



Information & Communication Technology ICT தகவல் தொடர்பாடல் தொழினுட்பம் Information & Communication Technology ICT தகவல் தொடர்பாடல் தொழினுட்பம் Information & Communication Technology ICT தகவல் தொடர்பாடல் தொழினுட்பம் Information & Communication Technology ICT தகவல் தொடர்பாடல் தொழினுட்பம்

**G.C.E. (A/L) Examination – October 2021**

**Information & Communication Technology (ICT)**

**Conducted by the Department of Education – Northern Province**

தகவல் தொடர்பாடல் தொழினுட்பவியல் I  
Information & Communication Technology I

Time:  
Two hours

20

E

I

**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. “..... carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output operations specified by the instructions”.

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

- (1) Main memory                      (2) CPU                      (3) Cache memory                      (4) Register                      (5) ROM

2. Consider the following statements.

- A – Decoding Instructions
- B – Transferring output
- C – Fetching Instructions

Which of the above is /are the step(s) of fetch-execute cycle?

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

3. Consider the following statements.

- A computer program that operates or controls a particular type of device that is attached to a computer.
- It provides a software interface to hardware devices.

Which of the following(s) is /are the most appropriate term to represent the above characteristics?

- (1) Device driver                      (2) BIOS                      (3) CMOS                      (4) IRQ                      (5) EPROM

4. Consider the following statements.

- A – Files could be accessed via the Internet from anywhere
- B – Lower software cost
- C – Data privacy /security issues

Which of the above is /are considered as the advantage(s) of the cloud computing?

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

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5. “.....is a response by the processor to an event that needs attention from the software”.

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

- (1) POST            (2) ALU            (3) Program counter    (4) CU            (5) Interrupt

6. If  $A = 10100010_2$  and  $B = 11101010_2$ , what would be the value of A OR B?

- (1)  $11101110_2$     (2)  $11100010_2$     (3)  $11101010_2$     (4)  $00101010_2$     (5)  $10001010_2$

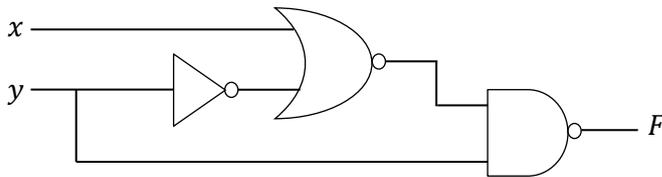
7. Two’s complement of  $(-8_{10})$  and  $(11_{10})$  are respectively.

- (1)  $10011000_2, 00001011_2$     (2)  $11111000_2, 01101011_2$     (3)  $11101000_2, 00101011_2$   
 (4)  $11101000_2, 00010011_2$     (5)  $11111000_2, 00001011_2$

8. The simplified result of the Boolean expression  $\overline{(\bar{A} + B) + A + B + C}$  would be.

- (1) 1            (2) 0            (3) A            (4) B            (5) C

9. Consider the following logic circuit.



Which of the following(s) is /are the equivalent Boolean expressions of the output F of this logic circuit?

- A -  $(x + \bar{y}) + \bar{y}$             B -  $\bar{x}y + \bar{y}$             C -  $\bar{x} + y$   
 (1) A only    (2) B only    (3) A,B only    (4) A,C only    (5) A,B,C all

10. Consider the following Karnaugh map.

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

Which of the following simplified Boolean expression is represented by the Karnaugh map given above?

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

11. Consider the following functions about operating system.

- A – Managing process control block
- B – Allocation of address space to processes
- C – Managing page and segment
- D – Swapping

Which of the above is /are the functions of memory management?

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

**12.** Consider the following statements related to operating system .

A – System initialization

B – Execution of a process

C – A user request to create a new process

Which of the above is /are the four principal events that cause processes to be created?

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

**13.** Which of the following is a disadvantage of disk partitioning?

(1) Efficient retrieval of files

(2) Separation of the operating system and program files from user files

(3) Use of multi-boot setups in computer

(4) Increases disk fragmentation

(5) Increases the total space

**14.** The operating system maintains a page table for each process and the virtual page number is used as an index into the page table to find the entry for that virtual page. Which of the following is not included in a page table entry?

(1) Frame number

(2) Valid and invalid bit

(3) Page fault

(4) Referenced bit

(5) Modified bit

**15.** Consider the IP address 192.16.5.133/29. How many bits are needed to identify the network and host respectively?

- (1) 29, 3            (2) 28, 3            (3) 30, 2            (4) 28, 4            (5) 29, 4

**16.** Which of the following(s) is /are correct regarding TCP?

A – Reliable data transmission

B – Connection-oriented

C – Guaranteed delivery

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

**17.** Which of the following(s) is /are correct regarding optical fiber cable?

A – Very lower attenuation

B – Higher bandwidth

C – More immune to electro magnetic interference

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

**18.** Which of the following function is related to the presentation layer of the OSI network reference model?

(1) Flow control

(2) MAC addressing

(3) Data encryption

(4) Error control

(5) IP addressing

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19. Consider the followings.

- A – Authentication
- B – Non-repudiation
- C – Message Integrity
- D – Availability
- E – Access control

Which of the above can be considered as the essential security services in an online communication?

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

20. Consider the following incomplete paragraph.

In the ... ①..... the same key is used to encrypt and decrypt the data. This is similar to using the same key to lock and unlock a door lock. In contrast, .....②..... uses two keys, one key as the .....③..... or the public key and the other key as the .....④..... or the private key. This method is more practical compared to the first method.

Which of the following is correct to fill the blanks in from ① to ④.

- (1) ① public key encryption, ② secret key encryption, ③ decryption key, ④ encryption key
- (2) ① secret key encryption, ② public key encryption, ③ decryption key, ④ encryption key
- (3) ① secret key encryption, ② encryption key, ③ public key encryption, ④ decryption key
- (4) ① public key encryption, ② secret key encryption, ③ encryption key, ④ decryption key
- (5) ① public key encryption, ② encryption key, ③ secret key encryption, ④ decryption key

21. Consider the following statements related to software process models.

- The functional modules are developed in parallel as prototypes and the final product is made by integrating them enabling a rapid delivery
- If requirements are well understood, its process enables a development team to create a ‘fully functional software’ within very short time period

Which of the following software model satisfies the above statements?

- (1) Waterfall model
- (2) Rapid application development (RAD) model
- (3) Spiral model
- (4) Object-oriented model
- (5) Agile process model

22. Consider the following statements about software development.

- A - Adopting new user’s requirements
- B - Correcting errors in the software after implementation
- C - Identification of user’s requirements and the limitations of the present system

Which of the above is/ are correct related to software maintenance?

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

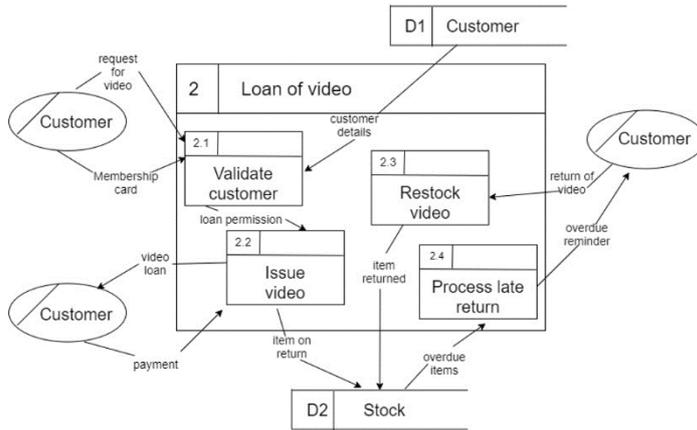
23. Consider the following statements.

- A – The response time of the system should be faster (eg. Less than 5 seconds) when reserving for a book
- B – The system should be able to give security for the members’ data
- C – Members of Library shall be able to search for the availability of books

Which of the above can be functional requirement(s) of an online library system?

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

24. Consider the following segment of a dataflow diagram (DFD) about video rental system.



A – DFD represents the process model

B – Level 1 DFD can be decomposed further in order to obtain level 2 diagram

C – This DFD represents level 2 diagram

Which of the above is/ are correct?

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

Consider the following relational database tables to answer questions 25 and 26.

*Book (Book\_ID, Title)*

*Publisher (Publisher\_ID, Publisher\_Name, Contact\_Number)*

*Book\_Publisher (Book\_ID, Publisher\_ID)*

A publisher may publish many books and a book may be published by more than one publisher.

Where Book\_ID and Publisher\_ID are the unique attributes of the Book and Publisher table respectively.

25. Which of the following is correct statement?

- (1) Publisher\_ID is the primary key of the Book\_Publisher table  
 (2) Book\_ID is the primary key of the Book\_Publisher table  
 (3) Publisher\_ID is the foreign key of the Publisher table  
 (4) Values of Publisher\_ID in the Publisher table may be null  
 (5) Book\_ID is the part of the primary key of the Book\_Publisher table

26. Which of the following is correct statement?

- (1) Only the Book table is in third normal form  
 (2) Only the Publisher table is in third normal form  
 (3) Only the Book and Publisher tables are in third normal form  
 (4) Only the Book and Book\_Publisher tables are in third normal form  
 (5) All the tables are in third normal form

27. Consider the following SQL statements (assume that all the tables and fields are given).

A - SELECT \* FROM Customers WHERE Country IN ('Sri Lanka', 'Australia', 'India');

B - SELECT \* FROM Products WHERE Price BETWEEN 50 AND 100;

C - SELECT COUNT(CustomerID), Country FROM Customers GROUP BY Country;

Which of the above is/ are syntactically correct?

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

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28. Consider the following tasks about database.

- I - Modifying the existing records in a table
- II - Adding columns to an existing table
- III - Deleting existing records in a table
- IV - Removing the table in database

Which of the following correctly indicate the SQL command in order from I to IV required for each of the above tasks?

- (1) Alter, Update, Delete, Drop
- (2) Update, Alter, Drop, Delete
- (3) Drop, Update, Alter, Delete
- (4) Delete, Update, Alter, Drop
- (5) Update, Alter, Delete, Drop

29. Consider the following three statements about integrity constraints used in relational database.

- ① - If a foreign key exists in a table, the foreign key value must match a primary key value of records in another table
- ② - No attribute of a primary key can be null
- ③ - Every attribute has its associated set of data

①, ② and ③ are respectively.

- (1) Entity integrity, referential integrity, domain integrity
- (2) Referential integrity, entity integrity, domain integrity
- (3) Domain integrity, referential integrity, entity integrity
- (4) Referential integrity, domain integrity, entity integrity
- (5) Entity integrity, domain integrity, referential integrity

30. Consider the following three symbols for the attributes used in an entity-relationship diagram.



The types of attributes ①, ② and ③ are respectively.

- (1) Derived attribute, identifier attribute, multi-valued attribute
- (2) Multi-valued attribute, identifier attribute, derived attribute
- (3) Identifier attribute, multi-valued attribute, derived attribute
- (4) Identifier attribute, derived attribute, multi-valued attribute
- (5) Multi-valued attribute, derived attribute, identifier attribute

31. Consider the following Python program.

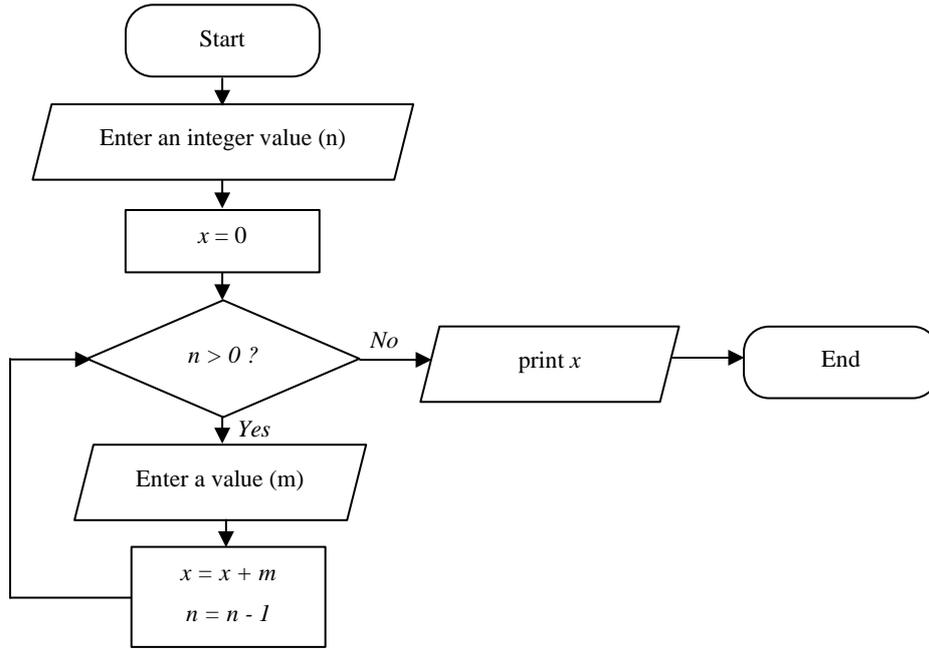
```
def myfunc1():  
    x = 2  
    def myfunc2():  
        nonlocal x  
        x = 4  
        myfunc2()  
    return x  
print(myfunc1())
```

What would be the output of this program when it is executed?

- (1) 4
- (2) 42
- (3) 24
- (4) 2
- (5) error message



36. Consider the following statements about the algorithm given by the flowchart below.



- A – If  $n = 0$ , the output would be also 0
- B – If  $n$  obtains negative values, algorithm will not generate any output
- C – If  $n = 2$ , algorithm expects three inputs further

Which of the above is /are correct regarding this algorithm?

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

37. Which of the following Python program(s) is / are equivalent to the algorithm given in (36) above.

**I**

```

n = int(input('Enter a number:'))
x = 0
while n > 0:
    m = int(input('Enter a number:'))
    x = x + m
    n = n - 1
print(x)
  
```

**II**

```

n = int(input('Enter a number:'))
x = 0
for i in range(n):
    m = int(input('Enter a number:'))
    x = x + m
    n = n - 1
print(x)
  
```

**III**

```

n = int(input('Enter a number:'))
x = 0
while True:
    m = int(input('Enter a number:'))
    x = x + m
    n = n - 1
    if n < 0:
        break
print(x)
  
```

- (1) I only            (2) II only            (3) III only            (4) I,II only            (5) I,II,III all

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38. What would be the output if the following Python program is executed?

```
x = ""
for i in range(1, 10):
    if i % 2 == 0:
        x = str(i) + x
print(x)
```

- (1) 13579                      (2) 246810                      (3) 2468                      (4) 8642                      (5) 97531

39. Which of the following Python statement about text file handling is invalid?

- (1) f = open ("file1.txt", "rt")                      (2) f = open ("file1.txt", "r")                      (3) f = open ("file1.txt", "x")  
(4) f = open ("file1.txt", "rt")                      (5) f = open ("file1.txt", "j")

40. Consider the following statements about computer programming.

- A – Python is an object-oriented programming language  
B – First and second generation programming languages are collectively called “High-level programming languages”  
C – Compiler translates and executes source code into machine code one instruction at a time

Which of the above is / are correct?

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

41. Which of the following HTML code segment is used to insert a video clip on a webpage?

- (1) <video width="300" height="240" controls>  
    <source src="movie.mp4" type="video/mp4">  
    </video>  
(2) <audio width="300" height="240" controls>  
    <source src="movie.mp4" type="video/mp4">  
    </audio>  
(3) <play width="300" height="240" controls>  
    <source src="movie.mp4" type="video/mp4">  
    </play>  
(4) <embed width="300" height="240" controls>  
    <source src="movie.mp4" type="video/mp4">  
    </embed>  
(5) <run width="300" height="240" controls>  
    <source src="movie.mp4" type="video/mp4">  
    </run>

42. Which of the following HTML code can be used to insert an inline frame on a webpage?

- (1) <inlineframe href="demo.html" height="200" width="300" title="display"></inlineframe>  
(2) <frameset src="demo.html" height="200" width="300" title="display"></frameset>  
(3) <frame src="demo.html" height="200" width="300" title="display"></frame>  
(4) <iframe src="demo.html" height="200" width="300" title="display"></iframe>  
(5) <frames href="demo.html" height="200" width="300" title="display"></frames>

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43. Consider the following CSS declaration.

```
p
{
    margin: 95px 50px 75px 100px;
}
```

In the above CSS code, the order of 95px 50px 75px 100px are respectively from left to right is.

- (1) right, bottom, left, top                      (2) top, bottom, right, left                      (3) top, right, bottom, left  
(4) left, top, right, bottom                      (5) left, right, top, bottom

44. Consider the following CSS code segment.

```
<html>
<head>
<style type="text/css">
    .intro
    {
        background-color: yellow;
    }
</style>
</head>
<body>
<h1> Welcome to My Homepage </h1>
<div class="intro">
    <p id="firstname"> Kamalasingham </p>
    <p id="hometown"> Jaffna </p>
</div>
<p> Selectors </p>
</body>
</html>
```

Which of the following statement is correct regarding this CSS code?

- (1) Background color yellow is applied to the text “Welcome to My Homepage” only  
(2) Background color yellow is applied to the text “Kamalasingham” only  
(3) Background color yellow is applied to the text “Jaffna” only  
(4) Background color yellow is applied to the text “Selectors” only  
(5) Background color yellow is applied to the text “Kamalasingham” and “Jaffna” only

45. Consider the followings about PHP.

- A – It is a server-side scripting language  
B – It can be used for making dynamic and interactive web pages  
C – Its code is executed on a web server  
D – It is an open source scripting language

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

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

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46. Consider the following PHP script.

```
<?php
$scars = "audi";

switch ($scars)
{
  case "volvo":
    echo "Your favorite car is volvo.";
    break;
  case "audi":
    echo "Your favorite car is audi.";
  case "honda":
    echo "Your favorite car is honda.";
    break;
  default:
    echo "Your favorite car is neither volvo, audi, nor honda";
}
?>
```

What would be the output if the above PHP script is executed on a web browser?

- (1) Your favorite car is audi
- (2) Your favorite car is honda
- (3) Your favorite car is audi. Your favorite car is honda
- (4) Your favorite car is volvo
- (5) Your favorite car is volvo. Your favorite car is audi. Your favorite car is honda

47. Which of the following statement(s) is / are correct about shopping cart software used in e-commerce applications?

- A – It enables customers to select goods and then make a payment
- B – It can be used as a goods-order management tool
- C – It calculates the sales amount, sales tax, discount, etc. automatically

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

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

48. Consider the followings about software agents.

- A – They always interact with other agents
- B – They can operate without the direct intervention of humans
- C – They are able to exhibit goal-directed behavior by taking the initiative

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

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

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**49.** Consider the followings.

- A – Swam intelligence
- B – Neural network
- C – Genetic alogorithm

Which of the above can be the application of artificial intelligence (AI)?

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

**50.** Consider the following applications based on information and communication technology.

- A - Helping to improve the care for patients and the prevention of critical conditions in high-risk patients
- B - A significant amount of data can be obtained on the stages of the soil in research
- C - Collecting and sharing data from vehicles through applications for traffic monitoring

Which of the above can be the application(s) of IoT (Internet of Things)?

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

\*\*\*\*

[End