

முன்றாம் தவணைப் பரீட்சை - 2025

3rd Term Examination - 2025

Three Hours

Gr -12 (2025)

20

E

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.

1. Which computing device invented by Gottfried Wilhelm Leibniz?

1. Abacus
2. Pasca line
3. Stepped Reckoner
4. Atanasoff-Berry Computer
5. Tabulating Machine

1. Data creation, Processing, Output
2. Data creation, Management, Output
3. Data creation, Management, Removal of obsolete data
4. Data Input, Management, Removal of obsolete data
5. Data Input, Processing, Removal of obsolete data

A: Flash memory – It can be erased/ rewritten by using electricity.
B: Cache memory – It has been prepared by using DRAM technology.
C: Density of SRAM is more than DRAM
D: Refreshing is not required to store data in DRAM.

1. A only 2. A, B only 3. A, C, D only
4. A, B, C only 5. A, D only

1. Slots
2. Sockets
3. Chipsets
4. Clock
5. Bus

1. AGP Slot, CPU Slot 2. Memory Slot, CPU Slot 3. PCI Slot, PCI Express Slot
4. Memory Slot, PCI Slot 5. PCI Slot, Memory Slot

6. Which is correct about fetch cycle?

1. Instructions are decoded by the logical unit
2. Instructions are executed by the control unit.
3. The program counter points to the next instruction to be executed.
4. The program counter is incremented by the logic unit.
5. Instructions are encoded by the control unit.

7. Which of the following respectively describes the services of getting hard disk space for data storage and getting a virtual machine for application installation, execution from a cloud computing service provider?

1. IaaS SaaS
2. SaaS IaaS
3. PaaS IaaS
4. IaaS PaaS
5. PaaS IaaS

8. The attempt to impersonate a trusted entity in electronic communication to obtain sensitive information is called

1. Encryption
2. Copyright
3. Phishing
4. Plagiarism
5. Software piracy

9. With the help of various computers connected in a network, a large task of the main computer is divided into smaller parts and then they are solved simultaneously is known as

1. Cloud computing
2. Distributed Computing
3. Mobile Computing
4. Parallel Computing
5. Grid Computing

10. Which of the following is/are volatile memory?

- A: RAM
 - B: Registers
 - C: CMOS
 - D: ROM
 - E: Cache Memory
 - F: Secondary Storage
1. A, B only
 2. A, B, E only
 3. B, D, E, F only
 4. A, C, D, E, F only
 5. C, D, E only

11. Which is correct regarding L1, L2, L3 caches

- A: L1 cache is inside to the CPU.
- B: Speed order: $L1 > L2 > L3$.
- C: Storage Capacity order: $L1 < L2 < L3$.
- D: All caches are volatile memories.

1. A, B only
2. A, C, D only
3. A, B, D only
4. A, B, C only
5. All the above

12. Correct statement about two's complement?

- A: Perform subtraction as addition.
- B: Efficiency in calculation
- C: Can indicate negative numbers as two's complements

1. A only
2. B only
3. A, B only
4. B, C only
5. A, B, C only

13. What is the decimal value of the two's complement binary 11100010?

1. +36
2. -36
3. -42
4. -30
5. +30

14. Convert the hexadecimal 1D.7F₁₆ into decimal format.

1. 35.374₈
2. 35.376₈
3. 35.350₈
4. 35.360₈
5. 35.132₈

15. Which statement about Von Neumann architecture is correct?

1. Instructions are executed in parallel (parallel execution)..
2. Separate memory is used for storing data and instructions.
3. It contains several processors to execute instructions.
4. It has a Graphics Processing Unit (GPU).
5. Shared memory is used for both data and instructions.

16. What is the result of $101_{16} \times 235_8$

1. 1001110110011101
2. 1001110010001100
3. 1000100010001001
4. 1001110011001001
5. 1001100011011111

17. What is the largest positive and negative numbers in an 8-bit two's complement system respectively?

1. 126, 127
2. 127, 128
3. 127, 126
4. 128, 127
5. 128, 126

18. A document has 512 characters including spaces and line breaks. How many bits are required to represent this document in ASCII code?

1. 512×7
2. $512 / 7$
3. 512×8
4. 512×4
5. 512×16

19. Consider the following statements:

- A. In Combinational Circuits, the output depends only on the current input. It does not have any memory element.
- B. In Sequential Circuits, the output depends not only on the current inputs. It has a memory element.
- C. Half Adder and Full Adder are examples of Combinational Circuits, while Flip Flops are examples of Sequential Circuits.

Select the correct statements.

1. A
2. A,B
3. A,C
4. B
5. All A,B,C

20. Consider the K map given below

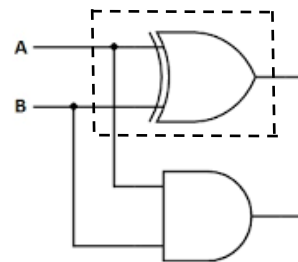
		A			
		n			
C	0				0
	1	0	0		0

What is the correct answer for the above group in K map?

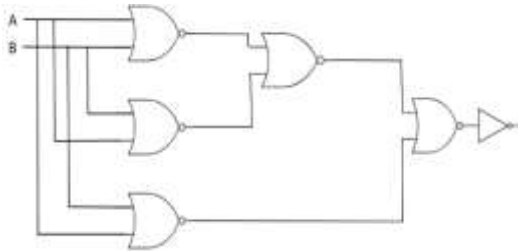
1. $(\bar{A} + C) \cdot (\bar{A} + B)$
2. $(A + \bar{C}) + (\bar{A} + B)$
3. $(A + \bar{C}) + (\bar{A} + \bar{C})$
4. $(A + \bar{C}) \cdot (A + \bar{B})$
5. $(\bar{A} + C) + (\bar{A} + B)$

21. Select the correct statement about the Half Adder:

1. The output of XOR is carry.
2. When the sum is 0, the carry can be either 0 or 1.
3. When the sum is 1, the carry can be either 1 or 0.
4. The dot lines represent the sum of the Full Adder.
5. It has 4 inputs and 2 outputs.



22. Consider this logic circuit with NOR and NOT gates. What could the output be?



1. A
2. 1
3. A+B
4. 0
5. \bar{A}

An Education institute uses several networks and for its one network it is using subnet mask as 255.255.255.240 and one of given host in the particular network IP is 222.1.1.1.

Use the above statement to answer the questions from 23 to 25.

23. What is the class that the IP address of the network belongs to?

1. A
2. B
3. C
4. D
5. E

24. How many subnets belong to above network?

1. 16
2. 60
3. 14
4. 30
5. 32

25. The number of bits allocated for the subnets and hosts in the subnet mask respectively,

1. 8,0
2. 6,2
3. 2,6
4. 4,4
5. 1,7

26. What is the suitable broadcast address for a subnet which the IP address is 192.168.0.1 and subnet mask is 255.255.255.248?

1. 255.255.255.0
2. 192.168.0.7
3. 192.168.0.0
4. 255.255.0.0
5. 192.168.0.1

27. What is the last host IP address of a subnet that contain an IP address 192.168.0.1/27?

1. 192.168.0.30
2. 192.168.0.15
3. 192.168.0.7
4. 192.168.0.63
5. 192.168.0.127

28. What is the Application layer protocol used to transfer a short message

1. SMTP
2. FTP
3. HTTP
4. TFTP
5. TTL

29. What is the method of communication that is used in "Walkie-Talkie"?

1. Simple
2. Half Duplex
3. Full Duplex
4. Parallel
5. None of the above

30. Consider the following statements about information system.

P - Information system could be used to achieve the goals designed for an organization

Q - Information system could be either computerized or manual

R - Banking system may be an example for information system

Which of the above is/are correct?

1. P only
2. Q only
3. R only
4. P and Q only
5. P and R only

31. When transmitting data through a medium, multiple frequencies are used to transmit data together is known as

1. Multiplexer
2. Network Interface Card (NIC)
3. Modem
4. Wi-Fi card
5. Router

32. Which of the following can be considered as an expert system?

1. A bank teller machine
2. A fully automatic washing machine
3. A microwave oven
4. A diagnosis system of a health care facility
5. An electronic blood pressure meter

33. Which scheduler responsible for transferring operations between main memory and secondary memory

1. Long Term Scheduler
2. Mid Term Scheduler
3. Short Term Scheduler
4. Very Long-Term Scheduler
5. Very Short-Term Scheduler

34. Compute the total number of frames in the physical memory of a certain computer with a total capacity of 16GB, where each memory frame has a size of 4kB.

1. 2^{22}
2. $1024 \times 1024 \times 16$
3. 4
4. $2 \times 1024 \times 1024$
5. 2^{24}

35. If any byte of a particular memory space can be addressed by using a 22-bit address and each location can hold one byte, (Byte Addressable) what should be the size of the memory space?

1. 4096 Bytes
2. 10KB
3. 1000KB
4. 4MB
5. 2048 Bytes

36. A section of the file allocation table (FAT) is given below for a given case where the block size of a disk is 4KB, and the blocks of the file al2025.py of 16 KB are also shown. Which of the following is the directory information of the file al2025.py and the final block address of the file al2025.py on disk?

23	-1
24	-1
25	23
26	-1
27	24
28	26
29	25
30	27
31	29

1. 30,24
2. 28,26
3. 31,24
4. 28,23
5. 31,23

37. A process can be moved from the running state to which of the following states?

1. New State, Ready state, Blocked state
2. Ready state , Ready Suspend, Terminated
3. Blocked state, Ready state , Ready Suspend
4. Ready state , Blocked state , Terminated
5. Blocked state , New State, Ready state

38. Consider the following statements.

A-Several processes in a DFD might be executing or working simultaneously.

B-System models and prototypes should be validated for completeness and correctness.

C- DFD is a diagram that represents non-technical details in a system.

Which of the following statements about data flow diagram is/are correct?

1. A Only

2. B Only

3. A and C Only

4. B and C Only

5. All A, B and C

39. Consider the following system implementation methods.

A- Direct

B-Phase

C-Parallel

D-Pilot

Which of the following are best practices for low-risk system implementation?

1. A,B only

2. A,C only

3. C,D only

4. B,C only

5. B,D only

40. Consider the following software development models

A. Waterfall model

B. Spiral model

C. Rapid development model

D. Incremental development model

Which of the above is/are linear models?

1. A only

2. B only

3. B,C only

4. B,C,D only

5. All ABCD



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National Field Work Centre, Thondaimanaru.
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தகவல் தொடர்பாடல் தொழினுட்பவியல்
ICT

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20

E

II(A)

Part -II (A)

01.(A)

i. Give 2 differences between parallel computing and grid computing?

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.....

ii. Explain the term plagiarism and give to methods to avoid plagiarism?

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.....
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.....
.....

iii. Filling the blanks by using the list given below

[John V.Atanasoff, First computer programmer, Turing machine, Analytical Engine, EDVAC, First micro processor, Blaise Pascal, Punch card]

B)

I. John Von Neumann	
II. Intel 4004	
III. Lady Ada Augusta Lovelace	
IV. Dr.Herman Hollerith	
V. Charles Babbage	
VI. Adding machine	

I. Simplify this Boolean algebra by using Boolean laws. $\overline{(A + B)}. (A + AB). C$

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.....
.....
.....

II. Summarize this Boolean algebra using Boolean laws and state the final output logic gate?
 $(A + \bar{B})(\bar{A} + B)$

.....
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.....
.....
.....

02.A)

- I. Write down the two's complement representation of 23, -45 using 8 bits.

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- II. Add 23 and -45 using one's complement method. Show your computations clearly

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- III. Add 23 and -45 using two's complement method. Show your computations clearly

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- IV. How to convert the given two's complements of both positive and negative numbers into decimal numbers? Explain the conversion.

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.....

- V. State two advantages of using two's complement representation for data in internal operations of computer.

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- B) Give the correct bitwise AND operation, bitwise XNOR operation between these 2 binary numbers 10110110_2 , 00110111_2 .

0

AND=.....

XNOR=.....

- C) Write down how decimal number +25 can be represented using single precision IEEE 754 standard. (32 bit) Please specify the calculations?

.....

.....

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.....

03.A) Consider a network with IP address 201.5.19.0 and the subnet mask with 255.255.255.224.

1. Class of the IP address?

.....

2. What is the total number of usable/ hosting IP address?

.....

.....

3. Write the host IP address range?

.....

4. State the broad cast IP address of the above network?

.....

B)

1. A warehousing company known as YARL VANIKAM has decided to completely abandon its old stock management system and implement a computerized system. Give challenges faced by YARL VANIKAM in this implementation?

.....

.....

2. Define functional and non-functional requirements?

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.....

.....

3. Give a disadvantages of the waterfall model as compared to the spiral model.

.....

.....

.....

4. State the software testing (4) methods in order?

.....

.....

04.

A. A program in an operating system can be converted into multiple processes. Is this correct? (Yes No) Explain with proper reason?

.....

.....

.....

B. Name three information found in the process control block(PCB)

.....

.....

.....

C. A computer system uses a virtual address space of 256 KB (18-bit addresses). The physical memory available is 64 KB. The system divides memory into pages, each of size 8 KB.

Answer the following:

(i) How many pages are there in the virtual address space?

.....

.....

.....

(ii) State the page range?

.....

.....

.....

(iii) How many bits are required to store a page number in this address?

.....

.....

.....

D. Answer these questions based on data capacity.

i. 16TB=.....Bits

ii. 0.5MB=.....TB



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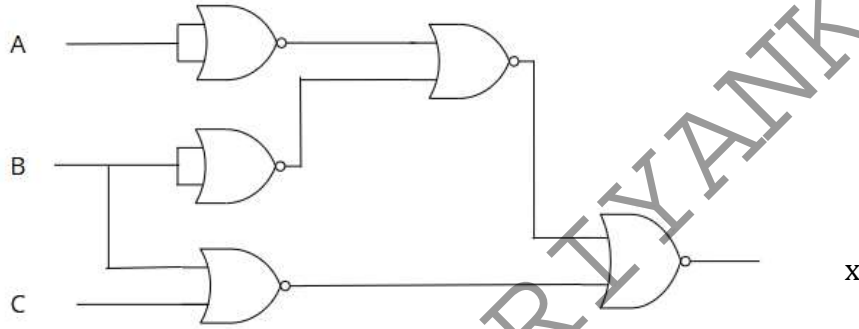
20

E

II(B)

Part - II (B)
Answer two questions only

1. Consider the following logic circuit



- Using Boolean laws and get the output X?
 - Convert the expression obtained in the (1) above into the Standard Sum of Product (S-SOP) form?
 - Simplify the Boolean expression obtained in the (11) using Karnaugh map?
 - Draw the logical circuit obtain in the above (11)?
2. University grant commission has decided to change the manual system of registering the selected applicants of the University for Different Courses into an online university registration system. Applicants have to create a user account in the web site of the University grant commission to apply for the university admission. A message is sent mentioning it, to the applicant's mobile number and the e mail after creating the user account properly. After that, the user can log into the account and the application can be downloaded for the registration.

GCE O/L results and the GCE A/L results of the applicants are also separately displayed in the application from the system. A list of all courses which can be applied according the qualifications and the streams followed by the applicants is displayed. Applicants are allowed to select and remove the courses from that list according to their priority order. And also the priority order can be changed until the closing date of the application. It is believed that the efficient selection of large number of applicants for the suitable courses for different universities in a short period of time with minimum errors could be done using this system. The system allows getting a copy of completed application. As soon as submitting the completed application online, a message is sent to the mobile number

and the e mail of the applicant. An extra selection test is held for some of the courses by each university. An examination fee is charged for it and it can be paid to the university bank account from a branch of a bank.

- I. Define an information system?
- II. Write three advantages of using this information system.
- III. Give three functional requirements in the suggest system.
- IV. Give four non-functional requirements in the suggest system.
- V. State two methods which could be used to pay the examination fee of the applicants for extra selection tests.

3. A)

1. Draw a network connection diagram of a web server (WS), a network printer (NP), switch and 3 host computers (c1,c2,c3) in a star topology?
2. Compare and differentiate TCP and UDP with 2 facts?
3. What is attenuation in data communication? Give an action that can be taken to reduce it.

B) Consider the following scenario.

DAP JAFFNA Company is situated in Jaffna. It connects its five main departments through a computer network.. At this time the DAP Jaffna Head Quarters , Human resource, Information department, External affairs division, Sales division are all integrated by a computer network. Each department is managed by its local area network (LAN) within its own building Computers are assigned to each departmental local area network as given in the table below.

DIVISION	NO OF COMPUERS
DAP JAFFNA HQ	28 + 1 Printer
HUMAN RESOURCE	30
INFORMATION DEP	26
EXT AFFAIRS DIVISION	14
SALES DIVISION	29

An IP block 192.168.10/27 is allocated for this organization's network. IP addresses are to be allocated for all the computers (hosts and servers) of the departments. Five subnets are to be setup for this purpose and this network is connected to a public IP address for the Internet usage of the employees. A firewall is installed for network security and four switches, network cables, application server, proxy server and DHCP server are given to you for this purpose.

1. Writ the subnet mask of the above network?
2. What is the maximum number computing devices that can be connected to a subnet?
3. Fill the table given below?

SUBNET	NETWORK ADDRESS	FIRST USABLE IP	LAST USABLE IP	BROADCAST ADDRESS
DAP JAFFNA HQ				
HUMAN RESOURCE				
INFORMATION DEP				
EXT AFFAIRS DIVISION				
SALES DIVISION				