

**Financial and Cost Accounting**

**Duration: 90 minutes** **Max Marks: 50**

5

## Part A (10 × 1 = 10 Marks)

**Answer ALL the Questions, each carries ONE mark. Answer in one sentence.**

1. Define Cost Centre.
2. Differentiate between auditing and investigation.
3. Identify the types of functional budgets
4. List out the significance of auditing.
5. Comment on the importance of IFRS.
6. Draw the format of cash budget.
7. What do you understand by break even?
8. Calculate BES from the following data: Sales Rs.5 Lakhs; Variable Cost Rs.3 Lakhs and Fixed Cost Rs.1 Lakh.
9. Bring out the limitations of funds flow statement.
10. State the meaning of environmental audit.

## Part – B (2×10=20 Marks)

**Answer any TWO questions**

11. Explain the various stages involved in environmental audit and its benefits to industry.
12. Examine the audit process for computerized accounting system.
13. The sales turnover and profit during two years were as follows:

| Year | Sales Rs | Profit Rs. |
|---|---|---|
| 2022 | 2,80,000 | 30,000 |
| 2023 | 3,20,000 | 40,000 |

Calculate: (a) PV Ratio, (b) BEP, (c) Sales required to earn a profit of Rs.80,000; (d) Profit when sales are Rs.2,40,000; (e) Margin of Safety for the year 2023.

## Part – C (1×20=20 Marks)

**Answer ANY ONE question.**

14. (a) Brief on the industries in which the process costing is applicable. (b) A product passes through three processes 'A', 'B', and 'C' to its completion. During April 2023, 10,000 units of finished product were produced and the following expenses were incurred:

| Particulars | Process A (Rs.) | Process B (Rs.) | Process C (Rs.) |
|---|---|---|---|
| Direct Materials | 10,000 | 20,000 | 10,000 |
| Direct Wages | 30,000 | 40,000 | 30,000 |
| Direct Expenses | 5,000 | 6,000 | 10,000 |

Indirect expenses amounted to Rs. 60,000 which are to be apportioned to the processes on basis of direct wages. Raw materials worth Rs. 90,000 were issued to Process 'A'. Ignore question process stocks and prepare the process accounts, showing cost per unit in each process.

15. The following is the cost structure of Chandran Ltd.

| Details | Level of activity | | |
|---|---|---|---|
| | 90% | 70% | 80% |
| Output (in units) | 2400 | 1800 | 3200 |
| Costs | Rs. | Rs. | Rs. |
| Materials | 48,000 | 36,000 | 64,000 |
| Wages | 14,400 | 10,800 | 19,200 |
| Factory overheads | 25,600 | 27,200 | 28,800 |
| Factory cost | 88,000 | 74,000 | 1,12,000 |

The factory is considering an increase of production to 95% level of activity. No increase in fixed overheads is expected at this level. The management requires a statement showing all details of factory cost at 90% level of activity.

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SASTRA

# SCHOOL OF COMPUTING

**III CIA – May 2023**

Course Code: **COM 117**

**B.Tech., (CSBS) – III Year Sem.: VI**

**Financial and Cost Accounting**

Duration: **90 minutes** Max Marks: **50**

**Part A (10 × 1 = 10 Marks)**

**Answer ALL the Questions, each carries ONE mark. Answer in one sentence.**

1. Define Cost Centre.
2. Differentiate between auditing and investigation.
3. Identify the types of functional budgets.
4. List out the significance of auditing.
5. Comment on the importance of IFRS.
6. Draw the format of cash budget.
7. What do you understand by batch costing?
8. Calculate BES from the following data: Sales Rs.5 Lakhs; Variable Cost Rs.3 Lakhs and Fixed Cost Rs.1 Lakh.
9. Bring out the limitations of funds flow statement.
10. State the meaning of environmental audit.

**Part – B (2×10=20 Marks)**

**Answer any TWO questions**

11. Explain the various stages involved in environmental audit and its benefits to industry.
12. Examine the audit process for computerized accounting system.
13. The sales turnover and profit during two years were as follows:

| Year | Sales Rs. | Profit Rs. |
|---|---|---|
| 2022 | 2,80,000 | 30,000 |
| 2023 | 3,20,000 | 40,000 |

Calculate: (a) P/V Ratio; (b) BEP; (c) Sales required to earn a profit of Rs.80,000; (d) Profit when sales are Rs.2,40,000; (e) Margin of Safety for the year 2023.

## Part – C (1×20=20 Marks)

**Answer ANY ONE question.**

14. (a) Brief on the industries in which the process costing is applicable. (b) A product passes through three processes 'A', 'B', and 'C' to its completion. During April 2023, 10,000 units of finished product were produced and the following expenses were incurred:

| Particulars | Process A (Rs.) | Process B (Rs.) | Process C (Rs.) |
|---|---|---|---|
| Direct Materials | 10,000 | 20,000 | 10,000 |
| Direct Wages | 50,000 | 40,000 | 30,000 |
| Direct Expenses | 5,000 | 6,000 | 10,000 |

Indirect expenses amounted to Rs. 60,000 which are to be apportioned to the processes on the basis of direct wages. Raw materials worth Rs. 60,000 were issued to Process 'A'. Ignore the question process stocks and prepare the process accounts, showing cost per unit in each process.

15. The following is the cost structure of Chandran Ltd:

| Details | Level of activity | | |
|---|---|---|---|
| | 60% | 70% | 80% |
| Output (in units) | 2400 | 2800 | 3200 |
| Costs | Rs. | Rs. | Rs. |
| Materials | 48,000 | 56,000 | 64,000 |
| Wages | 14,400 | 16,800 | 19,200 |
| Factory overheads | 25,600 | 27,200 | 28,800 |
| Factory cost | 88,000 | 1,00,00 | 1,12,000 |

The factory is considering an increase of production to 90% level of activity. No increase in fixed overheads is expected at this level. The management requires a statement showing all details of factory cost at 90% level of activity.

====== **End of Question Paper** ======

SASTRA

School of Computing
I CIA Exam – Feb 2024
Course Code: ENG316
Course Name: Business Communication & Value Science IV
Duration: 90 minutes Max Marks: 50

## Part A

**Answer all the questions** 5x2= 10

1. Bring out the importance of written communication.
2. Discuss the meaning of the corporate terms- game changer, bring to the table.
3. Examine the best practices of public speaking.
4. Provide the meaning of the Business idioms- back to the drawing board, hands are tied.
5. Charts and graphs are an integral part in communicative writing. Justify.

## Part B

**Answer all the questions** 2x5= 10

6. Emotional intelligence is important in personal and professional lives. Justify.
7. Sketch the best practices for writing a proposal.

## Part C

**Answer ALL the questions** 3x10= 30

8. Discuss the Principles of Communicative Writing.
9. Draft a letter as a sales representative of your company, to the Chairman of Aditi Enterprises, introducing one of your new products.
10. Write a proposal to get funding for setting up a start-up for providing voice-based e-mail system for the visually impaired.

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**School of Computing**

**II CIA Exam – Mar 2024**

Course Code: ENG316

Course Name: Business Communication & Value Science IV

Duration: 90 minutes Max Marks: 50

## Part A

**I. Answer all the questions** 5x2= 10

1. Explain why personal motivation is a must for emotional intelligence to flourish.
2. Dressing professionally can help form a positive impression. Explain.
3. List some ethics to be followed in any work place.
4. What are the "Big Two" to be avoided in professional atmosphere? Why?
5. Forgiving paves way to resolve conflicts. Justify.

## Part B

**II. Answer all the questions** 2x5= 10

6. Sketch the Positive consequences of workplace conflict.
7. Bring out the causes of conflict which you notice between you and your friend/s.

## Part C

**III. Answer ALL the questions** 3x10= 30

8. Discuss the Key features of corporate etiquette.
9. Elaborate on the common types of conflicts in the workplace.
10. You find that your co-worker is reluctant to give his/her full potential at work. Both of you have been asked to work together and submit a report, though you don't want to work with him/her. It creates a conflict in you. Give steps to resolve this conflict that you face.

SASTRA

School of Computing
First CIA Exam – Feb 2023

Course Code: CSE322
Course Name: Computer Networking Principles and Components
Duration: 90 minutes Max Marks: 50

## PART A

10*2=20 Marks

Answer all the questions

1. Assume six devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?
2. A light signal is travelling through a fiber. What is the delay in the signal if the length of the fiber-optic cable is 10 m, 100 m, and 1 Km (assume a propagation speed of 2 x $10^8$ m/s)?
3. Assume that a voice channel occupies a bandwidth of 4 kHz. We need to combine three voice channels into a link with a bandwidth of 12 kHz, from 20 to 32 kHz. Show the configuration, using the frequency domain. Assume there are no guard bands.
4. Synchronous TDM with four 1Mbps data stream inputs and one data stream for the output. The unit of data is 1 bit. Find (a) the input bit duration,
5. Differentiate half duplex with full-duplex channel
6. Justify the functionality of session layer
7. Differentiate forward error control with backward error control schemes
8. Differentiate multi-level TDMA with the multi-slot TDMA
9. Consider the frame size is 1 Kbits and channel bandwidth is 1Mbps. Compute transmission time
10. Sketch the point-to-point and multi-point connections.

## PART B

3*10=30 Marks

Answer all

11. Consider CDMA with 4 nodes such as A, B, C and D. Chip sequences are [1,1,1,1], [1,-1,1,-1],[1,1,-1,-1], [1,-1,-1,1] respectively. Among four nodes, three stations A, B and D alone transmitting data '1','0','1' respectively. Construct the spread spectrum and extract the individual data bits from the spreading sequence. Justify its correctness.
12. Elucidate the functionalities of each layers of OSI reference model with neat architecture.
13. Consider the binary pattern '10110011011' and CRC as $x^3+x+1$. Compute checksummed frame. And assume that MSB of the checksummed frame is inverted during transit. Detect the error in the receiver side.

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THINK MERIT | THINK TRANSPARENCY | THINK SASTRA

School of Computing
First CIA Examination – Feb 2024
Course Code: CSE322
Course Name: **Computer Networking Principles and Components**

Duration: 90 minutes Max Marks: 50

## PART A

**Answer all the questions** **4X5 = 20 Marks**

1. What do you understand by Computer Networks? Explain various components of Networks.
2. Investigate the network standards and why do we need them? List commonly used standards at each layer during data communication: Describe the process adopted by organizations in creating standards.
3. Give the comparison between different wireless technologies? Enumerate 802.11 protocol stack in detail..
4. If a normal GSM timeslot consist **6** trailing bit, **8.25** guard bit, **26** training bit and **2** traffic burst of 58 bits of data, find the frame efficiency

## PART B

**Answer all the questions** **3X10 = 30 Marks**

5. Describe with a neat diagram the layered architecture of the OSI model.
6. Explain with examples the two classes of transmission media.
7. Discuss various types of network topologies in computer network. Also discuss various advantages and disadvantages of each topology.

SASTRA

School of Computing
Second CIA Exam – March 2023

Course Code: CSE322
Course Name: Computer Networking Principles and Components
Duration: 90 minutes  Max Marks: 50

## PART A

**Answer all the questions** **10*2=20 Marks**

1. Consider two-dimensional block parity for the data frame 1011 0010 1100 1111 with block size 4. Compute parity and invert 3rd bit of the first block. Detect and correct error in the receiver side.
2. Compute the hamming distance with frame–transmitted "10101010" and frame-received as "10101100"
3. Differentiate single bit error with burst error.
4. What is the demand of pipelining based protocol?
5. Justify the impact of piggybacking?
6. Consider 3-bits sequence number. What is the sender and receiver window size in Go-back-n protocol?
7. How long the vulnerable time with pure ALOHA?
8. Differentiate 1-persistent CSMA with non-persistent CSMA.
9. Differentiate hidden station problem with exposed station problem?
10. What is RTS and CTS in CSMA/CA?

## PART B

**Answer any three** **3*10=30 Marks**

11. Consider the data frame "10010011001". Compute checksummed frame based on hamming code. Assume the third bit is inverted during transit. Detect this error in the receiver side using hamming code.
12. Assume that, in a Stop-and-Wait ARQ system, the bandwidth of the line is 1 Mbps, and 1 bit takes 20 ms to make a round trip. What is the bandwidth-delay product? If the system data frames are 1000 bits in length, what is the utilization percentage of the link? How many frames to be transmitted to increase the utilization percentage as 100? Argue the use of Stop-and-wait ARQ in LAN vs WAN.
13. A pure ALOHA and slotted ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces? a. 1000 frames per second  b. 500 frames per second
c. 250 frames per second. Tabulate the results for both pure vs slotted ALOHA
14. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal, as we see later) is 25.6 μs, what is the minimum size of the frame? If collision occurs in the 4th attempt of the frame transmission, then compute minimum and maximum back-off time in the 4th attempt using binary exponential back-off algorithm.

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School of Computing
Second CIA Examination – Mar 2024
Course Code: CSE322
Course Name: **Computer Network Principles and Components**

Duration: 90 minutes Max Marks: 50

## PART A

**Answer all the questions** **10X2 = 20 Marks**

1. Define error and list its types.
2. Elucidate the need for Hamming code
3. Outline the features of checksum
4. Apply Cyclic Code Encoder Using Polynomials
   **M(x) = x3+1.**
   **G(x)= x3+x+1.**
5. Summarize ALOHA and its classification
6. Provide the strategies implemented in CSMA/CA.
7. Give your idea about piggybacking.
8. Define network layer and its services.
9. Convert IPv4 Addresses from Dotted Decimal to Binary
   **IP Address: 192.168.10.255**
10. List the performance metrics of network layer.

## PART B

**Answer any four questions** **4X5=20 Marks**

11. Enumurate the different protocols used for flow and error control in data link layer. Clearly explain the sender and receiver side algorithm for stop-and-wait ARQ protocol.
12. Station A needs to send a message consisting of 9 packets to Station B using a sliding window **(window size 3)** and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no acks from B ever get lost), then what is the number of packets that A will transmit for sending the message to B? Show using a timeline diagram.

13. If the 7 bit hamming code word received by receiver is **1011011**, assuming the even parity state whether the received code is correct or wrong? if wrong locate the bit having error?
14. Four Channels, Two with a bit rate 150 Kbps are to be multiplexed using multiple slot TDM with no synchronization bits. Answer the following questions: Assume 4 bits from the first 2 sources and 3 bits from the second 2 source.
    i. What is the size of the frame in bits?
    ii. What is the frame rate?
    iii. What is the duration of the frame?
    iv. What is the data rate?
15. Demonstrate the working of packet switching approaches.

## PART C

**Answer all the questions** **1X10 = 10 Marks**

16. a) A bit stream **10011101** is transmitted using the standard CRC method. The generator polynomial is **x3+1.**
    (i) What is the actual bit string transmitted?
    (ii) Suppose the **third bit** from the **left is inverted** during transmission. How will receiver detect this error?

    Or

    b) An organization is granted a block of address with beginning address **14.24.74.0/74**. The organization needs to have 3 sub blocks of address in three subnets.
    a) One sub block with 120 addresses.
    b) One sub block with 60 addresses.
    c) One sub block with 10 addresses.

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School of Computing
Third CIA Examination – April 2024
Course Code: CSE322
Course Name: **Computer Network Principles and Components**

Duration: 90 minutes Max Marks: 50

## PART A

**Answer all the questions** **10X2 = 20 Marks**

1. List out the four major categories of physical components in a computer network.
2. Explore the meaning and function of checksum.
3. Mention the Comparative features of IPV4 and IPV6.
4. Analyze the purpose of ARP. Why it always necessary?
5. Mention the role of DHCP.
6. Given the DUMP of a UDP header in hexadecimal format **04 21 00 0B 00 2A E2 17**. Find the following.
   a. Source port number?
   b. Destination port number?
   c. Length of user datagram?
   d. Length of the data?
7. List any four QoS Parameters.
8. Discuss the three main divisions the DNS.
9. Define FTP.
10. Clarify the role of firewall and specify the uses of packet filtering firewall

## PART B

**Answer any four questions** **4X5 = 20 Marks**

11. Elucidate the various transmission modes in detail, supported by appropriate diagrams.
12. Analyze the importance of switching. Enumerate the various switching techniques used in computer network.
13. Outline the primary objective of routing algorithm also discuss shortest path routing algorithm with suitable example.

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School of Computing
First CIA Test – February 2023
Course Code: INT313
Course Name: Computer System Security
Duration: 90 minutes
Max Marks: 50

## Part-A

**Answer all the Questions (10 x 2 =20 Marks)**

Identify the following as violation of Confidentiality, Integrity or Availability

1. (a) An unauthorized access to the password file in the UNIX system
   (b) A Denial of Service attack on the Web Server
   (c) Modifying the price of items on an e-commerce site.

2. What are the broad classes of threats in Computer Systems?

3. What are the goals of Computer System Security?

4. Let P be the set of all states and Q be the set of secure states. A Security mechanism restricts the system to the set R. Define when the Security mechanism is *secure*, *precise* and *broad*.

5. Describe how implementing Security modifies the System Development lifecycle.

6. How is a Mandatory Access Control Model different from a Discretionary Access Control Model?

7. What are the components of an Access Control Matrix? How do we obtain an Access Control List or a Capability Ticket from the Access Control Matrix?

8. Let I be some information. Under what conditions I has the property of Confidentiality with respect to the set of entities SE? Under what conditions I has the property of Integrity with respect to SE?

9. State the Simple Security Property and *-property of the Preliminary version of Bell Lapadula Model.

10. Consider the classifications: {Top Secret, Secret, Confidential} and the Categories {CHE,CS}. List all the lattice points and the security labels that can be created using the above classifications and Categories.

## Part-B

**Answer all the Questions (3 x 10 = 30 Marks)**

11. (a) Provide a sequence of Commands to create an access control matrix with the following users and resources and the associated permissions:
Users: UserA,UserB and UserC Resources:file1,file2,program1 and program2. UserA has read permission to file1 and read and execute permission to program1. UserB and UserC have read permission only to all resources.
(b) Describe states and transitions of a computer system and discuss the conditions required to maintain a secure state when transitions are applied to the states.

12. (a)When resources are classified as Top Secret,Secret,Confidential and Unclassified, Justify the "No reads up" and "No writes down" rules of the Bell Lapadula Model. Why does enforcing these rules protect the confidentiality property of the information?
(b)Using the classifications and Categories of Q10, Give examples of the dom relationship between the Security Labels.

13. (a) Discuss the role of trust with respect to the following:
(i)Applying a security patch to the Computer Operating System(ii)A formal verification that a given program P is correct
(b) Discuss why assurance is needed in the various stages of the System Development Life Cycle.

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School of Computing
Third Year B.Tech CSBS
FIRST CIA Test – February 2024
Course Code: INT313
Course Name: Computer System Security
Duration: 90 minutes Max Marks: 50

**Answer All Questions**

**PART A** **10 x2 = 20 Marks**

1. Identify the following as violation of Confidentiality, Integrity or Availability
   (a) Unauthorized use of a user login
   (b) Sending Spam mail to many users
   (c) Deleting Files on a common directory
2. What are the threats to Computer system security?
3. Briefly describe the stages in the Secure system Development Lifecycle.
4. Distinguish between Trust and assurance in Computer Systems Security.
5. What is an Access Control List? How do we obtain access Control List from the Access Control Matrix?
6. When is an Information I said to have confidentiality property with respect to users X?
7. Define Security Levels and Categories. How is the dominance relation used in the definition of the Bell Lapadula model?
8. What is the Simple Security property of the Bell Lapadula Model?
9. What are the constraints for the Biba Model?
10. Compare the Bell Lapadula model and the Biba Model.

**Answer All Questions**

**PART-B** **3 x 10=30 Marks**

11. Provide a sequence of Commands to create an access control matrix with the following users and resources and the associated permissions:
    Users: UserA,UserB,UserC and User D Resources:file1,file2,program1 and process 1. UserA has read and write permission to file1 and read and execute permission to program. UserB and UserC have read permission only to all resources. User D has execute permission to all resources.

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School of Computing
First CIA Exam – Feb 2024
Course Code: INT314
Course Name: Artificial Intelligence and Logical Reasoning
Duration: 90 minutes Max Marks: 50

**Answer all questions** **PART A** **5 x 2 = 10 Marks**

1. You are going to create a login with CAPTCHA. Name the test. Identify the types of intelligence the agent should possess.
2. Tom and Jerry applied 2 different uninformed searching algorithms for a particular scenario. Recall the key measures metrics.
3. Anand developed a medical diagnostic agent to help rural people by diagnosing acute diseases. Identify PEAS of that agent.
4. Define Agent and Rational Agent
5. The environment of automatic car is competitive or cooperative? Analyze.

**Answer all questions** **PART B** **4 x 10 = 40 Marks**

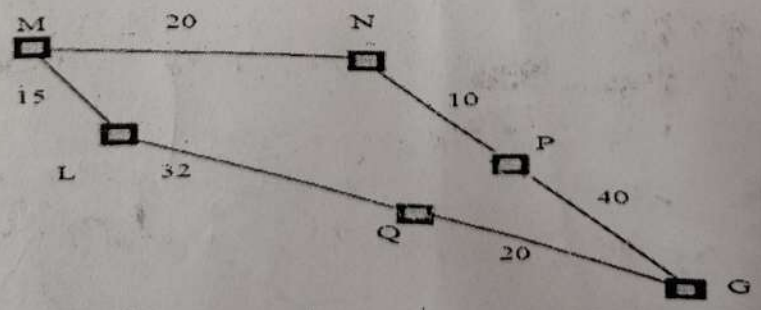
6 a) You are playing time based chess game with an agent. Discuss the type of its environments in which the chess agent is involved. (3)

b) You have to develop an agent to work in a blind environment, Develop the steps of Breadth First Search algorithm to give instruction to the agent to do a task. (7)

7. a) Your friend is in confusion whether to apply BFS or DFS. Select the algorithm for him and Distinguish BFS and DFS (5)

b) Compare the performance metrics of uninformed searching algorithms. (5)

8. The courier delivery bot has to travel in the given state space. The possible states and costs are given in the graph. M-Start, G-Goal. How UCS can be applied and least cost path be found? (10)




9. Chitty is going to develop a model based reflex agent. Help him by constructing the algorithm and block diagram. Give your reasons in building that model. (10)

12 When resources are classified as Top Secret, Secret, Confidential and Unclassified, Justify the "No reads up" and "No writes down" rules of the Bell Lapadula Model. Why does enforcing these rules protect the confidentiality property of the information? Discuss why the "No write up" and "No read down" property of the Biba model will enforce Integrity of the information

13 Discuss the steps in integrating Security in every stages of the System Development Life Cycle.

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School of Computing
Second CIA Test – March 2023
Course Code: IN1313
Course Name: Computer System Security
Duration: 90 minutes Max Marks: 50

**Part-A**
**Answer all the Questions (10 x 2 =20 Marks)**

1. What are the international Standards related to the Computer System Security?
2. Discuss how the Lipner Full Integrity Model is able to combine the "No Read Up, No Write Down" policy of Bell Lapadula Model with that of the "No Write up, No read down" policy of the Biba Model.
3. Let the security labels of User A is (A,Set1) and the security label of User B is (B,Set2). When is User A said to dominate user B based on the security levels?
4. What is the function of Integrity Verification Procedures and Transformation Procedures in the Clark-Wilson Model?
5. When is a system said to be non-interference secure?
6. Give examples for the following: (a) Principle of Least Common Mechanism (b)Principle of Separation of Privilege
7. Distinguish between Users Groups and Roles in Computer Systems
8. What is the purpose of the Domain Name System? What are the attacks on the Domain Name System?
9. Given a statement x:=y, which of the following must be true for information flow to take place? (i) $\underline{x} \leq \underline{y}$ (ii) $\underline{y} \leq \underline{x}$
10. Discuss how isolation of programs can be achieved in Computer Systems.

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**Part-B**
**Answer all the Questions (3 x 10 =30 Marks)**

11. Discuss the following Integrity Policies
    (i) Low Water mark Policy
    (ii) Ring Policy
    (iii) Biba Model
12. Discuss the following terms in relation to the Chinese Wall Model: objects, Company dataset, Conflict of interest class. Discuss the simple security property and the (CW-*)property for the Chinese Wall model. Compare the Chinese Wall and the Clark-Wilson Models
13. What are Covert Channels in Computer Systems? Explain the different types of Covert Channels in Computer Systems with examples. How can Covert Channels in Computer Systems be detected, analyzed and mitigated?

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School of Computing
Third CIA Test – May 2015
Course Code: INT313
Course Name: Computer System Security
Duration: 90 minutes Max Marks: 50

**Part-A**
**Answer all the Questions. (10 x 2 =20 Marks)**

1. What are the phases in the Security Life Cycle?
2. Explain the following X.500 Distinguished Name:
   C=University of California/OU=Davis campus/OU=Department of Computer Science/CN=Matt Bishop
3. Compare Authentication and Nondedectibility properties in Computer systems
4. Explain how a covert channel can be created by using files. What type of covert channel is this?
5. What is Assurance? What are the various types of Assurance?
6. What are viruses? What are the various types of viruses?
7. What is the flaw hypothesis methodology for vulnerability analysis? Given an example
8. What is Auditing? What are the components of the Audit System Structure?
9. What are the components of the Enterprise Security Policy Specification?
10. What are the important components in the security architecture of an Operating System?

**Part-B**
**Answer any two Questions (2 x 10 =20 Marks)**

11. Discuss the following Access Control Models: (i) Discretionary Access Control Model (ii) Role Based Access Control Model (iii) Mandatory Access Control Model.
12. Explain the following Security Policies: (i) Bell Lapadula Model (ii) Chinese Wall Model (iii) Clark-Wilson Model.
13. Discuss the Trusted Computing Security Evaluation Criteria standard. Explain the Functional Requirements, Assurance Requirements, Evaluation Classes and the Evaluation Process.

12

## Part-C

**Answer all the Questions (1 x 10 = 10 Marks)**

14. Consider a private organizational network which hosts a mail server, database server and Web Server. Draw the network organization consisting of the inner firewall, outer firewall and the demilitarized zone. The access to the public web server is done through SSH connection to the Administrative host only. The private network consists of Development Workstations and user workstations.

(i)Discuss the policy for authorizing user access to the servers and Workstations

(ii)Discuss the policy for creating and maintaining passwords for users in the servers and Workstations.

(iii) Discuss the policy regarding secure program development including prevention of Malware

(iv) It is needed to improve the security of this network by installing Intrusion Detection Systems. Discuss the type of IDS and the placement of IDS in the network and how the IDS alerts will be handled

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School of Computing
Third Year B.Tech CSE(CSBS)
Third CIA Test – April 2024

Course Code: INT313
Course Name: Computer System Security
Duration: 90 minutes Max Marks: 50

**Answer All Questions**

**PART A** **10 x2 = 20 Marks**

1. Distinguish between Trust and Assurance in the different phases System Development Life Cycle.
2. What are the various identifiers for identifying files in Computer Systems?
3. What are the conditions that must be satisfied when systems that are non-interference secure are composed to form a new system?
4. What are the types of covert channels that exist in Computer Systems? What are the techniques used to detect covert channels?
5. What is vulnerability analysis? What techniques are used to perform vulnerability analysis?
6. Distinguish between anomaly based and Misuse based intrusion detection techniques.
7. What are the components of the Audit System Structure? What is the function of each?
8. What is the main goal of Computer Forensics? What tools are required to perform Forensic Analysis?
9. What types of security techniques are implemented in Operating Systems?
10. What are the Security goals of Database Systems?

**Answer any two Questions**

**PART-B** **2 x 10=30 Marks**

11. Distinguish between Discretionary access control and Mandatory Access Control in Computer Systems with examples.
12. What are Hybrid Policies? Give an example of a Hybrid Policy. Compare the Chinese Wall Model and Clark Wilson Model for access control.
13. Explain the vulnerabilities in Linux and Windows operating Systems.

**Answer the following Questions**

**PART-C** **1 x10=10 Marks**

14. What is Information Flow? Explain how information flows using Programming language constructs. Discuss the conditions for the information flow to be secure for each of the constructs.