සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved]

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இலங்கைப் பரீடசைத் திணைக்களம் இலங்கைப் பரீடசைத் திணைக்களம்
Department of Examinations,Sri Lanka Department of Examinations,Sri Lanka
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Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2026
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තොරතුරු හා සන්නිවේදන තාක්ෂණය	I
தகவல், தொடர்பாடல் தொழினுட்பவியல்	I
Information & Communication Technology	I

20 E I

පැය දෙකයි
இரண்டு மணித்தியாலம்
Two 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 carefully.*
- *In each of the questions **1** to **50,** pick one of the alternatives from* (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 tasks requires real-time processing?
(1) Printing monthly bank statements for account holders
(2) Generating water bills for customers
(3) Verifying and approving fingerprints at the office entrance
(4) Printing name badges for attendees before a conference
(5) Compiling annual leave summary of employees

2. A student registration system validates user inputs using the following rules:
- The "Date of Birth" field cannot be blank.
- The "Telephone Number" must contain only numeric characters.
- The value of the "Grade" field must be within 1 to 13.

Which of the following correctly lists the corresponding data validation checks for the above three rules in the respective order?
(1) Range check, Presence check, Type check
(2) Presence check, Range check, Type check
(3) Type check, Presence check, Range check
(4) Presence check, Type check, Range check
(5) Range check, Type check, Presence check

3. Which of the following storage media does **not** allow the users to write or erase data?
(1) CD-ROM (2) CD-RW (3) Floppy disk
(4) Hard disk (5) Flash drive

4. Which of the following operation(s) involve(s) the control bus?
A – The CPU sending a read signal to the Main Memory
B – Transferring a data word from the Main Memory to the CPU
C – Carrying the memory address of the data word to be accessed
(1) A only (2) B only (3) A and B only
(4) A and C only (5) All A, B and C

5. During program execution, which of the following stores the memory address of the next instruction to be executed?
(1) accumulator (2) arithmetic and logic unit (ALU)
(3) instruction register (4) program counter
(5) data bus

6. What is the 2's complement binary representation of –1 in an 8-bit system?

(1) 11111111 (2) 00000000 (3) 00000001 (4) 10000000 (5) 11111110

7. If the Unicode code point for A is hexadecimal 41, what does 4E414D45 represent?

(1) NAVY (2) NAME (3) FOOD (4) GAME (5) CAPE

8. Which of the following statement(s) regarding number system conversions is/are correct?

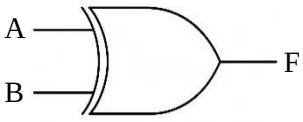
A – $9A_{16} = 10011010_2$
B – $93_{10} = 1011101_2$
C – $645_8 = 110100111_2$

(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. What is the correct binary equivalent of decimal 14.3125_{10}?

(1) 1101.0101_2 (2) 1101.1010_2 (3) 1111.0110_2 (4) 1110.0101_2 (5) 1110.1010_2

10. The diagram shows a two-input X-OR gate.



If A=1, the output F is,

(1) 1 (2) 0 (3) A (4) B (5) $\overline{B}$

11. The boolean expression $AB + A\overline{B} + AC$ is equal to

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

12. Which of the following media is most likely to be affected by Electro-Magnetic Interference?

(1) UTP (2) Microwaves (3) STP
(4) Co-axial cable (5) Fibre optic

13. What is the network mask that equally divides the entire IPv4 address space into 4 subnets?

(1) /2 (2) /4 (3) /8 (4) /24 (5) /26

14. In the local area network in a school laboratory, in what form does a switch forward data between computers?

(1) messages (2) segments (3) packets (4) frames (5) bits

15. FTP uses TCP as its transport layer protocol instead of UDP, because TCP:

A – ensures reliable delivery of data.
B – delivers data in the correct order.
C – uses encryption to secure data.

The correct statement(s) from the above is/are

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

16. Consider the following events that occur when a user accesses a website by entering its URL in a web browser:

A – The DNS client sends a query for the domain name to the DNS server.
B – The browser sends its page request to the web server using the received IP address.
C – The DNS client passes the IP address to the browser.
D – The browser passes the domain name of the URL to the DNS client in the user's computer.
E – The DNS server sends the matching IP address to the DNS client.

Which of the following is the correct order of the above events?

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

17. Which of the following regarding Asymmetric Key Encryption is correct?

(1) Encryption of data with a public key verifies authentication of the sender.
(2) The public key and private key are identical.
(3) A message encrypted using a private key can only be decrypted using the same private key.
(4) Public key cannot be used for decryption.
(5) A message encrypted using a private key can only be decrypted using the corresponding public key.

18. Which of the following requires/require Network Address Translation (NAT)?

A – When the LAN has servers in it.
B – When the LAN is wireless.
C – When the LAN uses private IP addresses.

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

19. Match the **Systems** labelled from A1 – A3 with the **Descriptions** labelled from B1 – B3.

System	Description
A1 – Expert System (ES)	B1 – A system that facilitates authorised staff without programming knowledge to modify what is displayed on the organization's website.
A2 – Management Information System (MIS)	B2 – A system that transforms the records generated by daily business activities into organized summaries for routine decision-making.
A3 – Content Management System (CMS)	B3 – A system that suggests the action for a given situation using the experiences of senior staff stored within it.

Which of the following provides the correct match?

(1) A1 – B1, A2 – B2, A3 – B3
(2) A1 – B2, A2 – B3, A3 – B1
(3) A1 – B2, A2 – B1, A3 – B3
(4) A1 – B3, A2 – B1, A3 – B2
(5) A1 – B3, A2 – B2, A3 – B1

20. A software development team is assigned to develop a small system with low technical risk. The client is unable to clearly specify the system requirements, but can provide useful feedback after sample interfaces are shown. The client does not need this system urgently.
Which of the following system development models is most suitable for this project?

(1) Waterfall model (2) Spiral model (3) Agile model
(4) Prototyping (5) RAD

21. Which of the following statement(s) regarding the classification of systems is/are correct?

A – A sealed chemical reaction flask in a laboratory can be considered a closed system.
B – A school is an open, man-made system as it interacts with its environment.
C – Every natural system is a living system.

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

22. A school plans to computerize student attendance and term-test marks. The feasibility study found that:

A – entering attendance student-by-student each morning would delay the first period.
B – the cost of the proposed equipment would exceed the annual budget allocation.
C – maintaining records in the school's own system conflicts with the Ministry's policy of storing all school records centrally.

Which of the following correctly matches with the feasibility types?

(1) A – operational, B – economic, C – organizational
(2) A – technical, B – economic, C – operational
(3) A – operational, B – technical, C – organizational
(4) A – organizational, B – economic, C – operational
(5) A – technical, B – operational, C – organizational

23. Which of the following is a functional requirement of an online cinema ticket booking system?

(1) The system should be available 99.9% of the time.
(2) The system should respond to any search within 2 seconds.
(3) The system should allow the customer to select seats from a seating plan.
(4) The system interface should be easy to use for a new user.
(5) The system should support up to 5000 concurrent users.

24. Consider the following statements with blanks labelled A, B, and C:

In .....A..... testing, a programmer prepared test data to ensure every IF condition is executed.
In .....B..... testing, the data passed between the combined modules was checked.
In .....C..... testing, the office staff used the software for their daily work and decided whether to approve it.

Which of the following is the correct combination for A, B and C?

(1) A – white-box, B – integration, C – acceptance
(2) A – black-box, B – integration, C – system
(3) A – white-box, B – system, C – acceptance
(4) A – black-box, B – white-box, C – integration
(5) A – white-box, B – system, C – integration

25. A bank is replacing its core banking software with a Commercial-Off-The-Shelf (COTS) package. Which of the following statement(s) is/are correct?

A – Parallel deployment is recommended, because a failure of the system would be critical.
B – Recurring licensing fees can be a cost associated with using COTS packages.
C – A COTS package will always match the bank's existing business processes without any customization.

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

26. Consider the following **descriptions** of three database **models** X, Y and Z:

Model	Description
X	Data is organized as a collection of interconnected records, where a record may participate in multiple parent-child relationships.
Y	Data is organized using parent-child relationships, where each child node has only one parent node.
Z	Data is organized into a group of collections of logically related records, where records are related to one another through shared attribute values.

Which of the following correctly identifies Models X, Y, and Z respectively?

(1) Hierarchical, Network, Relational
(2) Relational, Hierarchical, Network
(3) Network, Relational, Object-Relational
(4) Object-Relational, Hierarchical, Relational
(5) Network, Hierarchical, Relational

27. Which of the following statements is **always** true regarding PRIMARY KEY and UNIQUE constraint in a relational database?

(1) A PRIMARY KEY and a UNIQUE constraint both enforce uniqueness, but only a PRIMARY KEY can be used to identify tuples in a relation.
(2) A relation may contain multiple UNIQUE constraints, whereas it can contain only one PRIMARY KEY.
(3) A UNIQUE constraint is used to establish relationships between relations, whereas a PRIMARY KEY is only used to enforce uniqueness.
(4) A PRIMARY KEY must consist of a single attribute, whereas a UNIQUE constraint may consist of multiple attributes.
(5) A relation may contain multiple PRIMARY KEYs, whereas it can contain only one UNIQUE constraint.

28. Consider the following relation:

```
COURSE (
CourseID PRIMARY KEY,
CourseName UNIQUE,
Credits CHECK (Credits BETWEEN 1 AND 4 ))
```

Which of the following statements is correct?

(1) A course can be inserted with Credits = 0 as long as no other course has the same CourseID.
(2) The UNIQUE constraint on CourseName does not allow NULL values for CourseName.
(3) Two courses can share the same CourseName provided their CourselD values differ.
(4) The CHECK constraint on Credits ensures no two courses share the same credit value.
(5) Both CourseID and CourseName are unique attributes, but only CourseID does not allow NULL values.

29. Consider the following relation:

```
STUDENT (
StudentID VARCHAR(10) PRIMARY KEY,
NIC VARCHAR(12) UNIQUE,
Age INTEGER CHECK(Age >= 18),
Name VARCHAR(50) NOT NULL);
```

Assume that only one record has already been inserted using the following statement:

INSERT INTO Student `(StudentID = 'S001', NIC = '200012345678', Age = 20, Name = 'Saman');`

Which of the following subsequent insertions violates **only** two constraints?

(1) INSERT INTO Student ('S002', '200012345678', 20, 'Amal');
(2) INSERT INTO Student (NULL, '200012345678', 16, 'Nimal');
(3) INSERT INTO Student ('S004', '200078945612', 20, NULL);
(4) INSERT INTO Student ('S003', '200078945612', 17, 'Sunil');
(5) INSERT INTO Student (NULL, '200012345678', 20, 'Kamal');

30. Consider the following EMPLOYEE table:

EmpID	Name	Salary	DeptID
E01	Kasun	85 000	D01
E02	Dilini	72 000	D02
E03	Ruwan	75 000	D01
E04	Amaya	68 000	D03

What will be the output of the following SQL query?

```
SELECT Name, Salary
FROM EMPLOYEE
WHERE DeptID = 'DO1' AND Salary > 80000;
```

(1)

Name	Salary
Kasun	85 000

(2)

Name	Salary
Ruwan	75 000

(3)

Name	Salary
Kasun	85 000
Ruwan	75 000

(4)

Name	Salary
Kasun	85 000
Dilini	72 000
Ruwan	75 000

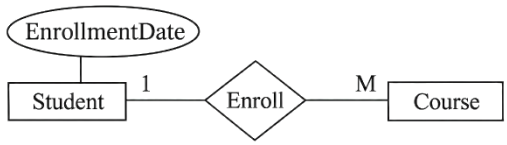
(5)

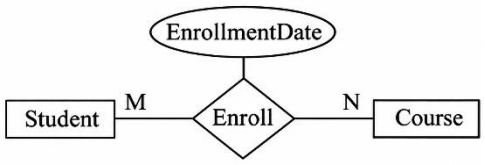
Name	Salary
Kasun	85 000
Ruwan	75 000
Amaya	68 000

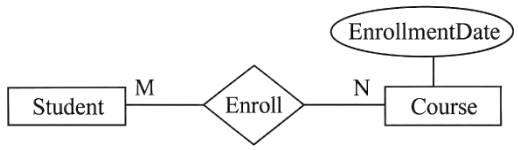
31. A university maintains information about students and courses adhering to the following requirements.

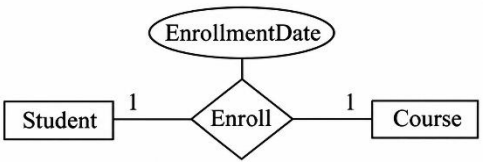
– A student may enroll in many courses.
– A course may have many enrolled students.
– The date of each student–course enrollment must be recorded.

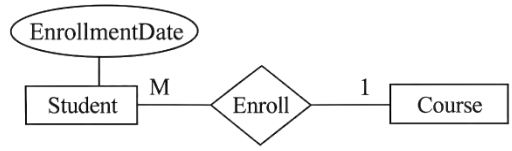
Which of the following correctly represents all of these requirements?

(1)


(2)


(3)


(4)


(5)


32. Consider the following relation:

`ORDER_DETAIL(OrderID, ProductID, CustomerID, CustomerName, ProductName, Quantity)`

Which dependency violates Second Normal Form (2NF)?

(1) (OrderID, ProductID) → Quantity
(2) OrderID → CustomerID
(3) (OrderID, ProductID) → Quantity
(4) CustomerID → CustomerName
(5) (OrderID, ProductID) → CustomerName

33. Match the **Normal Forms** labelled 0 to 3 with the corresponding **Descriptions** labelled A to D.

Normal Form
0 – 0NF
1 – 1NF
2 – 2NF
3 – 3NF

Description
A – No transitive dependencies.
B – All attributes are atomic.
C – No partial dependencies on the primary key.
D – Have repeating records.

(1) 0 – D, 1 – B, 2 – C, 3 – A
(2) 0 – B, 1 – D, 2 – C, 3 – A
(3) 0 – D, 1 – C, 2 – B, 3 – A
(4) 0 – A, 1 – B, 2 – D, 3 – C
(5) 0 – D, 1 – B, 2 – A, 3 – C

34. Which of the following statement(s) correctly describe(s) the function of a software tool used in program development?

A : Assembler → Converts object code into assembly language and produces an executable file

B : Linker → Combines object files and library routines into a single executable program

C : Loader → Executes a program, line by line during translation

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

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

35. What would be the output of the following Python expression?

```
print (5 + 2 * 3 ** 2 // 5 <= 8)
```

(1) 0 (2) 1 (3) 7 (4) True (5) False

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

```
x = 2
y = 0
for i in range(1, 3):
   j = i
   while j > 0:
      y += x
      j -= 2
   x += 1
print (x, y)
```

(1) 3 5 (2) 4 4 (3) 4 5 (4) 4 6 (5) 5 9

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

```
def update(quantities):
   quantities[1] = 50

def restock (quantities):
   for i in range(2):
      quantities[i] += 10

stock = [5, 10, 15]
update(stock)
restock(stock)
print(stock)
```

(1) [5, 50, 15]

(2) [15, 20, 25]

(3) [15, 60, 15]

(4) [15, 60, 25]

(5) Errors occur during execution

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

```
student = ("Saman", 1 , 20)
record = {"ICT": student[2],"Age": student[1],"Name": student [0]}
record["ICT"] += 50
mark_list = [record["Name"],record["ICT"]]
new_list = mark_list.copy()
new_list.clear()
new_list.append(100)
print(mark_list, new list)
```

(1) ['Saman', 70] [100]

(2) ['Saman', 67] [100]

(3) ['Saman', 20] []

(4) [] [100]

(5) ['Saman', 70] ['Saman', 70, 100]

39. Correctly match the given **Python Variable Values** labelled A to D to the correct **Data Structures** labelled 1 to 4.

Label	Python Variable Value
A	"My Name"
B	[10, 20, 30]
C	(10, 20, 30)
D	{"B": 85, "A": 90}

Label	Data Structure
1	List
2	Dictionary
3	Tuple
4	String

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

40. Consider the following pseudocode:

```
START
    n:= 5
    REPEAT
        PRINT n
        n:= n - 2
    UNTIL n < 1
STOP
```

Which of the following Python code correctly represents the above pseudocode?

(1)
```
n = 5
while n < 1:
    print (n)
    n -= 2
```

(2)
```
n = 5
while True:
    print (n)
    n -= 2
    if n > 1:
       break
```

(3)
```
n = 5
while n >= 1:
    n -= 2
    print (n)
```

(4)
```
n = 5
for i in range(5):
    print(i)
```

(5)
```
n = 5
while n >= 1:
    print(n)
    n -= 2
```

41. A software development company is designing websites for four clients:

Client	Requirement
P	Allow customers to view restaurant menu items and location details.
Q	Allow customers to purchase products online using credit cards.
R	Allow display of daily weather forecasts to interested users.
S	Allow university students to check examination results after logging in.

Which of the above websites must implement both secure user authentication and encrypted communication as primary requirements?

(1) P and Q only (2) P and S only (3) Q and R only
(4) Q and S only (5) R and S only

42. Match each HTML code segment with its functionality.

Code Segment

A : `<a href="gallery/photos.html">Gallery</a>`
B : `<a href="../index.html">Home</a>`
C : `<a href="https://www.nie.ac.1k">NIE</a>`
D : `<a href="#services">Services</a>`

Functionality

1. Creates a hyperlink to another section of the same webpage.
2. Creates a hyperlink to a webpage in a parent directory.
3. Creates a hyperlink to a webpage in a subdirectory.
4. Creates a hyperlink to an external website.

Which of the following is correct?

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

43. Consider the following HTML code segment.

```
<p class="notice">Examination begins tomorrow.</p>
```

Which of the following CSS selector correctly applies styles only to the above paragraph?

(1) #notice (2) .notice (3) notice (4) p#notice (5) *notice

44. Consider the following HTML and CSS code segments, and statements A, B, and C about the resulting web page.

```
<h1 id="heading">University</h1>
<p class="text">Faculty of IT</p>
<p id="special" class="text">
Department</p>
```

```
#heading{color: red;}
.text{color:green;font-weight:bold;}
p{color:blue;}
#special{color:purple;}
```

A – The heading “University” appears in red.
B – The text “Faculty of IT” appears in green and bold.
C – The text “Department” appears in purple and bold.

Which of the above statement(s) is/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

45. Consider the following HTML code segment:

```
<!DOCTYPE html>
<html>
<body>
<dl>
   <dt>HTML</dt>
   <dd>HyperText Markup Language</dd>
</dl>
<body>
<html>
```

What would be the output displayed in the web browser?

(1) HTML
HyperText Markup Language

(2) 1. HTML
1. HyperText Markup Language

(3) ● HTML
● HyperText Markup Language

(4) ● HTML
1. HyperText Markup Language

(5) 1. HTML
● HyperText Markup Language

46. Consider the following PHP statement:

```
$conn = mysqli_connect("1", "2", "3", "4", "5",);
```

Which of the following correctly identifies the parameters in the order they are passed to the `mysqli,connect` function?

(1) 1 – Server Name, 2 – Password, 3 – Database Name, 4 – Username
(2) 1 – Server Name, 2 – Username, 3 – Database Name, 4 – Password
(3) 1 – Database Name, 2 – Username, 3 – Password, 4 – Server Name
(4) 1 – Username, 2 – Password, 3 – Database Name, 4 – Server Name
(5) 1 – Server Name, 2 – Username, 3 – Password, 4 – Database Name

47. A microcontroller-based development board is used to build an embedded system. Correctly match the Components, labelled from A1–A3 with the Board features labelled from B1–B3:

Label	Component
A1	LDR
A2	LED
A3	Reed switch on a door

Label	Board feature
B1	Analog input
B2	Digital input
B3	Digital output

(1) A1 – B1, A2 – B2, A3 – B3
(2) A1 – B1, A2 – B3, A3 – B2
(3) A1 – B2, A2 – B3, A3 – B1
(4) A1 – B2, A2 – B1, A3 – B3
(5) A1 – B3, A2 – B1, A3 – B2

48. Which of the following regarding embedded systems and IoT is correct?

(1) A piezo buzzer can be used as an actuator in an IoT application.
(2) A reed switch can be used both as a sensor and an actuator in an IoT application.
(3) An ethernet shield connected to an Arduino Uno communicates with it via the analog pins A1 to A4.
(4) An LDR is a type of diode which changes its resistance based on the intensity of light falling on it.
(5) A microprocessor is a single chip containing a CPU, memory, I/O ports, and other peripherals.

49. In regular computers, data is stored as bits that can only be either 0 or 1. Quantum computers use 'qubits' instead. What makes a qubit different and unique compared to a regular bit?

(1) A qubit is physically much larger and heavier, allowing it to store massive files like movies faster.
(2) As qubit operates without using any electricity, Quantum Computers do not need an electrical power supply.
(3) A qubit can exist in a state called superposition, that means it can represent 0, 1, or a combination of both at the same time.
(4) A qubit automatically deletes any viruses on the computer before they execute.
(5) A qubit can physically change the colour of the computer display screen based on the user's mood.

50. In a multi-agent system, which of the following explains a key feature of how these agents operate?

(1) They all share one single central computer that tells every agent exactly what to do at every microsecond.
(2) They are not allowed to talk to each other and will automatically shut down if they detect another agent nearby.
(3) Each agent makes its own independent decisions based on what it can sense around it, and they communicate with each other as necessary.
(4) They can work only if a human manager manually types in commands for every single step they take.
(5) They are designed to physically take over the user's keyboard and mouse during an emergency.

* * *