

බස්නාහිර පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
மேல் மாகாணக் கல்வித் திணைக்களம்
Department of Education - Western Province

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය 2022 - උපකාරක ප්‍රශ්න පත්‍ර 01
General Certificate of Education (Adv. Level) Examination 2022- Model Paper 01

තොරතුරු හා සන්නිවේදන තාක්ෂණය - I
Information & Communication Technology - I

20

E

I

පැය දෙකයි
Two Hours

Instructions

- ❖ Answer all the questions.
- ❖ Write your index number in the given space on the answer sheet.
- ❖ For each question from 1 to 50, choose the correct or most suitable answer from (1), (2), (3), (4), (5) and put a cross (X) on the corresponding number on the answer sheet.
- ❖ Use of calculators and correction fluid are not allowed.

1. Choose the incorrect statement about copyrighted software and free and open source software
 - (1) Once a person buys a licensed software, it can be installed on multiple computers without any legal restrictions.
 - (2) The user only has the right to use free and open source software and its distribution and copying is illegal.
 - (3) Free and open source software is available without any payment.
 - (4) Licensed software often needs to be renewed after a certain period of time.
 - (5) The source code of free software cannot be edited
2. Which of the following systems is not suitable for real time data processing?
 - (1) weather forecasting system
 - (2) Flight Reservation system
 - (3) Radar detection system
 - (4) spacecraft controlling system
 - (5) payroll system
3. What is the memory unit that can be identified as logical in the hard disk?

| | | |
|---------------------------|--------------------|------------------|
| (1) Read Only Memory(ROM) | (2) Main Memory) | (3) Cache Memory |
| (4) Register Memory | (5) Virtual memory | |
4. The 8 bits two's complement of $6+(-4)$ is ?

| | | | | |
|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| (1) 11111101 ₂ | (2) 110000011 ₂ | (3) 11111011 ₂ | (4) 00000010 ₂ | (5) 11111000 ₂ |
|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|

5. What is the decimal representation of the binary value **1111.011**?

- (1) 15.375 (2) 15.875 (3) 16.145 (4) 16.375 (5) 15.775

6. Which of the following represents the equivalent hexadecimal value of 75_8 ?

- (1) $2B_{16}$ (2) $3E_{16}$ (3) $2E_{16}$ (4) CD_{16} (5) $3D_{16}$

7. The characters in the table below are presented using ASCII character encoding systems.

| | | | | | | | | | | |
|-----------|----|----|-----|-----|-----|-----|-----|-----|------------------------|-------|
| Decimal | 72 | 87 | 101 | 108 | 111 | 114 | 100 | 104 | 10 | 32 |
| Character | H | W | e | l | o | r | d | h | Line feed/ new line | Space |

Accordingly, indicate how the following words are represented by the ASCII coding system. This word ends with the (line feed) attribute.

Hello World

- (1) 72 101 108 108 111 32 87 111 114 108 100 10
 (2) 72 101 108 108 111 87 111 114 108 100 10
 (3) 72 101 108 108 111 32 87 111 114 108 100
 (4) 104 101 108 108 111 32 87 111 114 108 10
 (5) 104 101 108 108 111 87 111 114 108 100 10

8. According to the fetch execute cycle, the instruction is decoded from which of the following component?

- (1) Cache Memory (2) Arithmetic and Logic Unit (3) Main Memory
 (4) Control Unit (5) Register

9. How many 2-input NANDs are required to construct the Boolean expression $\bar{A}.B + A.\bar{B}$ using only NAND gates?

- (1) 4 (2) 5 (3) 6 (4) 7 (5) 8

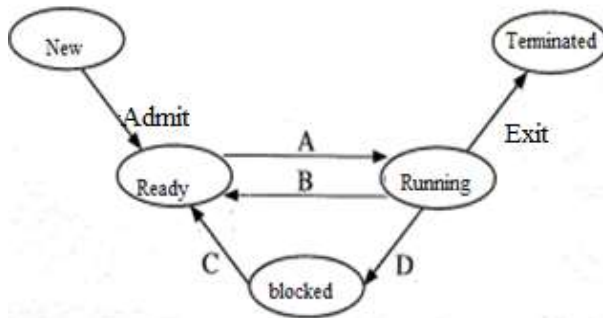
10. Consider the given Karnaugh map. Its A,B,C are inputs and Z is output.

What should be the values of e,f,g,h in the following K-map to give the output $Z = \bar{A}.C$?

| | | | | |
|---|----|----|----|----|
| | AB | | | |
| | 00 | 01 | 11 | 10 |
| 0 | e | f | g | h |
| 1 | 1 | 1 | 0 | 0 |

- (1) $e=1, f=0, g=1, h=0$ (2) $e=1, f=0, g=0, h=1$
 (3) $e=0, f=0, g=0, h=0$ (4) $e=1, f=1, g=0, h=0$
 (5) $e=1, f=1, g=1, h=1$

11. Mohan logs into a single processor computer, starts the spreadsheet software and works. It also opens a web browser to retrieve information from the Internet. The following transition diagram shows the stages of operation related to Mohan's spreadsheet operation.



Below are some reasons for the above transitions.

| Reason | Description |
|--------|--|
| 1 | Mohan is entering data into his spreadsheet |
| 2 | Stop spreadsheet software running, to allow the operating system to run the web browser on the central processing unit |
| 3 | Completion of data entry in the spreadsheet |
| 4 | The operating system specifies that the spreadsheet function run on the central processing unit. |

Which combination of reasons fits the transitions from A to D above?

- (1) A-1 , B-2 , C-4 , D-3 (2) A-1 , B-3 , C-2 , D-4 (3) A-4 , B-2 , C-3 , D-1
 (4) A-4 , B-1 , C-4 , D-2 (5) A-2 , B-4 , C-2 , D-3
12. What is the size of virtual memory if its address consists of 32 bits and the memory is byte addressable.
 (1) 4 x 1024 MB (2) 4 x 1024 GB (3) 8 x 1024 GB
 (4) 4 x 1024 KB (5) 8 x 1024 MB
13. What is false about a process
 (1) A process is not a program
 (2) A process can be executed by the central processing unit
 (3) A single program can have multiple processes
 (4) A process contains several programs
 (5) On a single-processor multitasking computer, the process switches between different states after an operation is initiated.

14. The size of a block of a disk is 8KB. A part of the File Allocation Table (FAT) of that disk will look like this in a certain case. That section also shows the blocks of the firstprog.py file.

| Directory Entry | |
|-----------------|-----|
| 500 | 504 |
| 501 | |
| 502 | 500 |
| 503 | -1 |
| 504 | 503 |

Note :

1. The last block of a file is indicated by -1.
2. The first block no of a file is indicated in the directory entry.

Which of the following represents the directory entry of the firstprog.py file and the amount of disk space allocated for the firstprog.py file, respectively?

- (1) 500, 24 KB (2) 500 , 32 KB (3) 502 , 24 KB (4) 502 , 32 KB (5) 504,32KB

15. Which of the following is true about analog signal?

- A - Consists of a continuous value range
B - Sound waves are examples of analog signals
C - Two values 0 and 1 are used to represent information

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

16. Which of the following is correct regarding unguided media used in data communication?

- A – No physical path is required for data transmission
B – Twisted pair is an example.
C - The signal is transmitted visibly through the atmosphere

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

17. What happens in Pulse Code Modulation

- (1) Digital Modulation (2) Decoding (3) Analog to digital conversion
(4) Encryption (5) Demodulation

18. A protocol used in data communications where reliability is not expected

- (1) TCP (2) HTTPS (3) FTP (4) UDP (5) ASCII

19. Which of the following server computer enables the SMTP protocol ?

- (1) DNS Server (2) Mail Server (3) DHCP Server
(4) Proxy server (5) Web Server

20. For the security of the data sent in data communication, the data is converted into an unreadable state, i.e. a code text (cipher text). An instance of doing so is as follows.

| | | | | | |
|----------------------|----|----|----|----|----|
| plaintext | H | E | L | L | O |
| + key | +1 | +1 | +1 | +1 | +1 |
| = cipher text | I | F | M | M | P |

If the value of the key (KEY) in the above conversion process is +2, the coded text will be output.

- (1) LIPPS (2) KHOOR (3) IFNNQ (4) GDKKN (5) JGNNQ

21. When a data packet arrives at the router from an external network, theAaddress in the packet is converted into theB.....address in the network and the network Outgoing messages are converted by the router to C , ... D This process is called Network address translation (NAT).

Choose the most appropriate words to answer the blanks A,B,C,D.

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

22. Consider the following sections on various information systems.

| | |
|---|----------------------------------|
| A. Order processing system | X) TPS (ගනුදෙනු සැකසීමේ පද්ධතිය) |
| B. Summarized system for the daily work of an organization. | Y) MIS (කළමනාකරණ තොරතුරු පද්ධති) |
| C. 5 years sales trend forecasting system | Z) DSS (තීරණ සහයක පද්ධති) |

Which of the following matches to the above table.

- (1) A-X,B-Z,C-Y (2) A-Y,B-Y,C-Z (3) A-X,B-Y,C-Z
(4) A-Z,B-Y,C-Z (5) A-Z,B-X,C-Y

23. Divides work into time groups to release special features.. This is a renewal approach, and the software is released after each renewal. Each build is developed and the final output contains all the requirements of the users.

The system development model that best matches the above expression is

- (1) Waterfall model (2) Spiral model (3) agile model
(4) Prototyping (5) Rapid application development model

24. Choose the correct statement/s about object orientation from the following clauses.
- A. Ideal for designing systems with rapidly changing requirements.
 - B. Identifies the objects and interactions between them related to the problem
 - C. Homogeneity involves grouping objects together to create classes.
 - D. Creates objects based on classes.
- (1) A, B (2) C, D (3) A, B, D (4) B, C, D (5) All are correct
25. Which of the following tests can be done by both the white box testing and black box testing methods?
- A. Unit testing
 - B. Integration testing
 - C. System testing
 - D. Acceptance testing
- (1) A, B (2) C, D (3) A, B, D (4) B, C, D (5) All are correct
26. Which of the following statement is incorrect regarding drawing data flow diagram
- (1) A data flow can occur between an external entity and a process
 - (2) A data flow can occur between an external entity and a datastore.
 - (3) A data flow can occur between a process and a datastore.
 - (4) A Data flow cannot occur between two data stores.
 - (5) Data cannot flow between two processes.
27. Which is not a functional requirement of a library information system?
- (1) The system must be able to add new members.
 - (2) The information in the books must be updated.
 - (3) Members information must be able to check
 - (4) The fines to be collected from the members must be calculated and shown.
 - (5) The system must provide services throughout the day
28. When implementing the QR code fuel issuing system in Sri Lanka, it was first tried in the suburbs of Colombo and then started to be implemented in other districts. This software installation method is best suited for...
- (1) Parallel implementation (2) Direct Implementation (3) Phase Implementation
 - (4) Pilot Implementation (5) none of the above.
29. Considering a table in a database, which can be selected among Candidate key
- (1) Composite key (4) Alternate Key
 - (2) Super Key (5) Unique Key
 - (3) Foreign key

Consider the table below to write answers to question numbers 30 to 33.

Customer Table

| Num | CustName | City | Country | ProdID | Description |
|-----|----------|----------|---------|--------|-------------|
| 005 | Bill | London | England | 1 | Table |
| 005 | Bill | London | England | 2 | Desk |
| 008 | Mary | Paris | France | 2 | Desk |
| 008 | Mary | Paris | France | 7 | Cupboard |
| 014 | Anne | New York | USA | 5 | Cabinet |
| 002 | Tom | London | England | 7 | Cupboard |
| 002 | Tom | London | England | 1 | Desk |

30. The primary key of this table should be

- (1) Num (2) ProdID (3) Num and ProdID (4) City (5) Num and City

31. What will be the result when the above table is subjected to Second Normal Form (2NF),

- A- Customer (Num, CustName, City, Country) B- Product (ProdID, Description)
C- Cust_prod (Num, ProdID)

- (1) A only (2) B only (3) C only (4) A and B only (5) all of the above.

32. By subjecting this table to the Third normalization (3 NF), the resulting table/tables are...

- A - Customer (Num, CustName, City) B- City_Country (City, Country)
C- Product (ProdID, Description) D- Cust_Product (Num, ProdID)

- (1) A only (2) A and B only (3) A and D only
(4) A, B and C only (5) all of the above.

33. The SQL code to change Bill's name to John in the above table could be...

- (1) select Bill from Customer;
(2) update Bill from Customer;
(3) update Customer set CustName = 'Bill';
(4) update Customer set CustName = 'John' where Num = '005';
(5) update Customer set Name = 'John' where Number = '005';

34. The features that can be present in an extended ER diagram (EER) created by extending an ER diagram are

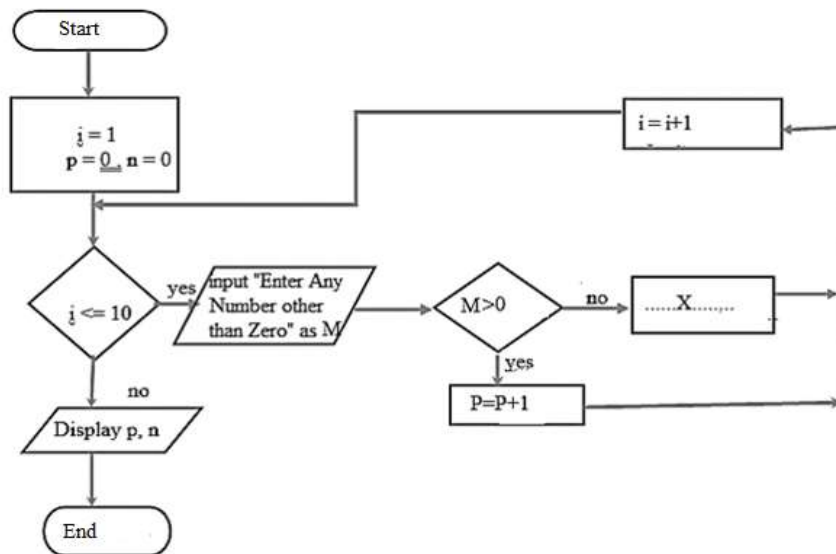
- A - Generalization B - Specialization C - Inheritance

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

35. Which of the following contain only DML (Data Manipulation Language) commands

- (1) CREATE, SELECT (2) ALTER, UPDATE (3) UPDATE, SELECT
(4) ALTER, DROP (5) DROP, DELETE

- Consider the algorithm expressed by the flowchart below and answer questions 36 and 37. This is expected to represent the number of positive and negative numbers among the 10 digits entered.



36. In the above flowchart, what should be entered at X ,
 (1) $n = n + 1$ (2) $p = p - 1$ (3) $p = p + 1$ (4) $p + 1$ (5) $p = p + \text{no}$
37. Which of the following Python programs represents the above flowchart?

I.

```

n = 0
p = 0
i = 1
while i <= 10:
    a = int(input("Enter no "))
    if a > 0:
        p = p + 1
    else:
        n = n + 1
    i = i + 1
print(p,n)
  
```

II.

```

n = 0
p = 0
i = 1
while i <= 11:
    a = int(input("Enter no "))
    if a > 0:
        p = p + 1
    elif a < 0:
        n = n + 1
    i = i + 1
print(p,n)
  
```

- (1) I. Correct II Incorrect. (2) I. Incorrect II correct. (3) I. and II correct.
 (4) I. and II correct. (5) Python cannot represent the above flowchart
38. Which of the following answers will be output as "Simon"?

str1 = "John,Simon,Aryan"

- (1) `print(str1[-7:-12])` (2) `print(str1[-11:-7])` (3) `print(str1[-11:-6])`
 (4) `print(str1[-7:-11])` (5) `print(str1[-6:-10])`

39. The output of the following Python code is...

```
st = " Know Program"  
print(st[:5] + " Python")
```

- (1) Know (2) Know Python (3) Know Program
(4) Python Know (5) none of the above.

40. The output of the following Python code is...

```
Set1 = {0,0,9}  
Print(set1)
```

- (1) {0,0,9} (2) {0,9} (3) {9} (4) {0} (5) Syntax Error

41. W = [3,2,5,1,6]

```
for x in range (1, W [4] -1):
```

```
print (x , end = "")
```

The output here is,

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

42. The output of the following PHP program is....

```
<? Php  
$x = 40;  
While ($x>=50){  
    echo " Number is :$x<br>";  
    $x++;  
}  
?>
```

- (1) 10,20,30,40,50 (2) 40,50
(3) an infinite program (4) never executed
(5) Values from 40 to 50 will be represented

43. Which of the following can be used to display a hyperlink without underline using CSS is

- (1) a{decoration:no-underline;} (2) a{underline:none;} (3) a{text-decoration:none;}
(4) a{text-decoration:no-underline;} (5) a{no:underline;}

44. The code that can be used to insert a video into a web page using HTML is.....

- (1) <Video> (2) <movie> (3) <media> (4) <audio> (5) <film>

45. The way of preparing an array using PHP is...

- (1) \$car = array["Volvo", "BMW", "Toyota"];
- (2) \$car = array("Volvo", "BMW", "Toyota");
- (3) \$car = Volvo", "BMW", "Toyota";
- (4) \$car = array{"Volvo", "BMW", "Toyota"};
- (5) \$car = array in ("Volvo", "BMW", "Toyota");

46. Consider the following code regarding use of HTML form

```
<input type = text name = "telno" size="10" maxlength="15">
```

This means.....

- I. A text input box that can only enter 15 characters.
- II. A text input box that can only enter 10 characters
- III. The smallest value can be 0 and the largest value can be 100.

- (1) Only I is correct.
- (2) Only I and II are correct.
- (3) Only I and III are correct.
- (4) All are correct.
- (5) All are incorrect

47. In the digital economy, reducing the price of goods using buyers' power occurs in
Which of the following is most suitable to fill the blank.

- (1) Reverse Auction
- (2) Auction
- (3) Group Purchasing
- (4) Virtual marketing
- (5) Digital marketing

48. One of the most effective e-marketing methods is

- (1) Wall Papers
- (2) E-poster
- (3) SMS
- (4) Email messages
- (5) Social media

49. Which of the following is/are examples of actuators ?

A. - Temperature sensors B – fan C – Buzzer

- (1) A only
- (2) A and B පමණි
- (3) A and C only
- (4) B and C only
- (5) All of A,B,C

50. Which is not an example for nature inspired computing?

- A - Swam computing
- B - Genetic Algorithm
- C- Neural Network

- (1) A only
- (2) A and B පමණි
- (3) A and C only
- (4) B and C only
- (5) All of A,B,C