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Provincial Department of Education - NWP

තෙවන වාර පරීක්ෂණය - 13 ශ්‍රේණිය - 2024

Third Term Test - Grade 13 - 2024

20 S I

Index No.: .....

Information And Communication Technology- I

02 hours

Instructions :

- *Answer **all** the questions.*
- *Write your **Index Number** in the space provided in the answer sheet.*
- *Instructions are also given on the back of the answer sheet. Follow those carefutlly.*
- *In each of the questions **1** to **50**, pick one of the alternatives fiom (1), (2), (3), (4), (5) which is **correct or most appropriate** and **mark your response on the answer sheet with a cross (x) in accordance with the instructions given on the back of the answer sheet.***
- *Use of calculators is **not allowed.***

1. Which of the following statement/statements are correct?

A - Installing an operating system software on a computer requires permission from the software developer.

B - Installing some application software on a computer, the permission of the software developer must be obtained.

C - Installing utility software on a computer does not require the permission of the software developer at all.

(1) A only (2) B only (3) C only

(4) A and C only (5) B and C only

2. All of the following validation methods are carried out for data input in a particular software system.

- Presence check
- Range check
- Type check

Which of the following is most likely to be the above data input scenario?

(1) Entering a PIN into an ATM machine.

(2) Entering an email address to register on an online website.

(3) Entering credit card number to complete an online payment.

(4) Entering the withdrawal amount at an ATM machine.

(5) Entering a username to log in to a social media website.

3. Consider the statementss in the left column and the devices in the right column.

Statements	Device
A. Can be connected to the computer using parallel or USB ports.	① - Laser Printer
B. Used to get large amounts of printing.	② - Inkjet Printer
C. High-quality printing is done by spreading ink dot wise across the direction of the paper travel.	③ - Dot Matrix Printer
D. The print is firmly fixed onto the paper through heating.	④ - Plotter

Which answer matches the descriptions in the left column with the devices in the right column?

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

4. Which of the following can be considered as the main use of the register called the accumulator (ACC) in the Central Processing Unit?

(1) Storing the memory address of the memory location that holds the next instruction to be executed in relation to a program.
(2) Storing the memory address of a memory location which contains data to be executed.
(3) Storing the results created during an execution.
(4) Storing data to be executed.
(5) Storing the currently executing instruction.

5. The abstract model of a pseudo code of a certain program is given below.

Definition of Function A
Statement P
Call to Function A
Statement Q
Statement R
Call to Function A
Statement S
Call to Function A

Consider that there are about 20 lines only in the code section of the Definition of *FunctionA* in the above program.
To run the program more efficiently, in which of the following memory devices should the code section relevant to defining *FunctionA* be included?

(1) Cache
(2) Hard Disk
(3) Register
(4) RAM
(5) ROM

6. Consider the following statements.
   A - Increasing the effiency of getting data.
   B - Minimizing human errors that may occur during data input.
   C - Supporting online payments.

   Bar-code Reader and Smart Card Reader are used for processes related to the cashier in a supermarket. Which of the above can be considered as the objectives of using these devices?

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

7. What is the correct decimal equivalent of binary 101101.111_2?
   (1) 42.575 (2) 45.875 (3) 44.265 (4) 40.875 (5) 44.265

8. Which of the following are equivalent to hexadecimal $2A_{16}$?

   A. 52_8 B. 42 C. 00101010_2

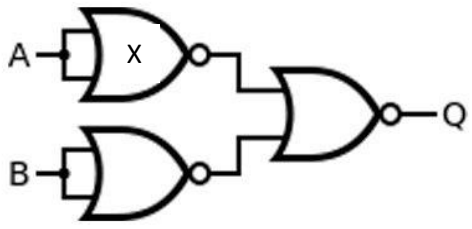
   (1) A only (2) A and B only (3) A and C only
   (4) B and C only (5) All A, B and C

9. A document contains 2048 characters including spaces between words and line-breaks. How many bits are needed to encode this document in ASCII also using the parity bits?
   (1) 1024 (2) 1024 x 8 (3) 1024 / 8 (4) 1024 x 7 (5) 1024 / 7

10. Select the answer obtained by calculating (-9) + 5 using the two's complement 8-bit binary representation.
    (1) 00000100_2 (2) 10000100_2 (3) 11111000_2 (4) 11111100_2 (5) 11111101_2

11. Select the answer obtained by calculating $1A_{16} + 3B_{16}$
    (1) $4C_{16}$ (2) $13AB_{16}$ (3) 421_{16} (4) $4AB_{16}$ (5) 55_{16}

12. Consider the statements i, ii, and iii about the following logic circuit.



   i. The gate named X implements a NOT gate.
   ii. The given circuit implements an AND gate.
   iii. If the values of A and B are 1 and 0 respectively, then the value of Q is 1.

   Which of the above statements are considered as correct?
   (1) i only (2) ii only (3) i and ii only
   (4) i and iii only (5) All i, ii and iii

13. Select the correct answer that includes the terms that can be used to fill in the blanks respectively in the description below.

There are ..... inputs in a Half Adder. A ..... gate is used to get the output denoted as sum of it. A ..... gate is used to get the output denoted as carry of the Half Adder.

(1) 3, AND , XOR (2) 2, XNOR, NAND (3) 2, AND , XOR
(4) 2, XOR , AND (5) 3, NAND, XOR

14. Which properly describes the objective of spooling in Operating Systems?
(1) Managing input/output operations.
(2) Managing the memory fragmentation.
(3) Facilitating communication among processes.
(4) Optimizing the processor scheduling.
(5) Regulating access to file systems.

15. What memory management technique is used as a solution to external fragmentation in memory?

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

16. Consider the following information contained in a data packet in data communication.

A – Protocol
B – Destination Address
C – Packet Number

Select the content/contents of a data packet header from above information.

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

17. Select the **incorrect** statement regarding signal transmission.
(1) Due to attenuation, the signal received at the receiving end may be completely different from the signal sent by the transmitting end
(2) Attenuation is the reduction in the strength of a signal as it passes through a medium.
(3) A signal should be recovered using an amplifier, before attenuation occurs.
(4) Noise can be caused by electrical waves generated by events such as lightning.
(5) In the case of signal distortion, due to the induction and capacitance of the communication medium, the amplitude of the waves changes and the frequencies are delayed in different ways.

18. Which of the following statement(s) is/are correct regarding broadcasting?

A – Broadcasting is the transmission of data from one device on a network to one or more devices on that network.
B – Multicasting is the simultaneous transmission of data from one device on a network to several devices on the same network or on another network.
C – Broadcasting is the simultaneous transmission of data from one device on a network to all devices on that network or on another network.

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

19. Select the **incorrect** statement regarding Modulation.
    (1) Amplitude Shift Keying (ASK) is used to convert a digital signal into an analog signal.
    (2) Frequency Shift Keying (FSK) is used to convert an analog signal into a digital signal.
    (3) Frequency Modulation (FM) is commonly used in radio transmissions.
    (4) In Amplitude Modulation (AM), the amplitude of the carrier signal varies according to the amplitude of the data signal.
    (5) Pulse Code Modulation (PCM) is used to convert an analog signal into a digital signal.

20. Select the correct statement from the following statements.
    (1) In asymmetric encryption, data encrypted with a public key can only be decrypted with the corresponding private key.
    (2) A firewall, used only as hardware, controls access to computer networks.
    (3) A digital signature is encrypted using a public key and decrypted with a private key.
    (4) Piracy is a harmful computer program that attacks computers by misleading users.
    (5) Error detection is always accurate in a parity check.

21. In which of the following forms the data exists at the network layer of the OSI model?
    (1) Data (2) Segment (3) Packets (4) Frame (5) Bits

22. Which of the following is a private IP address?
    (1) 172.18.0.255 (2) 172.32.0.0 (3) 11.168.35.41
    (4) 192.167.0.0 (5) 192.255.255.255

23. Select the answer that includes the most suitable deployment methods for the following scenarios:
    A – First, the part related to the production section of the new system will be installed in the production department. After its successful implementation, the part related to the sales section of the new system will be installed in the sales department.
    B – The new system has been installed on all user computers in the organization. The users will begin using it this upcoming Monday. The old system will no longer be in use.
    C – Before the new system is fully implemented, it has been installed on several user computers in the organization to identify potential issues.

    (1) A - Phase B - Direct C - Pilot
    (2) A - Parallel B - Phase C - Pilot
    (3) A - Phase B - Parallel C - Direct
    (4) A - Direct B - Parallel C - Phase
    (5) A - Parallel B - Direct C - Phase

24. Which of the following is a *functional requirement* for an online banking system?
    (1) The system should remain operational 99% of the time.
    (2) The system should allow users to transfer money between their accounts.
    (3) The system should have a modern and friendly user interface.
    (4) The system should support 256-bit encryption for all transactions.
    (5) The system should support Sinhala, Tamil and English languages.

25. Select the statement describing the scenario in which the integration test will take place.

A – Checks that the interaction between the payment gateway and the shopping cart module is done correctly to ensure successful transaction processing.
B – User authentication module is checked to ensure success in identifying user identity.
C – Testing the speed of loading product images in the Product Catalog module.

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

26. During a feasibility study for a new inventory management system, which of the following findings most likely indicates that the project is technically feasible?

(1) The proposed cost of the system is within budget.
(2) Current staff have the necessary skills to operate the new system.
(3) The benefits of the new system are greater than the costs over a five-year period.
(4) The new system is expected to significantly improve customer satisfaction.
(5) The new system can integrate with existing hardware and software.

27. What does a context diagram of a supermarket primarily represent?

(1) Detailed interaction between customers and checkout counter.
(2) A high-level overview of the relationships between the system and external entities.
(3) Detailed interaction of inventory management within departments.
(4) Precise data flows between cashiers and central database.
(5) Detailed flow of financial transactions within the supermarket.

28. Which of the following is correct regarding the characteristics of the **Agile** model?

(1) It is essential to determine requirements thoroughly and prepare documentation and plans before system development.
(2) Promotes a sequential approach to software development. Ensures each phase is completed before moving to the next.
(3) Software developers work in isolation with minimal interaction with customers throughout the project.
(4) Allows for customer collaboration and opportunities for feedback during software development.
(5) Prioritizes fixed requirements and contracts, minimizing flexibility during the development process.

29. Consider the following statements about Commercial Off-The-Shelf (COTS) packages.

A – Since COTS packages are ready-made solutions, they reduce development time and cost.
B – COTS packages provide high customization options to meet specific business needs.
C – COTS packages limit business processes to a single framework, making it difficult to switch to alternative solutions.

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

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

30. Consider the following statements about a relation that exists only in the 2nd normal form.

A – Partial dependencies must have been removed.

B – All non-key attributes must be fully functionally dependent on the primary key.

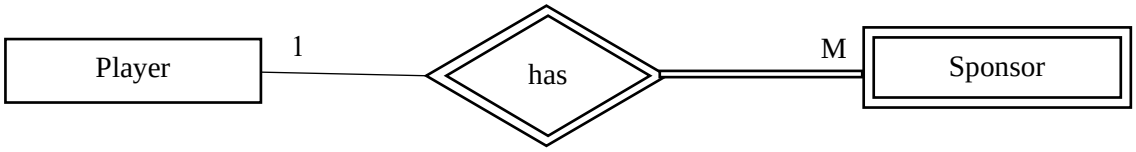
C – Transitive dependencies must have been removed.

Which of the above statements are correct?

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

(4) B and C only (5) All A, B and C

31. Consider the statements regarding the following ER diagram.



A – Player relationship has a partial participation on Sponsor relationship

B – Sponsor relationship has a total participation on Player relationship.

C – It is not mandatory that all the components of Sponsor relation are related to Player relation.

D – It is not mandatory that all the components of Player relation are related to Sponsor relation.

Which of the above statements are correct?

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

(4) B, C and D only (5) All A, B, C and D

32. Consider the following Relations:

Student(StudentID , StudentName , NIC , Gender , hobby, ClassID)

Class(ClassID,ClassName)

- Note that since the hobby attribute in the above Student relation has multiple values, StudentID may be duplicated in the records.

Which of the following statements regarding the above Student and Class relations is correct?

(1) The Student and Class tables are in the first normal form.

(2) The Student table is in the zero normal form and the Class table is in the second normal form.

(3) The Student table is in the zero normal form and the Class table is in the third normal form.

(4) The Student table is in the second normal form and the Class table is in the third normal form.

(5) The Student table is in the first normal form and the Class table is in the third normal form.

33. Which of the following statements is correct regarding the following SQL statement?

DELETE FORM employee WHERE name= “kamal” and address= “colombo”;

(1) Here only one record of the Employee table is deleted.

(2) In the Employee table, all the records where the name field has the value 'Kamal' or the address field has the value 'Colombo' will be removed.

(3) In the Employee table, all the records where the name field has the value 'Kamal' and the address field has the value 'Colombo' will be removed.

(4) In the Employee table, the first record where the name field has the value 'Kamal' or the address field has the value 'Colombo' will be removed.

(5) In the Employee table, the first record where the name field has the value 'Kamal' and the address field has the value 'Colombo' will be removed.

34. Consider the following statements regarding the following SQL statement.

```
CREATE TABLE student(
St_No char(10) PRIMARY KEY,
St_Name varchar(60) NOT NULL,
Address varchar(50),
Age int(3),
Gender char(10) DEFAULT "male");
```

A – The above table contains a primary key constraint.
B – Data entry in field St_name is mandatory and data cannot be duplicated.
C – Only male can be entered in field Gender.
D – Domain constraints are applied in the table above.

Which of the above statements are correct?

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

- Consider the following **Supplier_Product** table to answer the questions **35, 36** and **37**.

ProductID	ProductName	SuplierID	SuplierName	Quantity	SupplyDate	SupTelephoneNo
P001	book	S001	Jenifer khan	1200	2024/04/04	0701798777
P002	pen	S001	Jenifer khan	1600	2024/04/04	0789623569
P003	Scissor	S002	sudharshan	1000	2024/04/05	0762356988
P001	book	S003	Sathish kumar	500	2024/04/05	0770056001

35. What is the maximum number of tables that can be derived, after normalizing the above table?
(1) 1 (2) 2 (3) 3 (4) 4 (5) 5

36. Which of the following is **incorrect** statement regarding the **Supplier_Product** table,
(1) A composite key must be created to uniquely identify the data in the table.
(2) There is a partial dependency in the table.
(3) All the data in the table are atomic.
(4) There is a transitive dependency in the table.
(5) Table is in the first normal form.

37. Select the answer that shows the correct relations for the derived tables after converting the above **Supplier_Product** table in to 3rd normal form.

(1) Product(ProductID, ProductName)
Supplier(SuplierID,SuplierName,Quantity,SupplyDate,Sup_TelephoneNo,ProductID)

(2) Product(ProductID,ProductName)
Supplier(SuplierID,SuplierName,Quantity,SupplyDate,Sup_TelephoneNo)
Product_Supplier(ProductID,SupplierID)

(3) Product(ProductID,ProductName)
Supplier(SuplierID,SuplierName,Sup_TelephoneNo)
Product_Supplier(ProductID,SupplierID,Quantity,SupplyDate)

(4) Product(ProductID,ProductName)
Supplier(SuplierID,SuplierName)
Product_Supplier(ProductID,SupplierID,Quantity,SupplyDate,Sup_TelephoneNo)

(5) Product(ProductID,ProductName)
Supplier(SuplierID,SuplierName)
Product_Supplier(ProductID,SupplierID,Quantity,SupplyDate)
Supplier_Telephone(SupplieID,Sup_TelephoneNo)

38. What would be the output of the following Python code, if a = 15, b = 4, and c = 6?

```
ans = a-b % c//2+3
print(ans)
```

(1) 1 (2) 5 (3) 10 (4) 15 (5) 16

39. What would be the value of the **'result'** variable, after executing the following Python code?

```
result=12
def func1(a, b=6):
    return a+b
result= func1(5, (2+3))
```

(1) 6 (2) 10 (3) 11 (4) 12 (5) 25

40. What would be the output of the following Python code, when it gets executed?

```
def string1(str1):
    text=' '
    for i in str1:
        text=i+text

text='Welcome'
string1(text)
print(text)
```

(1) ‘’ (2) 7 (3) emocleW
(4) Welcome (5) ‘W e l c o m e’

41. In the following Python code, what are the correct data structures for variables *number_set1*, *number_set2*, and *number_set3* respectively?

```
number_set1='1,2,3,4,5,6,7'

number_set2=1,2,3,4,5,6,7

number_set2=number_set1.split(',')
```

(1) str, dictionary, List (2) str,tuple,List (3) tuple,tuple,str
(4) str,tuple,dictionary (5) str,str,List

42. What would be the output of the following Python code?

```
for i in range (1,5):
    for j in range(5-i):
        print(i,end=" ")
    print ()
```

(1)
1
2
3
4

(2)
1 1 1 1
2 2 2
3 3

(3)
1 1
2 2
3 3
4

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

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

43. How many '*' s does this program output?

```
i=10
while i>0:
    i-=1
    if i==5:
        break
    if i>5:
        print ('*')
    else:
        continue
        print ('*')
else:
    print ('*')
```

(1) 0 (2) 5 (3) 10 (4) 6 (5) 4

44. What would be the output of the following python code?

```
my_tuple = (10,20,30,40,50)
i = -1
while  True:
    if i == (-5):
        break
    print(my_tuple[i], end=' ')
    i + = (-1)
```

(1) 10 20 30 40 50
(2) 10 20 30
(3) 50
(4) 50 40 30 20
(5) 50 40 30 20 10

45. Select the correct HTML comment
(1) <- - comment -- !>
(2) <!- - comment -->
(3) /* comment */
(4) # comment
(5) // comment

46. Consider the following items.
Which of the following cannot be used as the attribute values of an input element in a form?

A- Date C- radio E - Textarea
B- Email D – Select
(1) A and B only (2) C and D only (3) D and E only
(4) A, B and C only (5) A, B and D only

47. What would be the output when the following PHP code is executed?

```
<?php
$x = 5;
function myFunction( ){
        $x=15;
        echo "Result".$x;
}
myFunction( );
?>
```

(1) 15 (2) Result5 (3) Result15 (4) Result 5 (5) Result 15

48. What is the correct syntax for adding an external style sheet to a web page?
(1) <link rel = “stylesheet” type = “text/css” href = “mystyle.css”>
(2) <stylesheet rel = “stylesheet” type = “text/css” href = “mystyle.css”>
(3) <style rel = “stylesheet” type = “text/css” href = “mystyle.css”>
(4) <link = “stylesheet” type = “text/css” href = “mystyle.css”>
(5) <style> @import url("styles/mystyle.css"); </style>

49. What is the main function of an IOT actuator?
(1) Supporting a mechanical function by acting as a source of energy
(2) Changing environmental conditions by providing outputs
(3) Capturing environmental change.
(4) Operating according to predetermined rules.
(5) Converting energy released by a circuit into mechanical work

50. Select the **incorrect** statement among the following statements about a multi-agent system.
(1) The interaction with the user is conducted by only one agent in such a system.
(2) A multi-agent system may include self-automating agents as well as user-agents.
(3) Each agent in a multi-agent system tends to work cooperatively.
(4) Each agent in the system exhibits characteristics oriented towards its given goal.
(5) A central agent is capable of manipulating other agents in a multi-agent system.