



தேசிய வெளிக்கள நிலையம் தொண்டைமான்

முதலாம் தவணைப் பரீட்சை - 2024

National Field Work Centre, Thondaimanaru.

1st Term Examination - 2024

தகவல் தொடர்பாடல் தொழினுட்பவியல்
ICT

Three Hours

Gr -12 (2025)

20

E

I

Instructions: Part I

- ❖ Answer all questions
- ❖ Write down your index number on the space provided.
- ❖ In each of the questions 1 to 30, pick one of the alternatives (1),(2),(3),(4),(5) which is correct or most appropriate. Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- ❖ No use of calculators.

- Who was the first presenter of the stored program concept?
 1. Von Neumann
 2. Alan Turing
 3. Ada Lovelace
 4. John Presper Eckert
 5. Charlas Barbage
- Which of the following is an example of a 1st generation computer?
 1. IBM7030
 2. IBM 701
 3. PDP – 8
 4. CDC 6600
 5. Apple II
- Which of the following is electrically erasable and reusable non-volatile memory?
 1. EPROM
 2. PROM
 3. EEPROM
 4. DRAM
 5. RAM
- Which of the following memory components will lose data during a power outage or shutdown?
 - A- Main memory
 - B- Read only memory
 - C- Registries
 1. A only
 2. A, B only
 3. A, C only
 4. B, C only
 5. All A, B, C
- Consider the following input devices
 - A. OMR
 - B. MICR
 - C. OCR
 - D. Bar Code Reader
 1. A and B are scanners.
 2. C is used to provide images as input.
 3. A, B, C, D all belong to the type of scanners.
 4. A is used to provide information in checks as input.
 5. B. is used to evaluate multiple choice questions
- Students are expected to enter their date of birth while registering on a website. If data is to be entered in the order YYYY/MM/DD which of the following data validation method is most suitable for this?
 - 1) Format check
 - 2) Range check
 - 3) Length check
 - 4) Limit check
 - 5) Presence check

7. Consider the following statements

A - Taking another's creative work or effort as one's own is plagiarism.

B - Piracy is not a threat to Free Open Source Software (FOSS).

C- Phishing is the act of stealing sensitive information from a person an attempt to obtain malicious intent.

Which of the above statements is most correct?

- 1) A only 2) B only 3) B, C Only 4) A and C only 5) All A, B, C

8. When the computer system is turned on, the tasks of testing the operations of the components connected to the system (POST) and the bootstrap loading (Bootstrap Loader) for the operation of the operating system are carried out by the system

Which of the following is suitable to fill the above blank?

- 1) Register 2) CMOS 3) BIOS 4) RAM 5) Control Unit

9. is an economic and social inequality related to the access, use or impact of information and communication technologies'. Which of the following is suitable for filling the gap?

- 1) Plagiarism 2) Piracy 3) Digital divide
4) Privacy 5) Phishing

10. Which of the following statements is correct regarding the stages about fetch execution cycle?

1. Instructions are decoded by the ALU
2. Program counter is incremented by ALU.
3. Instructions are executed by CU
4. The program counter decodes the instructions to be executed next
5. Instructions are encoded by CU.

11. Consider the following devices

- A. Voice recognition device
- B. Finger print readers
- C. DVD Cam Coder
- D. Iris recognition device
- E. Web Camera

Which of the above is a Biometric device?

- 1) A, B, D 2) A, B, F 3) A, C, F 4) A, B, E 5) All A, B, C, D, E

12. Consider the two binary numbers $S=01101110$ and $R=10101001$. If $T= S \text{ XOR } R$ and $U= S \text{ AND } R$. What will be the values of T and U respectively?

- 1) 10101000, 11000111
- 2) 00000000, 11111111
- 3) 00111000, 10101000
- 4) 10101000, 01010111
- 5) 11000111, 00101000

13. What is the 2's complement of decimal -30?

- 1) 00011110 2) 11100001 3) 11100000 4) 11100010 5) 00011111

14 Find out the value of this. $3AE_{16} + 145_8$

- 1) 1043_8 2) 2023_{16} 3) 413_{16} 4) 2024_{16} 5) 420_8

15. Equivalent value of the following $111_2 \times 111_2$

- 1) 100001 2) 110001 3) 100010 4) 111100 5) 0101111

16. What is the decimal equivalent for 56.5_8

- 1) 46.500 2) 46.125_{10} 3) 46.625 4) 56.50_8 5) 56.250_{16}

17. Find the equivalent value of the following 128.875_{10}

- 1) 10000000.100 2) 1000000.111_2 3) 10000000.110_2
4) 10000000.111_2 5) 11000000.100_2

18. The way that two's complement form of computation occurs respectively for the numbers (-28, -45)

- 1) $(-28) - (+45)$ 2) $(-28) + (-45)$ 3) $(+28) - (-45)$
4) $(-28) + (+45)$ 5) $(+45) - (-28)$

19. If the character "M" is represented as 1001101 in ASCII coding scheme, how "NOR" can be represented in ASCII coding scheme?

1. 1001011 1001011 1001110
2. 1001010 1001001 1001110
3. 1001010 1001011 1001111
4. 1101010 1001011 1001110
5. 1001110 1001111 1010010

20. Which can be considered as universal gates?

- 1) AND, OR 2) AND, XNOR 3) XOR, XNOR
4) NOT, NOR 5) NAND, NOR

21. Find out the MSD, LSD respectively in this following digit 76.0090

1. 7, 9 2. 0, 7 3. 7, 0 4. 9, 7 5. 0, 0

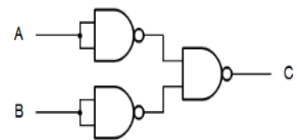
22. Equivalent for this Boolean algebra $\bar{A}(A + B) + (B + A\bar{A})(A + B)$

$$P - \bar{A}B + AB + B \quad Q - B + \bar{A}B \quad R - B \quad S - B(\bar{A} + A + 1)$$

- 1) P, S only 2) P, Q, R only 3) P, Q, R, S only 4) R only 5) P, R only

23. What is the equivalent logic gate for this circuit diagram constructed by using NAND gate.

- 1) NOT 2) NOR 3) AND 4) XOR 5) OR



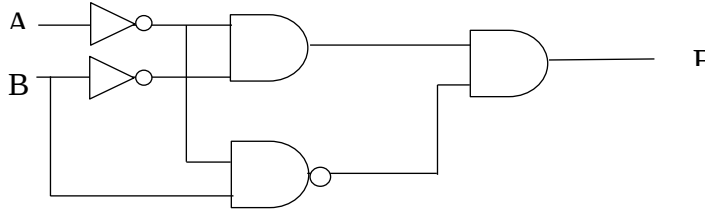
24. Find out the equivalent Boolean algebra for $A \oplus B \oplus C$

- 1) $\bar{A}BC + \bar{A}\bar{B}C + A\bar{B}\bar{C}$
2) $A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C$
3) $\bar{A}BC + \bar{A}\bar{B}C + A\bar{B}\bar{C} + ABC$
4) $A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C + ABC$
5) $A\bar{B} + \bar{A}B + A\bar{C} + \bar{B}C + B\bar{C}$

25. Which of the following is the simplified expression equivalent to $(\overline{A\overline{B}} + \overline{\overline{A}B}) \cdot (A + B)$

- 1) $A\overline{B}$ 2) $\overline{A}B$ 3) $\overline{A} + A\overline{B}$ 4) AB 5) $\overline{A} + \overline{B}$

26. What is the output (F) of the following logic circuit?



- 1) $\overline{A} + \overline{B}$ 2) 0 3) 1 4) $\overline{A} \cdot \overline{B}$ 5) $\overline{A} + B$

27. What is the correct logical expression indicated by this Karnaugh map?

		BC			
		00	01	11	10
A	0	1	0	0	1
	1	1	0	1	1

- 1) $\overline{A}B + AC$ 2) $\overline{B}C + AB$
 3) $\overline{A}B + \overline{C}$ 4) $BC + \overline{A}C$
 5) $AB + \overline{C}$

28. How many valid inputs records in the truth table of NAND based S-R flip flop?

- 1) 0 2) 1 3) 2 4) 3 5) 4

29. Consider the following statements about adders in digital logic circuits

A- Half adder takes two binary digits as inputs.

B- Half adder returns two binary digits as outputs

C - Forming a full adder using two half-complexes can create

Which of the above statements are correct?

- 1) A only 2) B only 3) C only 4) A,B only 5) All A,B,C

30. What is the simplified expression for the following truth table?

A	B	C	F
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

1. $(\overline{A} + \overline{B}) + AC$
 2. $(\overline{A}B) + AC$
 3. $(\overline{A} + \overline{C}) + A\overline{B}$
 4. $AC + AB$
 5. $(\overline{A}C) + AB$



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II(A)

Part -II (A)

01.

- I. Write down the two's complement representing of $(+25_{10})$ using 8 bits. Show your calculations.
.....
.....
- II. Write down the two's complement representing of (-15_{10}) using 8 bits. Show your calculations.
.....
.....
- III. Compute $(25_{10} - 15_{10})$ using the above 8 bits representations. Show your calculations.
.....
.....
- IV. Express the two's complement result obtained in (iii) above in ordinary decimal form.
.....
.....
- V. Mention two advantages of representing data as two's complement type for a computer's operations.
.....
.....

02.

- I. Give the steps of data processing in order?
.....
.....
.....
- II. Mentioning the data collection methods and explain them with an example?
.....
.....
.....
.....
.....

III. Explain the 2 following validity methods and give an example for each?

Length Check

.....

.....

.....

Consistency Check

.....

.....

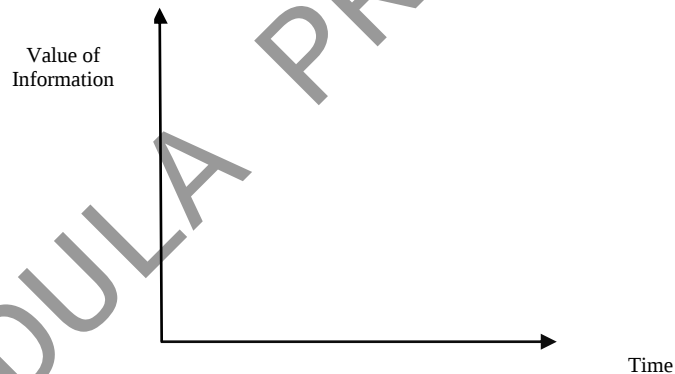
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IV. Differentiate the batch processing and real time processing of data processing methods by giving examples?

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.....

V. Show in the graph how the value of information changes with time?



3.

I. Define the terms volatile memory and non-volatile memory and give an examples for each one?

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II. Define the three types of secondary storage and give 2 examples for each one?

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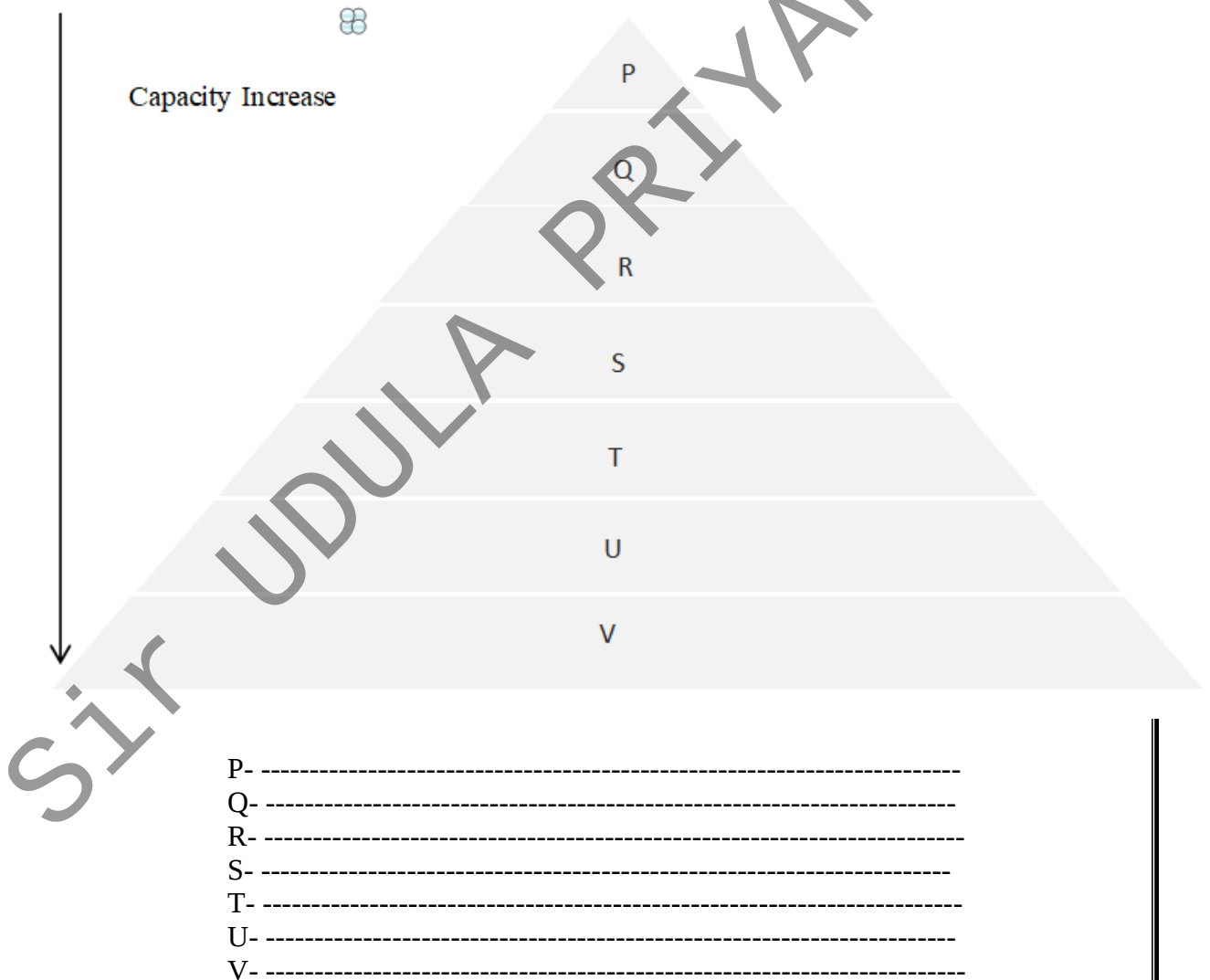
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III. Underline the correct word of characteristics of DRAM and SRAM.

Characteristics	DRAM	SRAM
Access Speed	High / Low	High / Low
Density	High / Low	High / Low
Refresh	Need / No need	Need / No need
Transistor used for a bit	More / Less	More / Less
Used in	Mother board/ Cache or between CPU and Main Memory	Mother board/ Cache or between CPU and Main Memory
Capacity	High / Low	High / Low

IV. Write down the following storage devices in ascending order based on their capacity?

(Magnetic tape, CD, cache memory , Hard disk, RAM, ROM, Memory Register)



4. a.

I. Define the term parallel computing?

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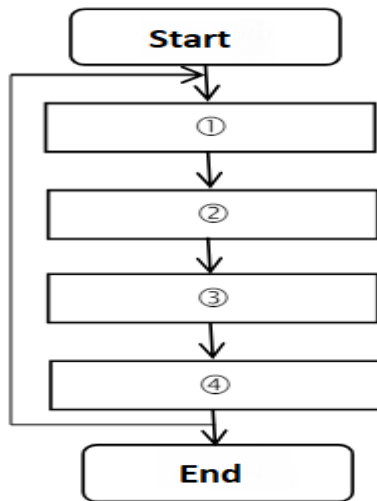
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II. Consider the following incomplete Fetch Execution cycle. Fill the following Fetch Execution cycle diagram by using correct terms given below?

List (Increment the program counter, decoding the fetched instruction, Execution of instruction, fetching the instruction to be executed next)



1.

2.

3.

4.

b. Flip flops are used in electronic circuits to store bits.

1. Construct SR flip flop by using NOR gates?

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.....

11. Explain how bits are stored in Flip flops?

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II(B)

Part - II (B) **Answer two questions only**

01. Consider the following Boolean algebra

$$AB + ABC + A\bar{C}$$

- I. Convert this into standard SOP format?
- II. Give the Karnaugh map (kmap) represent this Boolean algebra?
- III. Simplified the Boolean algebra by using kmap?
- IV. Using the simplified Boolean function in question no III and prepare the logic circuit?
- V. Draw the logical circuit in question III by using NAND gate only?

02.

a. To give Input A, B to the half adder gives the output Sum and Carry

- I. Give the truth table to obtain the output Sum and Carry
- II. Draw the logic circuit for the half adder that the sum and carry are in the same circuit

b. The full adder contains 3 inputs. (A, B, Carry in (C)) It gives the output Sum and Carry.

- I. Give the truth table to obtain Sum and carry?
- II. Having obtained Boolean algebra of Sum and Carry simplify by using kmap?
- III. According to the simplified Boolean algebra in above question II draw the logical circuit of full adder?
- IV. Draw a logic circuit to design a full adder using two half adders?

3.

a. define the term disk partition and give 2 purposes of it?

b. Mention the classification of System Software and give an example for each one

c. Give the 2 functions of BIOS?

d. Write the classification of cloud computing?

e. Define the term Big Data?