



**General Certificate of Education (Adv. Level) Examination**  
**Fourth Term - 2021**  
**Conducted by Field Work Center (FWC), Thondaimanaru**  
**Information & Communication Technology (ICT)**

தகவல், தொடர்பாடல் தொழினுட்பவியல் I  
**Information & Communication Technology I**

Two Hours

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Gr. 13 (2021)

**Instructions**

- ❖ Answer all questions.
- ❖ Write down your index number on the space provided.
- ❖ In each of the questions 1 to 50, 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 of the following has the fastest data accessing speed?

- (1) Register
- (2) Cache memory
- (3) Hard disk
- (4) Flash drive
- (5) Main memory

2. Which of the following is a block containing memories and secondary storage device found in ascending order from left to right?

- (1) Cache memory, Main memory, Register, Harddisk
- (2) Main memory, Register, Cache memory, Harddisk
- (3) Harddisk, Register, Cache memory, Main memory
- (4) Register, Cache memory, Main memory, Harddisk
- (5) Register, Cache memory, Harddisk, Main memory

3.  $AB9_{16}$  is equivalent to.

- (1)  $7612_8$                       (2)  $7651_8$                       (3)  $5271_8$                       (4)  $5432_8$                       (5)  $4532_8$

4. Two's complements of  $9_{10}$  and  $(-6)_{10}$  are respectively.

- (1)  $00000110_2, 11110111_2$                       (2)  $10000110_2, 10010111_2$                       (3)  $11000110_2, 11100111_2$   
 (4)  $11100110_2, 11100011_2$                       (5)  $00001001_2, 11111010_2$

5. The area containing the addresses of the next instruction to be brought into the central processing unit is called.

- (1) Program Counter (PC)                      (2) Arithmetic Logic Unit                      (3) Control Unit  
 (4) Register                      (5) Main memory

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6. Which of the following is a valid subnet mask?

- (1) 0.255.0.255 (2) 0.255.0.0 (3) 255.255.255.240  
 (4) 0.0.0.255 (5) 255.255.0.256

7. Which of the following is an equivalent to the Boolean expression  $\overline{(A \cdot B)} \cdot \overline{(A + B)} \cdot C$  ?

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

8. Which of the following can be considered as part of a data definition language (DDL)?

- (1) SELECT (2) INSERT (3) UPDATE (4) ALTER (5) DELETE

9. Consider the following statements about operating system.

- A - Scheduling processes
- B - Allocating and resolving memory required for processes
- C - Protecting computers from virus infections

Which of the above is /are the functions of operating system?

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

10. Consider the following statements about memory technologies.

A - Static Random Access Memory (SRAM) is more expensive than Dynamic Random Access Memory (DRAM)

B - Dynamic Random Access Memory is used as a technology for register

C - Static Random Access Memory is more speed than Dynamic Random Access Memory

Which of the above is /are correct?

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

11. Which of the following statement is true?

- (1) Ada Augusta Lovelace is considered as first computer programmer
- (2) Pascaline developed by Blaise Pascal reads data by punch card
- (3) Pascal was able to do calculations such as addition, subtraction and multiplication
- (4) John Von Neumann designed analytical engine
- (5) Difference engine was developed by Blaise Pascal

12. What is the value of Python statement  $5 // 2^3 + 2$  ?

- (1) 3 (2) 7 (3) 2 (4) 8 (5) 1

13.  $456_{16} + 27_{16} =$

- A -  $2175_8$
- B -  $10001111101_2$
- C -  $47D_{16}$

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

14. Which of the following can be functional requirement of online hotel room reservation system?

- (1) Visitors shall be able to reserve the room
- (2) Users should be able to have an easy user interface to operate without further training
- (3) Availability of the room should be able to be displayed before it is reserved
- (4) System should be able to have fast response time (e.g. less than 3 seconds)
- (5) System should be able to be secure in order for members' data to be protected

15. In computer networks, which of the following is the function of IMAP (Internet Message Access Protocol)?

- (1) Monitoring network devices in the Internet
- (2) Helping users in order to receive e-mail messages from mail server
- (3) Sending e-mail messages to the mail server
- (4) Transferring files from one computer to another in the Internet
- (5) Routing data packets in the Internet

16. Which of the following is characterized by a double line rectangular symbol in entity relationship (ER) diagram?

- (1) Strong entity
- (2) Derived attribute
- (3) Weak entity
- (4) Multi-valued attribute
- (5) Identifier attribute

17. Consider the followings.

- A - Amplitude
- B - Frequency
- C - Phase
- D - Wave length

Which of the above is /are the properties of a signal?

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

18. Consider the followings.

- A - Latency
- B - Bandwidth
- C - Attenuation
- D - Topology

Which of the above is /are the properties of a signal transmission media?

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

19.  $19.625_{10} =$

- (1)  $10011.101_2$
- (2)  $11001.101_2$
- (3)  $10100.100_2$
- (4)  $11001.111_2$
- (5)  $10011.110_2$

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20. Consider the following statements.

A – DNS server maps domain names into corresponding IP addresses

B – DHCP server caches recently accessed webpages

C – FTP server allocates IP addresses to the network devices automatically

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

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

21. Which of the following information is not generally contained in the process control block (PCB) of an operating system?

- (1) Process number
- (2) Capacity of hard disk
- (3) Process scheduling state
- (4) Program counter
- (5) Process state

22. In computer networks, “UDP (User datagram protocol) is functioning in ..... layer of OSI network reference model”.

Which of the following is appropriate to fill the blank in?

- (1) Physical
- (2) Transport
- (3) Network
- (4) Datalink
- (5) Application

23. Which of the following is the order of testing performed during software development from left to right?

- (1) Integration testing, user acceptance testing, unit testing, system testing
- (2) Unit testing, system testing, user acceptance testing, integration testing
- (3) Integration testing, system testing, unit testing, user acceptance testing
- (4) System testing, user acceptance testing, unit testing, integration testing
- (5) Unit testing, integration testing, system testing, user acceptance testing

24. Which of the following(s) is /are the characteristic(s) of UDP (User Datagram Protocol) in comparison with TCP (Transmission Control Protocol)?

- A - Connection-oriented
- B - Low overhead
- C - Guaranteed delivery
- D - Unreliable service

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

25. “The primary key field values of a table in a relational database do not contain repetitive values”.

What type of integrity constraint is this?

- (1) Entity integrity constraint
- (2) Referential integrity constraint
- (3) Domain integrity constraint
- (4) Attribute integrity constraint
- (5) Domain integrity constraint

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26. “Public key encryption is also called .....”.

Which of the following is most appropriate to fill the blank in?

- (1) Private key encryption
- (2) Textual encryption
- (3) Digital encryption
- (4) Symmetric encryption
- (5) Asymmetric encryption

27. Consider the following “Customer” data table.

CustomerID	CustomerName	Address	ContactNo
CU_01	V.Ramanan	Jaffna	0212226547
CU_02	M.N.Perera	Colombo	0112334545
CU_03	K.Nishobikha	Kandy	0776577359
CU_04	A.M.H.Asraf	Jaffna	0767837387

In this table, which of the following SQL statement can be used to change the address of a customer to “Colombo” who has the **CustomerID** ‘CU\_01’?

- (1) UPDATE Customer SET Address='Colombo';
- (2) UPDATE Customer Address='Colombo' WHERE CustomerID='CU\_01';
- (3) UPDATE Customer SET Address='Colombo' WHERE CustomerID='CU\_01';
- (4) INSERT Customer SET Address='Colombo' WHERE CustomerID='CU\_01';
- (5) SELECT Customer UPDATE Address='Colombo' WHERE CustomerID='CU\_01';

28. Which of the following is not a part of microprocessor?

- (1) Instruction register
- (2) Program counter
- (3) Cache memory
- (4) Main memory
- (5) Control unit

29. Which of the following is a logical operator in Python programming?

- (1) \*
- (2) OR
- (3) %
- (4) <=
- (5) //

30. Consider the following statements about software process models.

- A – Tasks are divided into time slices in order to provide specific features for a release
- B – This is an iterative approach with software development being provided after each iteration. Each release has an incremental development and the final product will have all the functionalities requested by the user
- C – Gaining user experience in software from the very beginning of the software development

Which of the above can be considered as the characteristics of the agile process model?

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

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31. Consider the following Boolean function.

$$f(A,B,C) = A.B + A.C + B.C$$

What is the minimum number of NAND gates required if the above Boolean function is implemented by using NAND gates only?

- (1) 2                      (2) 3                      (3) 4                      (4) 5                      (5) 6

32. Consider the following statements.

A – Python is a fourth generation computer programming language

B – Programs written in second generation computer programming language do not required translators to be executed on a computer

C – Programs written in first generation computer programming language are required translators to be executed on a computer

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

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

33. “In OSI reference model, transport layer contributes ..... communication”.

Which of the following is most appropriate to fill the balnk in?

- (1) Process to process  
(2) Node to node  
(3) Source to destination  
(4) Router to switch  
(5) Hop to hop

Consider the following “Order” table to answer the questions 34 and 35.

This data table contains the order details for the items. Each order is carried out on a specific date and it contains different items in different quantities.

**Order**

<u>OrderNo</u>	<u>ItemNo</u>	<u>Description</u>	<u>Date</u>	<u>Quantity</u>
1	12	Screw	6/1/2015	100
1	15	Bolt	6/1/2015	50
2	7	Flange	2/2/2015	10
2	15	Bolt	2/2/2015	40
2	12	Screw	2/2/2015	80

34. Which of the following is correct about this table?

- (1) It is in zero normal form (0NF)  
(2) It is in first normal form (1NF)  
(3) It is in second normal form (2NF)  
(4) It is in third normal form (3NF)  
(5) Data are not enough to determine its normal form

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35. Which of the following group of tables will be obtained when the above table is converted to the next normal form?

- (1) Order (OrderNo, Date), Item (ItemNo, Description)
- (2) Order (OrderNo, Date), Item (ItemNo, Description, Quantity)
- (3) Order (OrderNo, Date, Quantity), Item (ItemNo, Description)
- (4) Order (OrderNo, Date), Item (ItemNo, Description), Order\_Item (OrderNo, ItemNo, Quantity)
- (5) Order (OrderNo, Date), Item (ItemNo, Description, Quantity), Order\_Item (OrderNo, ItemNo)

36. In operating system, consider the following statements about SPOOL (Simultaneous Peripheral Operations On Line).

- A – It is a buffer that holds the output for peripherals such as printer
- B – It is a special area of memory or hard disk
- C – It is accessible by input-output devices

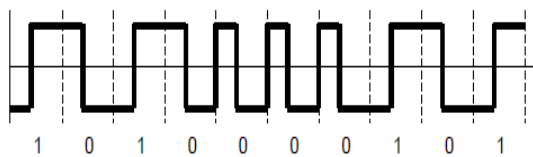
Which of the above statement(s) is /are incorrect?

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

37. In software development, which of the following statement about waterfall model approach is incorrect?

- (1) It is most appropriate for the software development with clear and stable user's requirements
- (2) The user gets to experience the software only after it has been fully developed
- (3) It is difficult to adopt changing user's requirements
- (4) It can be proceeded to the next step only after completing the previous step
- (5) It is an iterative model

38. In data communication, consider the following signal encoding scheme used to be encoded the data '1010000101'.



Which of the following encoding scheme is used to be encoded by this diagram?

- (1) NRZ                      (2) NRZ-I                      (3) Manchester                      (4) RZ                      (5) NRZ-L

39. What is the simplified Boolean expression given the following Karnaugh map?

		<b>BC</b>			
		00	01	11	10
<b>A</b>	0	1	0	0	1
	1	1	1	0	1

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

40. Which of the following is an invalid Python variable?

- (1) `_x_y`                      (2) `xy`                      (3) `x_y`                      (4) `x2`                      (5) `2x`

41. Consider the following statements about computer malware.

A - Computer virus replicates itself and spreads from one computer to another.

B – Trojan horse first seems to be useful to the user before it is installed on the computer and steals useful information once installed.

C - Computer worm replicates itself and spreads from one computer to another using the computer network without user intervention.

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

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

Consider the following scenario to answer questions for 42 and 43.

In a computer network, If a machine is assigned an IP address of 192.248.16.132 and a subnet mask of 255.255.255.192:

42. What is the CIDR notation of this subnet mask?

- (1) /24                      (2) /32                      (3) /25                      (4) /16                      (5) /26

43. How many maximum of IP addresses can be assigned to machines in this network?

- (1) 126                      (2) 14                      (3) 30                      (4) 62                      (5) 6

44. Consider the following statements.

A – GNU / Linux is a proprietary operating system

B – MS-Windows is an open source operating system

C – Open source software offers the user greater freedom of use, modification, and sharing

Which of the above is /are correct?

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

45. Which of the following is the order of the life cycle of the data processing?

A – Input

B – Collection

C – Process

D – Storage and output

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

46. Consider the Uniform Resource Locator (URL) <https://www.edupub.gov.lk>. What is the domain name of this URL?

- (1) `www`  
(2) `.lk`  
(3) `http`  
(4) `edupub.gov.lk`  
(5) `https`

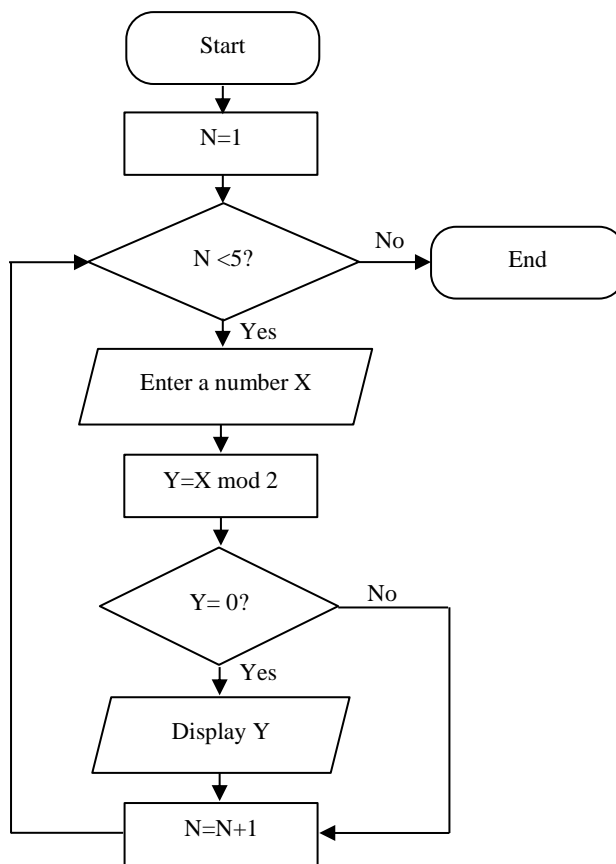
47. Which of the following testing strategy will concern the internal implementation of the system?

- (1) Blackbox testing  
(2) Whitebox testing  
(3) Integration testing  
(4) Acceptance testing  
(5) Unit testing

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48. What is the output of 100, 70, 81, 77 and 84 as consecutive user inputs for the following flowchart?



- (1) 81,77    (2) 100,70,81,77,84    (3) 77,84    (4) 100,70,84    (5) 100

49. What will be the output when using  $Y = 1$  instead of  $Y = 0$  in the flow chart given above in (48)?

- (1) 81,77    (2) 100,70,81,77,84    (3) 77,84    (4) 100,70,84    (5) 100

50. Consider the following statements about computer network connectivity devices.

A - It uses protocols to find the best routes while sending data packets between at least two computer networks.

B - It is a data packet forwarding device that filters data packets between segments of a local area network and operates within the data link layer of the OSI reference model.

C - It provides a common connection point for devices on the network while copying incoming data packets to all other ports.

The most suitable devices for A,B and C are respectively.

- (1) Router, Switch, Hub  
 (2) Router, Hub, Switch  
 (3) Switch, Hub, Router  
 (4) Hub, Router, Switch  
 (5) Hub, Switch, Router

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[end