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Provincial Department of Education - NWP

තෙවන වාර පරීක්ෂණය - 12 ශ්‍රේණිය - 2023
Third Term Test - Grade 12 - 2023

20 | S | I

Index No.: .....

Information And Communication Technology- I

02 hours

Instructions
1. Answer all the questions.
2. Write your index number in the given place of the answer sheet.
3. Read carefully and follow the given instructions in the question paper.
4.Select the correct or most suitable answer from given options (1),(2),(3),(4),(5) for questions from 1 -50.

1. Who is the inventor of Automatic Sequence controlled calculator which is called Mark 1?
(1) Charles Babbage (2) Van Rossum (3) Howard Aiken
(4) Blaise Pascal (5) Ada Augasta Lovelace

2. Which is the **true** expression related to **data** and **information**?
(1) A decision can be made when a large amount of data are available.
(2) The accuracy of information depends on the accuracy of data inserted.
(3) Data should be inserted from multiple sources when inserting data.
(4) Removal of obsolete data is not done as a step of data life cycle.
(5) Although the value of information changes over time they are not subjective.

3. Select the **correct** statement/statements about Big Data.
A. APACHE Hadoop is used as a big data analysis tool.
B. The data generated from social media or large-scale business.
C. The data stored by users in mobile phones.
D. Applicants' databases of national examinations.

(1) Only A is correct (2) Only B is correct (3) Only A and B are correct
(4) Only A,B and C are correct (5) All are correct

4. Select the **correct** answer related to the given statements about data validation methods used when inserting data.
A. In the type check, it is checked whether the inserted data is in required data type.
B. In the presence check, it is tested whether the data type is correct.
C. Range check is used to check whether the data belongs to the required data range.

(1) Only A is correct (2) Only B is correct (3) Only A and C are correct
(4) Only B and C are correct (5) All statements are correct

5. Select the correct answer related to the expressions given about Software Piracy.
A. Copying software which are not protected by copyright laws.
B. Changing software which are protected by copyright laws.
C. Selling software which are protected by copyrighted laws.

(1) A is an instance of software piracy
(2) B is an instance of software piracy
(3) C is an instance of software piracy
(4) A and C are instances of software piracy
(5) B and C are instances of software piracy

6. Which is a feature of computers in fourth generation?
   (1) Using integrated circuits in Very Large Scale Integration (VLSI)
   (2) Starting to use the mouse for first time
   (3) Using PDP (Personal Data Processor)
   (4) They are based on Artificial Intelligence
   (5) Usage of a large number of transistors

7. Select the **correct** statement/statements about computer memory.
   A. Cache memory holds frequently used data and programmes temporarily.
   B. Main memory (RAM) is a static RAM and it refreshes frequently.
   C. The data access speed of Compact Disk is higher than the flash memory and it is suitable for keeping data backups
   (1) A only (2) A and B only (3) A and C only
   (4) B and C only (5) A,B and C all

8. In Random Access Memory modules ……. type of memory is used and it is cheaper than …….. type of memory, which is used in cache memory.
   (1) SRAM,DRAM (2) DIMM,SDRAM (3) RIMM,DIMM
   (4) DRAM,SRAM (5) SIMM,DIMM

9. Fetch Execute cycle is the basic operation process of the computer. Select the answer that shows its correct order.
   A. Decode the instruction
   B. Fetch an instruction from the main memory
   C. Execute the instruction
   D. Store the result in memory
   (1) A,B,C,D (2) B,A,C,D (3) C,D,A,B (4) D,A,B,C (5) A,B,D,C

10. Select the answer that mentions respectively the Most Significant Digit and Least Significant Digit of the number 0.0003850200
   (1) 0 and 0 (2) 0 and 2 (3) 3 and 0
   (4) 3 and 2 (5) 2 and 3

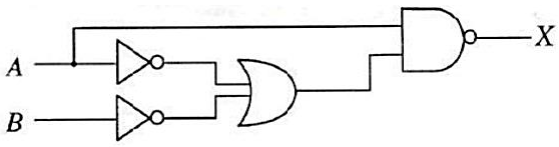
11. Select the hexadecimal equivalent of the number 1336_8
   (1) $2CE_{16}$ (2) $2DE_{16}$ (3) $2DF_{16}$
   (4) $D2E_{16}$ (5) $ED2_{16}$

12. Select the correct Binary equivalent of Decimal 14.625
   (1) 1101.101_2 (2) 1110.110_2 (3) 1101.110_2
   (4) 1110.101_2 (5) 1110.011_2

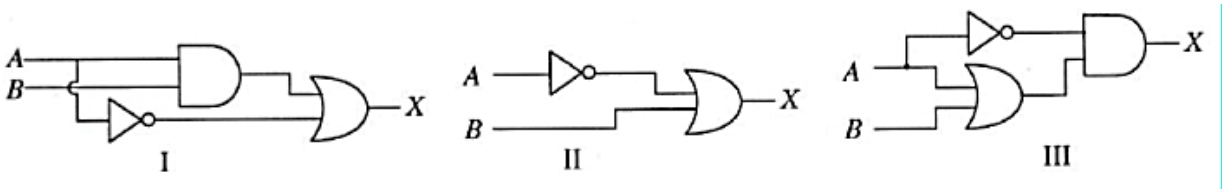
13. What is the correct answer when -27 is represented in 2's complement using 8 bits?
   (1) 11100101 (2) 11100110 (3) 11100100
   (4) 00011011 (5) 00011101

14. Select the answer that mentions respectively the values obtained when performing addition and subtraction operations respectively for numbers 110100_2 and 100001_2 .
   (1) 10011_2 and 1010101_2 (2) 1010101_2 and 10010_2 (3) 1010111_2 and 10011_2
   (4) 1100101_2 and 10011_2 (5) 1010101_2 and 10011_2

15. Consider following logic circuit.

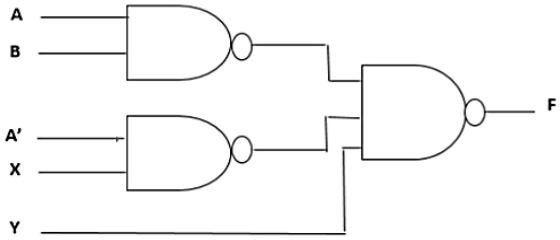


What can be considered as equivalent circuit or circuits for above logic circuit?



(1) I Only (2) II Only (3) III Only
(4) I and II only (5) I,II and III only

16. Following is a logic circuit constructed in NAND gates.



If the expected output of the above circuit is AB + A'B' + C, which variables are represented in X and Y

(1) X=B and Y=C (2) X=B and Y=C' (3) X=B' and Y=C
(4) X=B' and Y=C' (5) X=C' and Y=B

17. Select the result obtained when simplifying following Boolean expression

F=(XZ)'(X'+Z)(Y+Y')

(1) X' (2) Y' (3) X (4) Y (5) XY

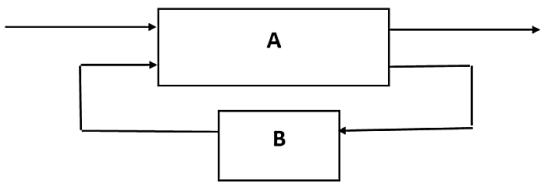
18. Consider the following Karnaugh Map

		AB			
		00	01	11	10
C	0	0	0	0	1
	1	1	1	0	1

Select the Boolean expression that represents the two groups indicated in the Karnaugh Map.

(1) AB' + BC' (2) A'C + AB (3) (A' + C')(A+B)
(4) (A+C)(A'+B') (5) AC + A'B'

19. Following is a diagram of a sequential logic circuit that contains two parts named as A and B



Which of the following statement/statements can be considered as **true** regarding above diagram?

i. Part A is a combinational logic circuit
ii. Part B is a memory element
iii. Only part A can be implemented using logic gates

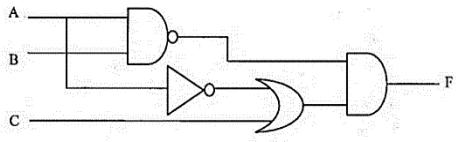
(1) i only (2) ii only (3) i and ii only
(4) i and iii only (5) i, ii and iii all

20. What is the answer obtained when following expression is simplified using De Morgan's Theorem?

$$f(X,Y) = \left(\overline{\overline{X}.\overline{Y}}\right)\overline{(X+Y)}$$

(1) 0 (2) 1 (3) X (4) Y (5) XY

21. Which can be considered as **correct** Boolean expressions related to the following logic circuit?



A. (A+B)'+(A'.C) B. (A'+B'). (A'+C) C. (A+B)'(A.C)' D. (AB)'(A'+C)

(1) A and B only (2) A and C only (3) B and C only
(4) B and D only (5) A,C and D only

22. According to Boolean laws, what is the value of the expression A+1=

(1) 1 (2) A (3) 0 (4) A' (5) A.A

23. Through which component given below, a device controller which controls computer hardware devices interacts with the operating system ?

(1) Essembler (2) Applicaion Software (3) Compiler
(4) Utility softweare (5) Device Driver

24. Which is **not** a main task performed by an operating system.

(1) Process management (2) Security management
(3) Providing user interface (4) Protecting from viruses
(5) Controlling hardware

25. Which from followings converts logical addresses to physical addresses ?

(1) Bus (2) Cache Memory (3) Control Unit
(4) Memory Management Unit (5) Registers

26. Select the procedure of sending a process which is in main memory to the virtual memory?

(1) Paging (2) Swapping (3) Compaction (4) Mapping (5) Fragmentation

27. Consider following expressions given about operating systems

A. System software maintains coordination between hardware, software and the user.
B. Only one operating system can be used in a computer.
C. Booting process can be completed without an Operating System

Which of the above expression/ expressions can be considered as true?

(1) A only (2) B only (3) C only
(4) A and B only (5) A, B and C all

28. Bootstrap Loader is a,
    (1) Anti-virus software
    (2) A programme used to bring operating system to main memory
    (3) A program used instead of BIOS
    (4) A file management software
    (5) An application software

29. "A computer is ready to run even a programmes which exceed main memory capacity''. Which is used by the operating system to perform this functionality?
    (1) Random Access Memory (2) Read Only Memory (3) Cache Memory
    (4) Extended Memory (5) Virtual Memory

30. Consider IP address 192.248.87.3 and subnet mask 255.255.255.224. How many devices can be connected to this network?
    (1) . 16 (2). 24 (3). 30 (4).64 (5). 128

31. What is the function of DNS in a computer network?
    (1) Assigns IP addresses
    (2) Translates domain names to IP address
    (3) Protects a network from viruses
    (4) Provides directing services for the users
    (5) Connects several computer networks together

32. Select the device which can be used to combine two networks having IP addresses as 72.110.0.0 (Subnet mask -255.255.0.0) and 192.248.10.0 (Subnet mask -255.255.0.0)
    (1). Hub (2). Repeater (3). Switch (4). Router (5). Multiplexer

33. Select the **correct** subnet mask from followings.
    (1). 255.255.255.192 (2). 255.0.255.0 (3). 256.255.255.64
    (4). 255.256.255.96 (5). 0.0.0.255

34. What is the correct expression related to MAC addresses?
    (1). Every network device has a unique MAC address
    (2). Every network host has a unique MAC address
    (3). Every network interface has a unique MAC address
    (4). It is assigned when a device is installed
    (5). It is used for routing

35. The First IP address of a network is 192.192.48.0 and the last IP address is 192.192.63.255. What is the subnet of this network?
    (1). 255.255.255.0 (2). 255.255.192.0 (3). 255.255.255.192
    (4). 255.255.240.0 (5). 255.240.0.0

36. A computer of a network has been configured with IP address 192.248.16.91 and subnet mask 255.255.255.128. What is the IP address which cannot be assigned to a device in this network?
    (1). 192.248.16.161 (2). 192.248.16.78 (3). 192.248.16.110
    (4). 192.248.16.75 (5). 192.248.16.120

37. What is the correct expression from followings related to Transmission Control Protocol (TCP).
    (1) TCP is a network layer protocol.
    (2) TCP guarantees that each byte sent is received by the receiver.
    (3) Only one application at a time can use TCP in a computer.
    (4) TCP doesn't guarantee that each byte sent is received at the receiver.
    (5) TCP uses User Datagram Protocol (UDP) as the transport protocol.

38. User Datagram Protocol (UDP) is a …….. layer protocol. Select the suitable term to fill in the blanks in this expression.

(1). Physical (2). Data link (3). Network (4).Transport (5). Application

39. In a Public key encryption system, the Private key of a person is given by the function priv(x) and the public key is given by pub(x). Consider the following statements.

A – pub(x) is used to encrypt a message that can only be decrypted using priv(x).
B – pub(x) is used to sign a message to be sent to x
C – A message encrypted using pub(x) can be decrypted using pub(x)

Which of the above statement/s is/are correct?

(1). A Only (2). B Only (3). C Only (4). A and B Only (5). A and C Only

40. Consider the following expressions given about World Wide Web.

A- It is a collection of hypertext documents connected each other which are accessible through internet.
B- It is a protocol used to distribute information by the computers connected through internet.
C- It has been created by the World Wide Web consortium.

Which can be considered as correct from these expressions ?

(1). A Only (2). B Only (3). C Only (4). A and B Only (5). A and C Only

41. The task of any system can be identified in three types. Select the answer that mentions those tasks correctly.

(1) Input, Storing, Processing (2) Input, Processing, Output
(3) Input, Processing, Output (4) Storing, Processing, Output
(5) Input, Output, Controlling

42. Following expressions are given related to classification of information systems.

A. A closed system receives inputs from external environment to the system
B. An Open system provides output to the external environment of the system
C. Normally, an open system receives inputs within the system only

What is the correct answer?

(1) A only (2) B only (3) C only (4) A and B only (5) A and C only

43. Select an Information System which is mostly used in operational level of an organization.

(1) Executive Information Systems (2) Decision Support Systems
(3) Expert Systems (4) Management Information Systems
(5) Transaction Processing Systems

44. Which of the following can be considered as an Expert System

(1) An ATM of a bank. (2) Automatic break system of a vehicle.
(3) Finger print reading machine. (4) Disease diagnosing system.
(5) Fully automated washing machine.

45. Information system development project team conducted a system analysis and identifies that the system requirements are clear and the system functionalities are not going to be changed during the process. Then it can be concluded that,

(1) A spiral module should be followed.
(2) The system can be developed in waterfall model.
(3) There is a risk level from middle level to high level.
(4) It is required to combine both agile model and spiral model.
(5) The system analysis is an object oriented analysis.

46. The overall costs and benefits analysis in system development is done in,

(1) Technical Feasibility Study
(2) Economical Feasibility Study
(3) Operational Feasibility Study
(4) Organizational Feasibility Study
(5) Transactional Feasibility Study

47. Select the expression which can be accepted related to Structured System Analysis and Design Methodology

(1) System analysis is done in an Object Oriented approach.
(2) Structured methodology is used for system testing.
(3) Proposes a system development methodology covering all stages of system development life cycle.
(4) Project is identified as modules, stages and tasks.
(5) A method used to have a brief understanding about the system.

48. Select the task which is **not** done in System Designing phase

(1) Designing the user interface.
(2) Identification of hardware components for system tasks.
(3) Planning for developing a suitable computer language to develop the system.
(4) Designing databases for the system.
(5) Identifying the sub systems of the system and their dependencies.

49. Select the correct answer related to following expressions which describe about system development life circle.

A. Describes the tasks should be followed in system development.
B. Describe about the requirements of a selected system.
C. Describes about how software development should be done in a selected system.

(1) Only A is correct
(2) A and B are correct
(3) B is correct. A and C are incorrect
(4) Only C is correct
(5) Only B and C are correct

50. Select the correct order of testing a developed system

(1) Integration testing → Unit testing → Acceptance Testing → System Testing
(2) Unit testing → Integration testing → System Testing → Acceptance Testing
(3) Acceptance Testing → System Testing → Unit testing → Integration testing
(4) Unit testing → System Testing → Integration testing → Acceptance Testing
(5) System Testing → Unit testing → Acceptance Testing → Integration testing

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Index No.: .....

Information And Communication Technology- II

03 hours

Answer all questions in part A and select 4 questions from Part B

- **Answer questions in the paper itself for part A**
- **Answers should be provided for questions within the space provided**

Part A – Structured Essay

1. "Tech Lanka" is a well-known business firm in Sri Lanka having branches scattered island wide. This firm requires to grow the service quantitatively and qualitatively furthermore.

   (i) Write three (3) methods to collect data for this purpose

   ……

   ……

   ……

   (ii) Mention three (3) ways to implement above stated data collection methods

   ……

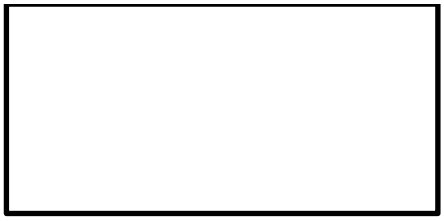
   ……

   ……

   (iii) When analyzing the collected data, many facts related to magnetic tapes and hard disk were identified. Write the data access methods of these devices and represent the data access method in a sketch diagram.

   Magnetic tapes .....

Hard disks .....



(iv) Further, the firm collected data to identify whether there is a relationship between the memory capacity of the devices and the access speed of following devices.

(Hard disk, cache memory, memory registers, compact disks, magnetic tapes, Main memory)

Arrange above devices according to,

a. Increasing order of capacity
b. Increasing order of access speed

According to increasing order of capacity	According to increasing order of access speed
1. …….. 2. …….. 3. …….. 4. …….. 5. …….. 6. ……	1. …….. 2. …….. 3. …….. 4. …….. 5. …….. 6. ……..

2. Answer the questions given below related to process management

(i) Mention two (2) tasks done by the operating system related to process management

……

……

(ii) What is an interrupt?

……

……

(iii) Mention two causes for interrupts

……

……

(iv) What is the data structure that keeps the data required for process management?

……

3.

a. Nimal has given ‘ping’ command using the command prompt of his computer to check the network connection of his computer.

This result of that command was given on the screen as shown below.

```
C:\Users\HP>ping www.ebay.com

Pinging e9428.a.akamaiedge.net [23.77.93.28] with 32 bytes of data:
Reply from 23.77.93.28: bytes=32 time=65ms TTL=54
Reply from 23.77.93.28: bytes=32 time=73ms TTL=54
Reply from 23.77.93.28: bytes=32 time=75ms TTL=54
Reply from 23.77.93.28: bytes=32 time=66ms TTL=54

Ping statistics for 23.77.93.28:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 65ms, Maximum = 75ms, Average = 69ms
```

Answer the questions i, ii, iii and iv using these information

(i) What is the IP address of the server which hosted www.ebay.com website?

……

(ii) What is the class of the IP address obtained when executing the ping command.

……

(iii) Is the connection between Nimal’s computer and the server computer of which the ping command has directed successful or not? Give reasons for your answer.

……

……

……

……

(iv) What is the average round-trip time allocated to execute the ping command

……

b. Following diagram shows the matching between OSI reference model and the TCP/ IP model.

Write the names of layers indicated in letters A, B, C, D, E, F

OSI model	TCP/IP model
Application layer	D
A	
Session layer	
B	E
Network Layer	Internet layer
Data link layer	F
C	

A. ……

B. ……..……

C. ……

D. ……

E. …….

F ……

c. Fill in the blanks indicated from **A** to **F** in the given passage which describes about devices connected to a computer network.

A computer which receives services from a computer network or internet is called a client computer. The computers which provide services for the client computers through a network or internet are called **A**…… .The computers which provides web pages for client devices using http protocol in world wide web are called **B**…… and **C**…… are used for controlling the information flow and ensuring security in the client user's end. **D**…… receives email messages of users and distributes email messages for users. **E**…… dynamically assigns IP address for devices which have not pre-configured IP address. By **F**……. the IP address of a Domain name is provided.

4.

a. Briefly explain following system implementation methods.

i. Direct implementation

……

……

ii. Parallel implementation

……

……

iii. Pilot implementation

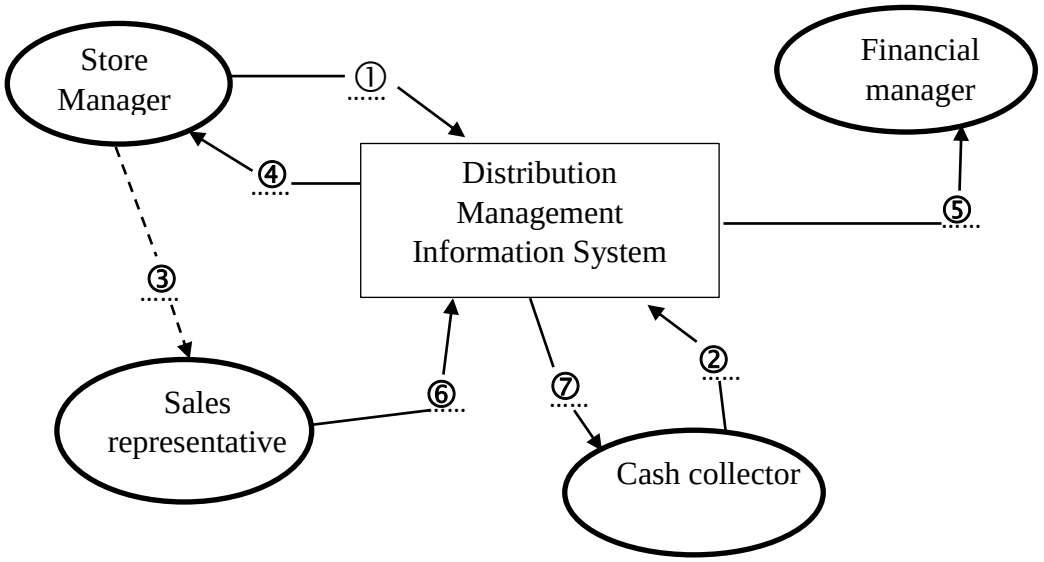
……

……

b. Read the following description and fill in the blanks in the context paradigm provided based on the description.

"Quality products" is a distribution and marketing agency of various household appliances and furniture. It is proposed to develop a distribution management information system to enhance the efficiency of distribution service. Followings are the tasks of that system in brief.

The store manager provides **item list issued for distributions** to the information system and it is given for the sales representative. After that the storehouse manager can obtain the **list of remaining items in the storehouse**. Sales representative provides **sales details** to the information system.
Cash collector receives **sales details** and provides **details about amounts of cash collected** to the system. Financial manager receives **daily income details** from the system and puts those details into a file.



①…… ⑤……

②…… ⑥……

③…… ⑦……

④ ……

Part - B

Answer only 4 questions

5.

a.

i. Briefly describe Batch Processing and Real Time Processing with an example for each, processing types.

ii. Name the types of cloud computing services and give an example for each service.

b. Describe what is volatile memory and non-volatile memory. Mention three memory devices for each type of memory.

6. A factory owner has decided to develop a special circuit to inform the security staff when there is a fire occurred at night in the factory building. For this circuit, a smoke sensor (A), Thermal sensor (B), and a flame sensor (C) are used.

When at least two of these sensors are activated (logical state - 1) an alarm (F) is activated (logical state 1).

i. Draw a truth table that shows the functionality of this system.

ii. Write the Boolean expression that indicated the states of activation and deactivation of alarm.

iii. Simplify the Boolean expression obtained in part – ii using a Karnaugh map.

iv. Draw a circuit diagram using logic gates for the simplified Boolean expression.

v. Draw another circuit diagram using only a suitable universal gate for the simplified Boolean expression.

7.

a. Following is an incomplete truth table of a half adder

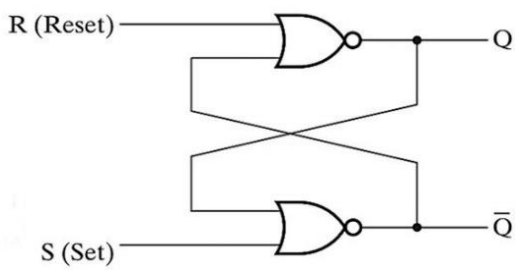
A	B	Carry	Sum
0	0		
0	1		
1	0		
1	1		

(i) Complete Carry and Sum columns of the truth table.

(ii) Draw a circuit diagram to represent the half adder.

(iii) Briefly explain the function of the full adder.

b. Following is a circuit diagram of a SR Latch. An incomplete truth table of SR Latch also given. Fill in the blanks in A,B and C rows and rewrite the truth table.



S	R	Q	$\overline{Q}$	
1	0	….	…	← A
0	0	1	0	
0	1	0	1	
0	0	….	….	← B
1	1	….	….	← C

8. a.

(i) An Embedded system uses 32 bit address to access its main memory. What is the maximum amount of main memory accessible? Show your calculations clearly. Assume that memory is byte addressable.

(ii) Select the most suitable entry in the second and third column corresponding to the properties in the first column of the following table with respect to FAT 32 and NTFS file system

	FAT32	NTFS
P. Maximum file size	Limited/ Unlimited	Limited/ Unlimited
Q. Maximum file name length	Limited/ Unlimited	Limited/ Unlimited
R. Security	Yes/ No	Yes/ No
S. Support of Unicode	Yes/ No	Yes/ No

b. (i) Draw a process states transition diagram representing primary process states and additional process states

(ii) Briefly describe the function of following schedulers in process scheduling.

P. Short term scheduler

Q. Mid term scheduler

R. Long term scheduler

c. (i) Briefly describe the process of Contiguous Allocation of disk space for files

(ii) Mention a drawback of Contiguous Allocation

9. a. In the ACB Company there are four departments called Production, Marketing, Administration and HRM. To construct the computer network in subnets 192.168.10.0/24 IP addresses is used. Assume that each department is located in separate buildings. Following table shows the number of computers used by each department in the network.

Subnet Number	Department Name	Number of Computers
SN 01	Production	40
SN 02	Marketing	50
SN 03	Administration	60
SN 04	HRM	48

(i) Write the first IP address and the last IP address of the given IP address range.

(ii) Write the subnet mask of the given IP address as a dotted decimal number.

(iii)Write the subnet mask suitable to create subnets

(iv) Complete following table using the subnet mask you obtained

Subnet number	Subnet mask	Network address	Broadcast address	Usable first IP address	Usable last IP address

b. It is expected to obtain internet facility for the four subnets of ACB company through the IT division using the IP address 192.248.154.0/24 provided by an internet service provider. In the IT division, there is a web server and a proxy server. In addition, there is a printer connectable to network, and a firewall used to protect internal networks.

(i) Write the subnet mask to construct the computer network of the IT division.

(ii) Assume that there is an Application server to provide software services, Layer 3 switch, Four (4) Layer 2 switches and cables. Drew a complete network diagram which connects all subnets. (Important: computers and other devices can be represented as square shapes and name them clearly)

10.

a. A list of requirements of a proposed system is given below. Separate the functional requirements and non-requirements from the list and write the letters that indicate the requirement.

System – An online information system that facilitates the users to find job opportunities and apply for jobs.

A. The system shall be able to provide the user a list of employment opportunities of which there are vacancies to apply.

B. The system interface should be visible effectively in any device such as smartphone or tablet computer.

C. The system shall be able to provide the user the details of each job

D. The user shall be able to apply online for a selected company using the system.

E. The data of users should be secured even when there is a system failure.

F. Using the system a same applicant shall be able to apply for many job opportunities.

G. The system shall be able to provide facility for each user to create separate user accounts.

H. The user shall be able to download a pdf copy of the applications submitted.

I. The user shall be able to update the application details submitted or remove the submitted application.

J. Any popular web browser should be able to render the interface of the information system.

K. The system should be developed within a period of one month.

L. The client's feedback should be considered in each stage of the system development.

b. Following is a description of tasks in a company. Represent it in a Level-I Data Flow Diagram.

"Day Outing Kithulgala" is a company that provides facilities for its customers to spend their vacations in an interesting way.

- There is a customer services assistant and a manager to work on official tasks.
- Customer services assistant works on customer inquiries and package reservations.
- The manager works on customer's payments and providing services.
- In the company, all documents and data files are maintained manually.
- Customers inquire about the details of services provided by the company from the customer services assistant. Then the customer services assistant provides service package details for customers referring package details file.
- If the customer wants to order a package, package order details are provided to the customer services assistant
- Customer services assistant keep those package order details in the package orders file
- To confirm the package order, the customer deposits an advance in the bank and gives the cash deposit details to the manager. Manager obtains the package order details of that particular customer using the package orders file, prepares the order confirmation report and gives it to the customer.
- In addition, the manager inserts details about new package details to the package details file.

20 S I

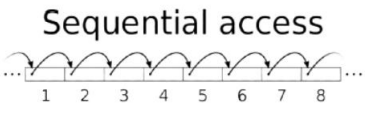
Third Term Test - Grade 12 – 2023

Information Communication Technology - Answers

Paper - I

Question	Answer	Question	Answer	Question	Answer	Question	Answer	Question	Answer
1	3	11	2	21	5	31	2	41	2
2	2	12	4	22	2	32	4	42	2
3	3	13	1	23	5	33	1	43	5
4	3	14	5	24	4	34	3	44	4
5	2	15	4	25	4	35	2	45	2
6	1	16	4	26	2	36	1	46	2
7	1	17	1	27	1	37	2	47	4
8	4	18	4	28	2	38	4	48	4
9	2	19	3	29	5	39	1	49	1
10	4	20	1	30	2	40	1	50	2

Paper - II Part - A

1	I.	Questionnaire, Interviews, Studying samples , Prototypes			1.5 marks
	II.	Manual, Automated , Semi-automated			1.5 marks
	III.	Magnetic tapes	Sequential Access		4 marks
		Hard disk	Random Access		
	IV.	Increasing order according to capacity Registers , Cache Memory , Main Memory , CD , Magnetic tapes, Increasing order according to access speed Magnetic tapes ,CD ,Main Memory, Cache Memory , Registers			1.5 x 2 = 3 Marks

2	I.	• Allocating system resources, such as CPU time, memory, and input/output devices, to running processes. • Scheduling the execution of processes in a way that maximizes system throughput and minimizes response times. Give marks for any suitable answer	4 Marks
	II.	Interrupt is an event that alters the sequence of execution of process.	1 Mark
	III.	**Hardware interrupt** A hardware interrupt is an electronic signal from an external hardware device that indicates it needs attention from the OS. **Software interrupts**	4 Marks

		A software interrupt occurs when an application program terminates or requests certain services from the OS. • Interrupt can occur due to a time expiry an OS service request I/O completion. Give marks for a suitable answer	
	IV.	Process Control Block	1 Mark

3	a	i	23.77.93.28	1x4 = 4 Marks
		ii	Class A	
		iii	Successful, All four packets which are forwarded to the computer 23.77.93.28 from Nimal's computer have been received. No packet loss.	
		iv	69ms	
	b		A. Presentation Layer B. Transport Layer C. Physical Layer D. Application Layer E. Transport layer F. Network Access Layer	0.5x6 = 3 Marks
	c		A. Server computer B. Web Server C. Proxy Server D. Mail Server E. Dynamic Host Configuration Server F. Domain Name Server	0.5x6 = 3 Marks

4	a	i	The old system is removed and the new one put in its place without any overlap or limited roll out.	1x4 = 4 Marks
		ii	Allows both the old and new systems to be used simultaneously for a limited period of time.	
		iii	A subset of the organization known as a pilot group starts using the new system before the rest of the organization.	
	b		1. item list issued for distributions 2. details about amounts of cash collected 3. item list issued for distributions 4. list of remaining items in the storehouse 5. daily income details 6. sales details 7. sales details	0.5x6 = 3 Marks

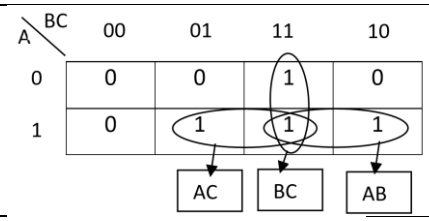
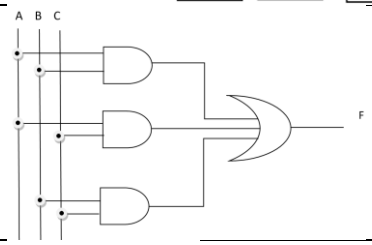
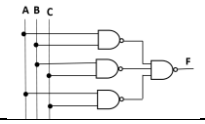
Paper II Part -B

5	a	i	**Real-Time Processing** • Data is processed in almost real time. • It has lower latencies since data is processed immediately. • Completion time is critical. • It has higher cost per unit of data. • It supports interactivity since processing occurs in real-time. E.g. defense application systems like as RADAR **Batch Processing** • Data is processed in batches. • It has high latencies since data is processed in batches. • Completion time is not critical. • It has lower cost per unit of data. • It lacks interactivity since processing occurs in batches. E.g. Monthly Salary Processing system	5 Marks
		ii	Iaas – Google Drive,sky drive Saas-Google docs, Office 365 word Paas -Google app Engine, windows azur	5 Marks

	b			2.5 X2 = 5 Marks

Volatile Memory	**Non-Volatile Memory**
computer memory that requires power to maintain the stored information Main Memory Registers Cache memory	computer memory that can retain stored information even after power is removed Hard Disk Flash Memory DVD

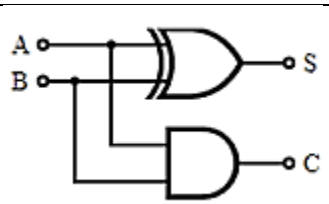
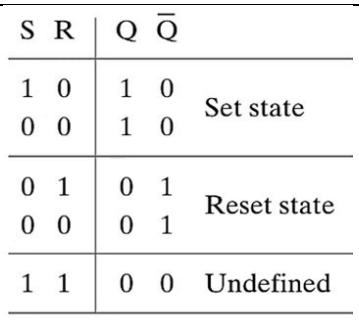
6

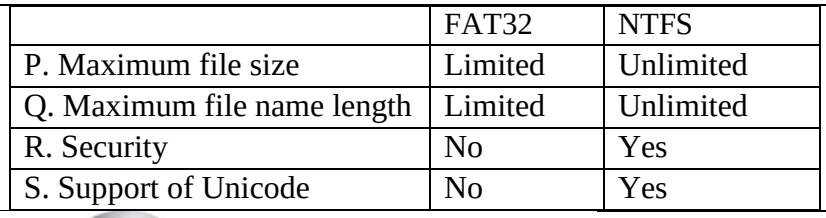
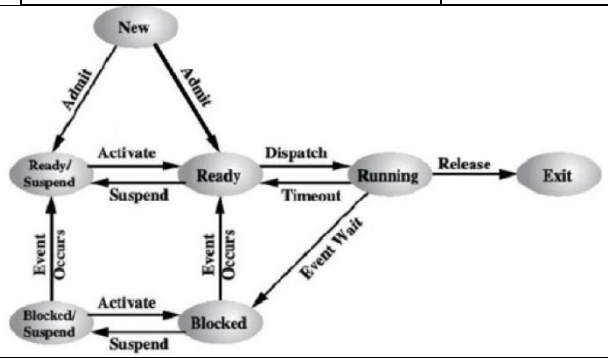
6	i		3 Marks
	ii	A'BC + AB'C + ABC' + ABC	2 Marks
	iii		3 Marks
	iv		3 Marks
	v		4 Marks

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

7	a	i		4 Marks
		ii		3 Marks

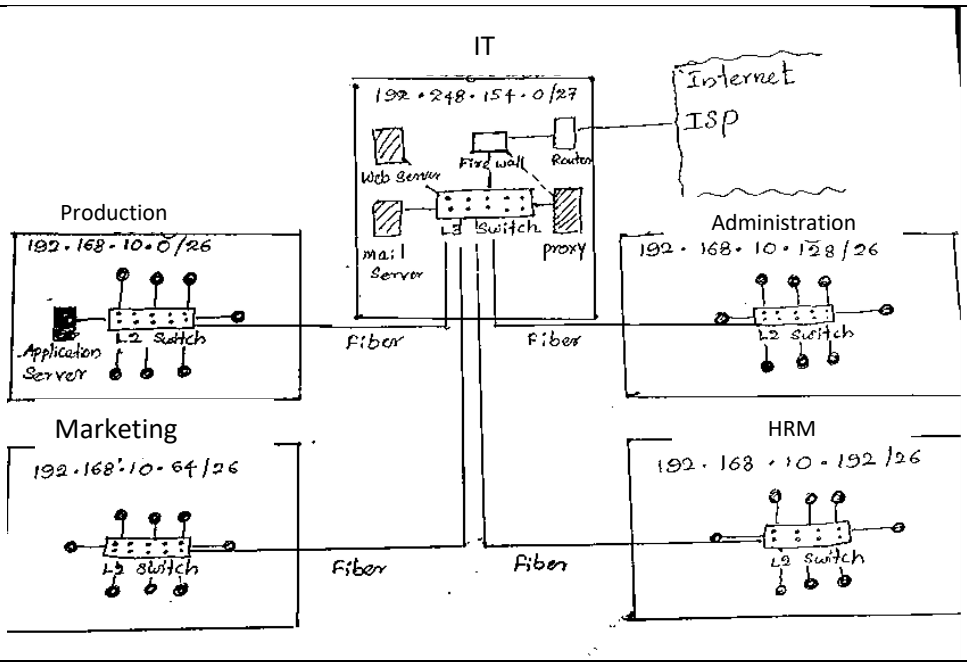
A	B	Carry	Sum
0	0	0	0
1	0	0	1
0	1	0	1
1	1	1	0

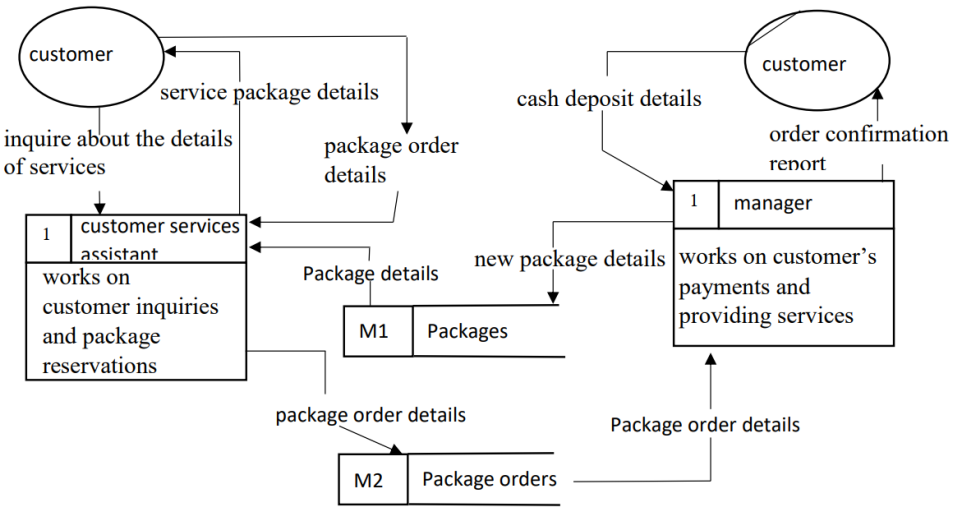
				
		iii	Full Adder is the adder which adds three inputs and produces two outputs.	2 Marks
	b			6 Marks

8	a	i	2^{32} = 4GB	1 Mark
		ii		4 Mark
	b	i		4 Marks
		ii	**P. Short term scheduler** Short term selects those processes that are ready to execute. **Q. Mid term scheduler** Medium term is a process of swapping schedulers **R. Long term scheduler** selects the processes from the pool and loads them into memory for execution.	1x 3 = 3 Marks
	C	i	Allocate disk space as a collection of adjacent/contiguous blocks	2 Marks
		ii	• Extending file size is difficult • External fragmentation (free unusable space between allocation)	1 Mark

9	a	i	First Address- 192.168.10.0 Last Address- 192.168.10.255	0.5x2 = 1 Mark
		ii	255.255.255.0	1 Mark
		iii	255.255.255.192	1 Mark
		iv		4 Mark

Subnet	Subnet Mask	Network Address	Broadcast Address	Usable IP (First)	Usable IP(last)
SN01	255.255.255.192	192.168.10.0	192.168.10.63	192.168.10.1	192.168.10.62
SN02	255.255.255.192	192.168.10.64	192.168.10.127	192.168.10.65	192.168.10.126
SN03	255.255.255.192	192.168.10.128	192.168.10.191	192.168.10.129	192.168.10.190
SN04	255.255.255.192	192.168.10.192	192.168.10.255	192.168.10.193	192.168.10.254

	b	i.	255.255.255.224	1 Mark
		ii.		2.5 X2 = 5 Mark

10	a	i	Functional Requirements - A,C,D,F,G,H,I, Non functional requirements - B,E,J,	5 Mark
	b			10 Mark