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

தகவல், தொடர்பாடல் தொழினுட்பவியல் I Information & Communication Technology I	*Two Hours* Gr. 13 (2021)	20	E	I

Part - 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. Which of the following devices can be used to read the answers marked as shaded circles in a multiple-choice question paper?
(1) Digitizer (2) Plotter (3) Lightpen (4) Scanner (5) MICR

2. Which of the following statement is true about computers which were developed in the past?
(1) Transistors were used in first generation computers
(2) Assembly language was used as a programming language in first generation computers
(3) Vacuum tubes were used in second generation computers
(4) Integrated circuits were used in third generation computers
(5) Assembly code cannot be executed in third generation computers

3. Which of the following statements is **false** with respect to the CPU?
(1) Cache memory holds data that can be readily accessed by the CPU
(2) ALU and CU are two principal parts of the CPU
(3) Control Unit sends signals to the CPU components to perform sequenced operations
(4) ALU determines which actions are to be carried out according to the values in a Program Counter (PC) register and a status register
(5) ALU operations are controlled by the CU

4. "……. is an economic and social inequality with regard to access to, use of, or impact of information and communication technologies".
Which of the following is the most appropriate to fill the blank in?
(1) Plagiarism (2) Piracy (3) Digital divide (4) Privacy (5) Phishing

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5. Consider the following statements.

A - Source code is available and it is free to use, modify or redistribute these type of software

B - Source code is not available and user should have the permission given by owner of the software to use this type of software

C - It is given to users always in free of charge

Which of the above is /are considered correct about open source software?

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

6. What is the decimal value of the binary number 0.010101?

(1) $5/64$ (2) $13/64$ (3) $17/64$ (4) $21/64$ (5) $31/64$

7. Which of the following is equivalent decimal value of Two's complement value of 11000110?

(1) -85 (2) -58 (3) -56 (4) -78 (5) -68

8. Consider the following statements.

A - Latches and flip-flops are the basic elements for storing information

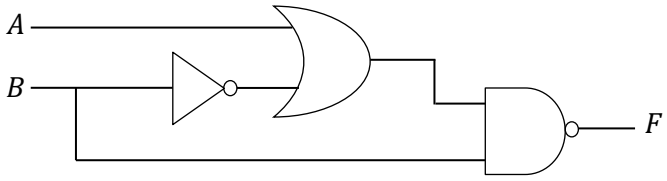
B - SR flip flop has two outputs one output being the inverse or complement of the other, and two inputs

C - SR flip flop is designed with the help of two NOR gates and also two NAND gates

Which of the above is /are correct?

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

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 - $(\overline{A + \bar{B}}) + \bar{B}$

B - $(\bar{A} + B) + \bar{B}$

C - $(\overline{A.B})$

(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.

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

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

(1) $(A + \bar{B})(\bar{B} + C)$

(2) $AB + BC + \bar{A}\bar{B}$

(3) $(A + B)(B + C)(\bar{B} + \bar{C})$

(4) $BC + AB + A\bar{C}$

(5) $(\bar{A} + C)A + B)$

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11. In operating system, with ……①……. , only one process can execute at a time; meanwhile all other processes are waiting for the processor. With ……②……. , more than one process can be running simultaneously each on a different processor.
Which of the following is most appropriate to fill the blanks in ① and ② respectively?
(1) Multiprocessing, Multiprogramming
(2) Multiprogramming, Uniprocessing
(3) Multiprogramming, Multiprocessing
(4) Uniprogramming, Multiprocessing
(5) Multiprogramming, Uniprocessing

12. In operating system, what is a page fault?
(1) It is an spelling error in a page in memory
(2) It is a reference to a page which is in another program
(3) It always occurs whenever a page is accessed
(4) It is an access to a page not currently in memory
(5) It always occurs whenever a page is accessed

13. A process is selected from the ……. queue by the …….. scheduler, to be executed.
(1) Blocked, short term
(2) Wait, long term
(3) Ready, short term
(4) Ready, long term
(5) Waiting, medium term

14. What is waiting time?
(1) The total time in the blocked and waiting queues
(2) The total time spent in the ready queue
(3) The total time spent in the running queue
(4) The total time from the completion till the submission of a process
(5) The total time spent for the booting up

15. Consider the following statements about fiber optics table.
A - It contains very lower attenuation
B - It contains very lower usable bandwidth
C - It contains more resistance for electro magnetic interferences
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

16. The amplitude modulation technique is used to change only.
(1) The amplitude
(2) The frequency
(3) The phase
(4) The frequency and phase only
(5) The amplitude, frequency and phase

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17. Consider the following table.

No.	Characteristics
❶	Unreliable
❷	Connection-oriented
❸	Unordered messages
❹	No congestion control

Which of the above can be the characteristic(s) of UDP?

(1) ❶❹only (2) ❸❹only (3) ❶❷only (4) ❷❹only (5) ❶❸❹only

18. Which OSI layer performs code conversion, code formatting and encryption?
(1) Presentation
(2) Session
(3) Network
(4) Application
(5) Physical

19. Which of the following application layer protocol that uses UDP as the transport protocol?
(1) HTTP (2) DNS (3) SMTP (4) HTTPS (5) POP

20. Which of the following is correct about data encryption?
(1) It is the process of correctly identifying the parties involved in a communication by each party
(2) In secret key encryption, two different keys are used to encrypt and decrypt data
(3) In public key cryptography, each public party is given a separate key to encrypt data
(4) Private key cryptography is more practical than public key cryptography
(5) Reversed usage of keys in public key encryption enables digital signature

21. Which of the following would be functional requirement of a students information system for a private tuition institute?
(1) System should have user-friendly interfaces
(2) Teachers should be able to evaluate online tests
(3) Students should be able to edit the teaching materials
(4) System should withstand user errors
(5) Student login has to be expired after one year

22. Which of the following is incorrect statement about off-the-shelf software in comparison with custom software?
(1) Software is designed to the exact user's requirements
(2) Changes or maintenance can be made quickly
(3) More reliable because off-the-shelf software is well tested before its been sold
(4) Less expensive
(5) Too many features, most are not used by users

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23. Consider the following three statements related to software process models.

- Customer satisfaction by early and continuous delivery of valuable software
- Adapting changing requirements, even in late development
- Delivering working software frequently (for example, monthly)

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

24. Consider the following statements.

A - Context diagram in a DFD illustrates a systems interface to the business and outside world including other information system

B - DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored.

C - DFD represents data model of a system

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 relations to answer the questions from 25 to 27.

teacher (teacher_id, teacher_name, date_of_birth, author_id)
book(book_id, book_name)
author (author_id, author_name, email_address)
authorOfbook(author_id, book_id)
publisher(publisher_id, publisher_name, contact_number, email)
publisherOfbook(publisher_id, book_id)

Where teacher_id, book_id, author_id and publisher_id are the unique attributes of the teacher, book, author and publisher relations respectively.

25. Which of the following is correct statement about the relations given above?

(1) teacher_id is the part of the primary key of teacher relation
(2) auther_id in teacher relation can be null value
(3) auther_id and book_id in autherOfbook relation can be null value
(4) book_id is a candidate key of publisherOfbook relation
(5) auther_name in auther relation is a candidate key

26. The following SQL is executed on the database relations given above.

SELECT * FROM teacher WHERE auther_id is NOT NULL;

Which of the following is correct about the SQL?

(1) Output can not be an empty table
(2) teacher and auther tables are used to obtain the output
(3) auther_name attribute is in the output
(4) publisher_name attribute is in the output
(5) output can contain the records in the teacher table in which auther_id consists of values

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27. Consider the following statements about data definition language (DDL) which is used to create the table publisherOfbook by maintaining data integrity.

A - It contains foreign key constraint

B - It contains primary key constraint

C - It contains domain constraint

Which of the above is/ are syntactically correct?

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

28. Consider the following relation.

Student (index_no, student_name, date_of_birth, hobbies)

Where index_no is a unique attribute and hobbies take multiple values.

Which of the following is / are correct table/s when Student table is converted to first normal form?

(1) Student (index_no, student_name, date_of_birth) and hobby (index_no, hobbies)

(2) Student (index_no, student_name, date_of_birth) and hobby (hobbies)

(3) Student (index_no, student_name, date_of_birth, hobby1, hobby2)

(4) Student (index_no, student_name, date_of_birth) and hobby (index_no, hobby1,hobby2)

(5) hobby (index_no, hobbies)

29. Which of the following SQL command is a type of DML(data manipulation language)?

(1) drop (2) grant (3) update (4) create (5) alter

30. Which of the following SQL can be used to create a table 'Person' with a primary key constraint for the field 'personID'?

(1) CREATE TABLE Person (personID int(5) PRIMARY_KEY, name VARCHAR(30), age int(3));

(2) CREATE TABLE Person (personID int(5), name VARCHAR(30), age int(3) PRIMARY KEY);

(3) CREATE TABLE Person (personID int(5) PRIMARY KEY, name VARCHAR(30), age int(3));

(4) CREATE TABLE Person (personID int(5), name VARCHAR(30), PRIMARY KEY, age int(3));

(5) CREATE TABLE Person (PRIMARY KEY personID int(5), name VARCHAR(30), age int(3));

Consider the following Python program to answer questions **31** and **32.**

```
a = [51,12,37,4,15,61]
b = a[0]
for k in range (1,6):
    if b > a[k]:
        b = a[k]
print(b)
```

31. What is the output of this Python program?

(1) 51 (2) 4 (3) 12 (4) 61 (5) 15

32. What will be the output if the Python statement if b > a[k]: is changed to if b < a[k]: ?

(1) 51 (2) 4 (3) 12 (4) 61 (5) 15

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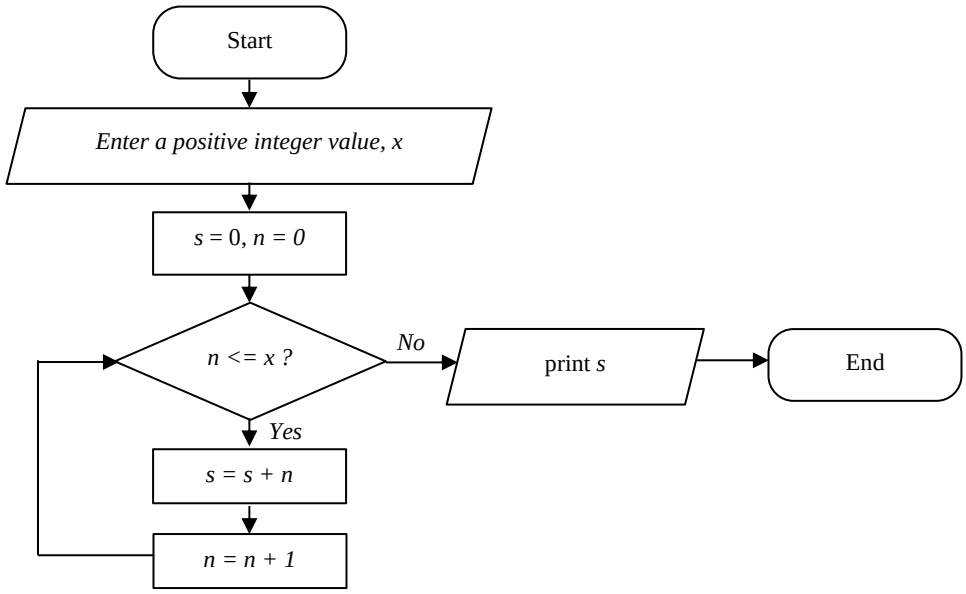
33. Consider the following statements about the algorithm given by the flowchart below.



A - If x = 0, the output would be also 15
B - If x obtains negative values, algorithm will generate only negative values
C - If x = 0, algorithm expects five 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

34. Which of the following Python program(s) is / are equivalent to the algorithm given in **(33)** above.

I

```
x = int(input("Enter a number:"))
s = 0
n = 0
while n <= x:
    s = s + n
    n = n + 1
print(s)
```

II

```
x = int(input("Enter a number:"))
s = 0
n = 1
while not (n >= x):
    s = s + n
    n = n + 1
print(s)
```

III

```
x = int(input("Enter a number:"))
s = 0
n = 0
while not (n > x):
    s = s + n
    n = n + 1
print(s)
```

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

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35. Consider the following Python program.

```
x = 200
def myfunc():
    global x
    x = 300
    x = 100
myfunc()
x = 50
print(x)
```

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

(1) 200 (2) 300 (3) 100 (4) 50 (5) error message

36. Consider the following Python statements.

A - *a, b = [], ()*
B - c = *[[[[]]]]*
C - *d = true*
D - *e = 2e-2*

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

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

37. In the following Python program, what would be the output if the user input is given as 60?

```
var = 5
while var > 0:
    print(var, end='  ')
    var = var - 1
    if var == 3:
        break
```

(1) 5 4 2 1 (2) 5 4 (3) 4 5 (4) 5 4 3 2 1 (5) 3

38. What would be the output after the Python statement *print(~4+5^2-1)* is evaluated?

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

39. Consider the following statements about errors in computer programming.

A - Syntax error is also called compile-time error
B - Syntax error reveals error messages
C - Logical error reveals error messages
D - Run-time error is also called semantic error

Which of the above is / are correct?

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

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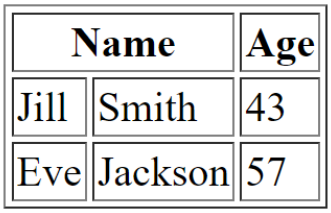
40. Consider the following HTML code.

* Visit ebooks *

A - ① is replaced by "_blank", it opens the document in a new window
B - ① is replaced by "_parent", it opens the document in the parent frame
C - ① is replaced by "_self", it opens the document in the same window

Which of the above is / are correct?
(1) A only (2) C only (3) A,B only (4) B,C only (5) A,B,C all

41. Consider the following HTML code and its output.

HTML Code	Output
<❶ border="1"> *<❷>* *<❸ colspan="2"> Name </❸>* *<❸> Age </❸>* *</❷>* *<❷>* *<❹> Jill </❹>* *<❹> Smith </❹>* *<❹> 43 </❹>* *</❷>* *<❷>* *<❹> Eve </❹>* *<❹> Jackson </❹>* *<❹> 57 </❹>* *</❷>* *</❶>*	

❶, ❷, ❸ and ❹ are respectively.

(1) <table>, <tr>, <th>, <td>
(2) <table>, <li>, <th>, <td>
(3) <table>, <tr>, <ul>, <td>
(4) , <tr>, <th>, <td>
(5) <table>, <td>, <th>, <caption>

42. Which of the following CSS code is correct to define margin for a text?
(1) *p {text-margin: 100px 20 px 50 px 70px;}*
(2) *p {margin-text: 100px 20 px 50 px 70px;}*
(3) *p {margin: 100px 20 px 50 px 70px;}*
(4) *p {top-margin: 100px 20 px 50 px 70px;}*
(5) *p {marginright: 100px 20 px 50 px 70px;}*

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43. Which of the following syntax can used to comment for a CSS code?

(1) / (2) # (3) /* */ (4) \\ (5) !

44. Consider the following PHP statements.

A - *<?php echo "Welcome"; ?>*
B - *<?php ECHO "PHP"; ?>*
C - *<?php PRINT "Web Server"; ?>*
D - *<?php print "Apache"; ?>*

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

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

45. Consider the following statements about http methods.

A - GET requests remain in the browser history
B - GET requests cannot be bookmarked
C - POST requests have no restrictions on data length
D - GET requests should never be used when dealing with sensitive data

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

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

46. Consider the following PHP script.

```
<?php
    $cars = array("Volvo", "BMW", "Toyota");
    $arrlength = count($cars);
    for($x = 0; $x < $arrlength; $x++)
    {
        echo $cars[$x];
        echo "<br>";
    }
?>
```

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

(1) 3 (2) Volvo BMW Toyota (3) Volvo BMW

(4) Volvo
BMW
Toyota

(5) Volvo
Toyota

47. In e-commerce, "…… is the management of the flow of goods and services and includes all processes that transform raw materials into final products".

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

(1) Competitive advantage
(2) Supply chain management (SCM)
(3) Online revenue model
(4) Online market place
(5) Shopping cart

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48. Consider the followings.

A - Security and privacy issues
B - Expensive to implement
C - Possible access of personal and sensitive information
D - Efficient resource utilization

Which of the above can be the limitations of IoT (Internet of Things) implementation?
(1) A only (2) A,B only (3) B,C only (4) A,B,C only (5) A,B,C,D all

49. Consider the following statements about quantum computing.

A - Quantum computing is made up of qubits
B - The power of quantum computers grows exponentially with more qubits
C - All the fourth generation computers are based on qubits

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

50. Consider the following statements about software agents.

A - Buyer agents travel around a network (e.g. the Internet) retrieving information about goods and services
B - Personal agents may check users' e-mail, sort it according to the users' order of preference, and alert them when important emails arrive
C - The software agents may keep track of company inventory levels, observe competitors' prices and relay them back to the company, watch stock manipulation by insider trading and rumors, etc.

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

****

[End