

Practice Test

General Certificate of Education (Adv. Level) Examination 2024

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Information & Communication Technology I

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Two hours

Instructions:

* Answer all questions.

* In each of the questions from 1 to 50, pick one of the alternatives from (1), (2), (3), (4), (5) which is **correct or most appropriate**.

* Use of calculators is not allowed.

- Which of the given statements is/are **correct** with regard to history of computer?
A – John Mauchly and J.Presper Eckert created the ENIAC.
B – Maurice Wilkes created the very first computer EDSAC with the stored program concept.
C – Ultra Large Scale Integrated Circuits (ULSIC) were used in the 5th computer generation.
(1) A only (2) B only (3) C only (4) A and B only (5) A, B and C
- Which of the following computer memories are set in descending order of memory capacity?
(1) Floppy disk, Compact disc, DVD, Register, L1 cache
(2) L3 cache, Floppy disk, Register, L1 cache
(3) Primary memory, Floppy disk, L3 cache, Hard disk
(4) Floppy disk, Primary memory, Compact disc, L3 cache
(5) Hard disk, DVD, Compact disc, Floppy disk
- What would be the output obtained if bit-wise AND and XOR operations applied on binary values 11000111_2 and 10101011_2 ?
(1) 1000001_2 , 11101111_2 (2) 10000011_2 , 01101100_2
(3) 01101100_2 , 11101111_2 (4) 01101100_2 , 10000001_2
(5) 000111000_2 , 01010100_2
- What is the decimal representation of 1011.11_2 ?
(1) 11.25 (2) 11.75 (3) 11 (4) 13.25 (5) 13.75
- What is the 2's complement representation of -53?
(1) 00110101_2 (2) 11001010_2 (3) 11001011_2 (4) 11001000_2 (5) 00110110_2
- $7E7_{16}$ is equivalent to,
A – 011111100111_2 B – 3737_8 C – 2023_{10}
(1) A only (2) B only (3) C only (4) A and C only (5) A, B and C
- A system uses a specific coded binary method to represent a text file. What is the ASCII representation of the text line in the text file,
#_Web 3

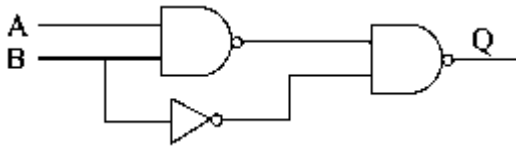
Note that the phrase ends with Line Feed.

Character	Decimal	Character	Decimal
Line Feed	10	e	101
Space	32	b	98
#	35	3	5
_	95	W	87

- $0100011\ 1011111\ 1010111\ 1100101\ 1100010\ 0100000\ 0110011\ 0000101$
- $0100011\ 1011111\ 1010111\ 1100101\ 1100010\ 0100000\ 0110011\ 0110011$
- $0100011\ 0001010\ 1010111\ 1100101\ 1100010\ 0100000\ 0110011\ 0001010$

- (4) 0100010 1011111 1010111 1101101 1100010 0100000 0110011 0001010
 (5) 0100010 1011111 1010111 1000101 1100010 0100000 0110011 0111011

8. What would be the output Q of the given logic circuit?



- (1) A (2) A' (3) B (4) B' (5) 0
9. What is the simplified expression of $(x+y')(x+y)$?
 (1) x (2) y (3) x+y (4) $x+y'$ (5) $x.y'$
10. How many valid inputs are available in a S-R latch?
 (1) 0 (2) 2 (3) 4 (4) 1 (5) 3
11. What is the simplified Boolean expression obtained from the given truth table?

A	B	C	Z
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

- (1) $A'+B$ (2) $A+B'$ (3) $A.B'$ (4) $A'B$ (5) $A+BC$
12. A program in execution is called a process. If multiple processes are set to be executed, a running process is set to go back to waiting by.
 (1) Short-term scheduler (2) Medium-term scheduler (3) Long-term scheduler
 (4) Round-robin scheduler (5) Process scheduler
13. Which of the given statements is/are **correct** with regard to process interruptions?
 A – It changes the sequence of a process in execution.
 B – Interruptions may occur when the time allocated for input and output is expired.
 C – It ends a running process and starts executing the process in line.
 (1) A only (2) B only (3) A and B only (4) A and C only (5) A, B and C
14. The block size of a hard disk is 2^{13} Bytes. A portion of the File Allocation Table of the disk at a certain point in time is given below. This table includes the file named webaru.py.
 The end of file is indicated by -1.
 The directory entry consists the information of the file blocks relevant to the file mentioned above.

100	103
101	100
102	101
103	-1
104	105
105	

- The size of the file webaru.py and directory entry respectively are,
 (1) 20KB, 102 (2) 32KB, 102 (3) 20KB, 100 (4) 20KB, 104 (5) 32KB, 103
15. Which of the following statement(s) is/are **correct**?
 A – In Manchester encoding scheme, voltage changes are done based on low to high and high to low polarity of the signal.
 B – Synchronization is used to ensure the data transmission between two networking devices.
 C – Non Return to Zero encoding scheme is used to represent the discrete voltages 0 and 1 and during a particular voltage the signal remains constant.
 (1) A only (2) B only (3) C only (4) A and B only (5) A, B and C

16. It is required to create 4 subnets with the block 192.168. 1.0/24. Each subnet requires more than 50 IP addresses. The no. of bits assigned for the network, no. of bits required to identify the subnetworks and no. of bits required to create IP addresses for each subnet in the correct order is,
(1) 24, 26, 6 (2) 24, 2, 6 (3) 24, 6, 2 (4) 26, 2, 6 (5) 26, 6, 2

17. Which of the following is **correct** about the Data Link layer in the OSI model?
A – Data is held as frames.
B – Network switch belong to this layer.
C – Consists of 2 sub layers named LLC and MAC.
(1) A only (2) B only (3) A and B only (4) A and C only (5) A, B and C

18. Which of the following is **correct** regarding Proxy server?
A – Executes certain functions done by a network firewall.
B – Stops unauthorized access to private networks.
C – Controls access to websites.
(1) A only (2) B only (3) A and B only (4) C only (5) A, B and C

19. Which of the following is **correct** about IPv4 and IPv6 addresses?
A - IPv4 is a 32-bit IP address.
B - IPv6 is a 128-bit IP address.
C – IPv4 is represented in decimal format.
D – IPv6 is represented in decimal format.
(1) A and B only (2) C only (3) A and C only (4) A, B and C only (5) A, B, C, and D

20. What is the subnet mask of D if the subnetworks are allocated as follows with the block 172.16.31.0/18?

- (1) 255.255.255.128
(2) 255.255.192.0
(3) 255.255.255.240
(4) 255.255.240.0
(5) 255.255.255.192

Subnet	Required host addresses	Allocated host addresses
B	75	126
C	26	30
D	12	14
A	10	14

21. Which of the following **correct** with regard to Ring topology?
A – Token ring ensures trustworthy data transmission.
B – Data transmission is uni-directional.
C – Each device is connected to 2 other devices closeby.
D – Cannot connect a router.
(1) A and B only (2) B and C only (3) C and D only
(4) A, B and C only (5) A, B, C and D

22. Connect the layer given with the correct statement from the next column.

Layer	Statement
Session	Uses TCP and UDP protocols
Presentation	Consists of Data frames
Data link	Performs encryption and compression
Transport	Exchanges dialogues to maintain connection between 2 ends.

- (1) P-4, Q-3, R-2, S-1 (2) P-1, Q-3, R-2, S-4 (3) P-2, Q-4, R-3, S-1
(4) P-4, Q-2, R-3, S-1 (5) P-2, Q-3, R-4, S-2

23. Which of the following could be included in a system like ChatGPT?
A – Embedded system
B – TPS
C – AI
D – KMS
(1) A only (2) C only (3) D only (4) A and C only (5) C and D only

24. Consider the following statements regarding program testing.

- A – White box testing checks the internal program codes.
- B – Test cases are used in white box testing.
- C – To perform blackbox testing, the tester does not require knowledge about the internal program structure.

Which of the above is/are **correct**?

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

25. The examination department has decided to create an online platform to receive applications for examinations. The organization that is assigned the job of creating this platform has identified the following requirements of the system.

- A – Allows applicant to select the location to sit for the examination.
- B – There should be process to accept applications of impaired students.
- C – Allows applicant to select maximum of 3 subjects.
- D – Portal should provide 24 * 7 service

Which of the above can be considered as functional requirements?

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

26. Consider the following statements regarding Data Flow Diagrams.

- A – Two external entities can communicate directly.
- B – An external entity can communicate directly with a data store.
- C – Two data stores can be connected directly.
- D – A process and a data store can be connected directly.

Which of the above is/are **correct**?

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

27. A system has requirements that are not considered complex and can be developed within a short span of time. In order to develop this system, a group of functional modules are set to be developed in parallel and codes used on previous systems are reused for this purpose. What type of development model is being used here?

- (1) Waterfall model (2) Spiral model (3) Unified development model
(4) Agile model (5) Rapid Application development model

28. As publication cost has increased over the years, the education ministry has decided to copy soft copies of text books in computer laptops. To initiate this process, the ministry has selected certain schools in a couple of districts and has started distributing the laptops with the textbook resources installed. What type of system deployment method is used here?

- (1) Direct (2) Parallel (3) Phased (4) Pilot (5) Project

29. Which symbol is used to specify a derived attribute in ERD?



• Consider the given table named EMPLOYEE that belongs to XYZ company to answer questions 30 and 31.

EMP_NO	EMP_NAME	GENDER	SALARY	APPOINTED_DATE
0001	Kasun	Male	57250.00	2019-01-01
0002	Ruwani	Female	46672.25	2020-12-01
0003	Kamal	Male	75618.00	2015-01-01
0004	Maleesha	Female	40000.00	2021-01-05
0005	Dasun	Male	60125.75	2018-06-01

30. The company has decided to increase the employees' salaries from 25%. What would be the correct SQL statement to perform this action?

- (1) UPDATE EMPLOYEE SET SALARY = SALARY*0.25;
- (2) UPDATE SALARY SET EMPLOYEE=SALARY*0.25;
- (3) UPDATE EMPLOYEE SET SALARY=SALARY+SALARY*0.25;
- (4) UPDATE SALARY SET EMPLOYEE=SALARY+SALARY*0.25;
- (5) ALTER EMPLOYEE SET SALARY=SALARY+SALARY*0.25;

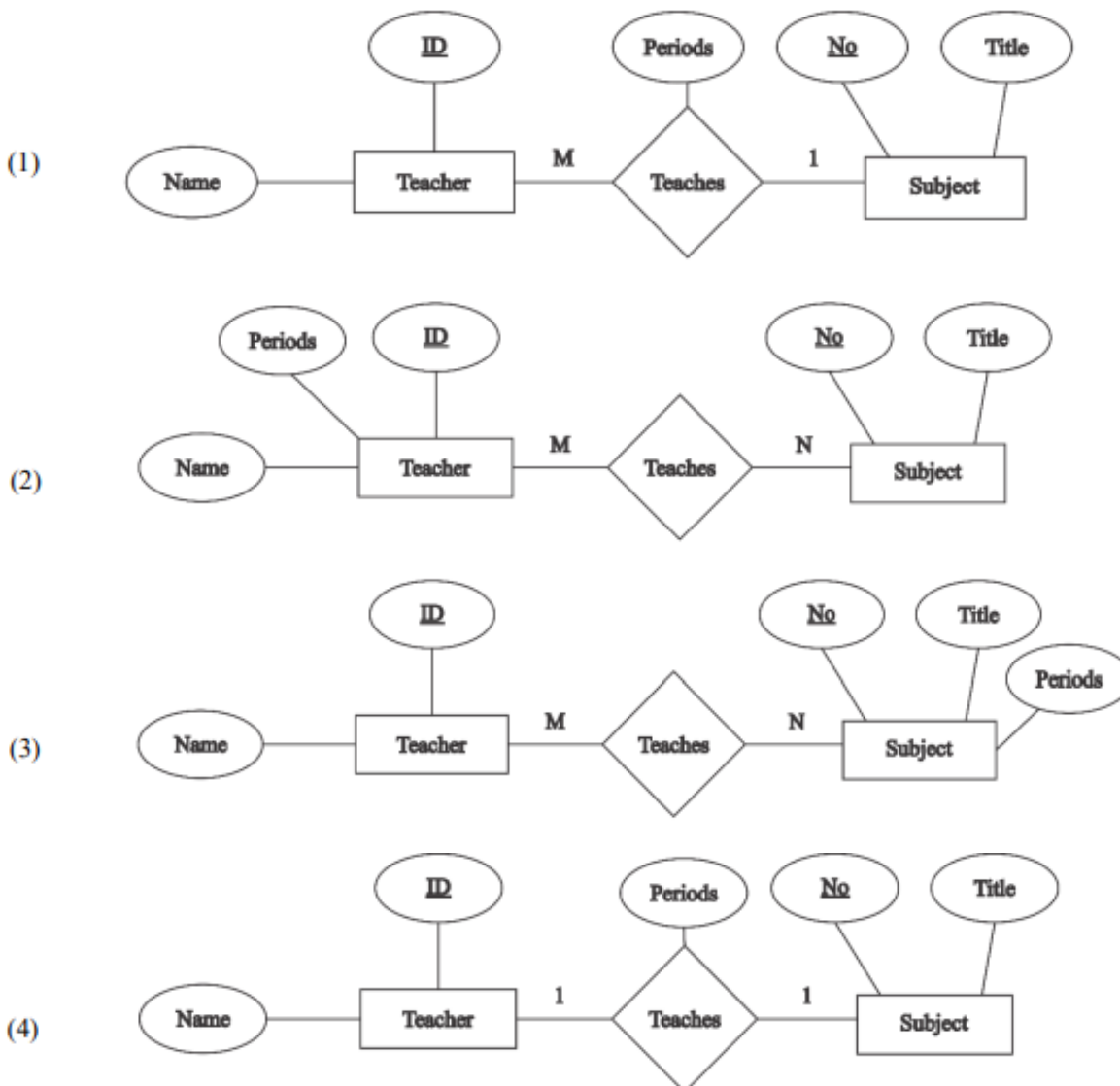
31. What would be the SQL statement that you can use to find the date of the oldest employee?

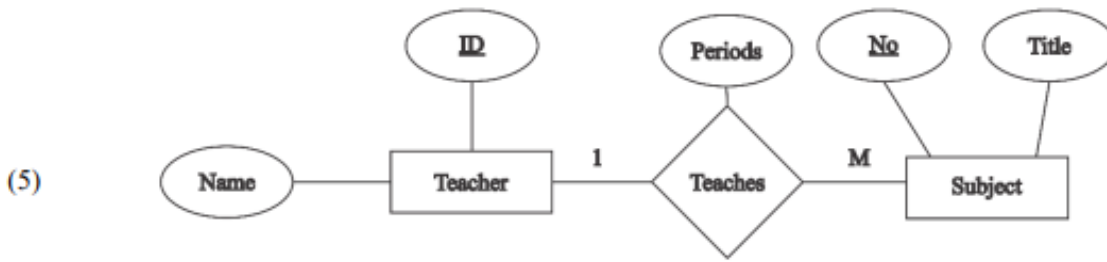
- (1) SELECT APPOINTED_DATE FROM EMPLOYEE;
- (2) SELECT MAXIMUM(APPOINTED_DATE) FROM EMPLOYEE;
- (3) SELECT MAX(APPOINTED_DATE) FROM EMPLOYEE;
- (4) SELECT MINIMUM(APPOINTED_DATE) FROM EMPLOYEE;
- (5) SELECT MIN(APPOINTED_DATE) FROM EMPLOYEE;

• Consider the following to answer questions 32 and 33.

A **Teacher** has a unique (ID) and a (Name). Each **Subject** has a unique (No) and also a (Title). A subject is taught by many teachers. Each teacher only teaches, one specific subject. A no. of (Periods) is also allocated for a teacher to teach a particular subject.

32. What is the **correct** ER diagram that represents the above scenario?





33. Select the **correct** relational schema that represents the above scenario.

- (1) Teacher (ID, Name), Subject (No, Title), Teaches (ID, No, Periods)
- (2) Teacher (ID, Name), Subject (No, Title), Teaches (ID, No, Periods)
- (3) Teacher (ID, Name), Subject (No, Title), Teaches (ID, No, Periods)
- (4) Teacher (ID, Name), Subject (No, Title, Periods)
- (5) Teacher (ID, Name, No, Periods), Subject (No, Title)

34. Consider the given statements regarding normalization.

A – A relation in 2NF may have a composite key.

B – If non-prime attributes of a relation does not depend on the primary attribute, then the relation is in 2NF.

What can you derive from the above statements?

- (1) Both A and B are correct. Statement B justifies statement A.
- (2) Both A and B are correct but, the statements A and B have no relationship whatsoever.
- (3) A is correct while B is incorrect.
- (4) A is incorrect while B is correct.
- (5) Both A and B are incorrect.

35. What is the output of the following python code?

```
numbers = [1, 2, 3, 4, 5]
squared = [x**2 for x in numbers if x%2 ==0]
print (squared)
```

- (1) [1, 4, 9, 16, 25]
- (2) [4, 16]
- (3) [1, 9, 25]
- (4) [2, 4]
- (5) [1, 3, 5]

36. What is the output of the following?

```
def mystery_function(x):
    if x == 1:
        return 1
    elif x%2 == 0:
        return mystery_function(x//2)
    else:
        return mystery_function(3 * x + 1)
print (mystery_function(6))
```

- (1) 1
- (2) 6
- (3) 11
- (4) 3
- (5) 7

37. What would be the output of the given code?

```
result = []
for i in range (1, 5):
    for j in range (i, 5):
        if j % i == 1:
            break
        result.append ((i, j))
print (result)
```

- (1) [(1, 1), (1, 2), (1, 4)]
- (2) [(2, 3), (3, 4)]
- (3) [(1, 2), (2, 3), (3, 4)]
- (4) [(1, 2), (1, 3), (2, 3), (3, 4)]
- (5) [(1, 1), (1, 2), (1, 3), (1, 4), (2, 2), (3, 3), (4, 4)]

38. Which of the following codes would produce the value 8.5 of variable S as a float?

S = 'Python 3.8.5'

- (1) version = float (S[-5:])
- (2) version = float (S.split() [1])
- (3) version = float (S.split('.')[1:])
- (4) version = float (S[8:])
- (5) version = float (S[9:])

39. Consider the python expression $x = 5 + 3 >> 2$.

A – (+) is done before right shift (>>).

B – Right shift (>>) is done before (+).

C – 5+3 produces 8 and 8>>2 produces 2. Therefore the final output would be 2.

- (1) Only A is correct.
- (2) Only B is correct.
- (3) Only C is correct.
- (4) Both A and B are correct
- (5) Both A and C are correct.

40. Consider the following statements regarding Compilers and Interpreters.

A – During translation, compiler creates an object code and the interpreter executes it later.

B – Interpreter takes each instruction written using a programming or scripting language and translates.

C – Compilers executes the source code line by line and is slower than the interpreter.

- (1) Only A is correct
- (2) Only B is correct.
- (3) Only C is correct
- (4) Both A and B are correct
- (5) Both A and C are correct

41. Which python code can be used to output the values in the given list one by one?

matrix = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]

- (1) for row in matrix:
 for element in row:
 print (element)
- (2) for row in matrix:
 row_str = str (row)
 print (row_str, end= “ “)
- (3) for i in range (len(matrix)):
 element = matrix[i][i]
 print (element, end= “ “)
- (4) for row in matrix:
 row_elements = []
 for element in row:
 row_elements.append (str (element))
 print (“ “.join (row_elements), end= “ “)
- (5) for i in range (len(matrix)):
 for j in range (len (matrix)):
 element = matrix[j][i]
 print (element, end= “ “)

Consider the following flowchart to answers questions 42 and 43.

42. Which of the following is **correct**?

A – According to the above algorithm, n and s are inputs.

B – This algorithm executes 5 times.

C – The output of the above algorithms is given below.

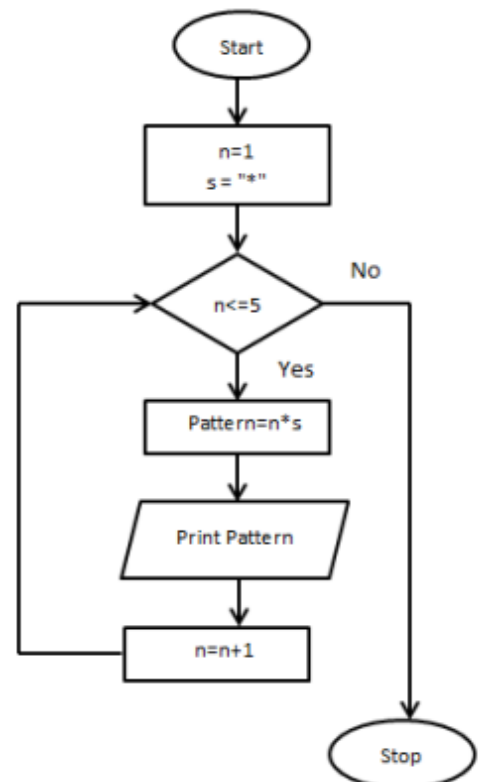
```

*****
*****
***
**
*
    
```

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

43. If the condition $n \leq 5$ in the above algorithm is modified as $n < 5$, what would be the last output line?

- (1) *
- (2) Empty space
- (3) **
- (4) ****
- (5) *****



44. Given below is an incomplete code of a system that illuminates a light emitting diode. Select the **correct** line of code to complete the program given below.

```
int LED = 9;
int brightness = 0;
int fading = 5;

void setup( ){
    pinMode (LED, OUTPUT);
}
void loop( ){
    analogWrite (LED, brightness);
    .....;
    delay (25);
    if (brightness == 0 || brightnesws == 255){
        fading = -fading;
    }
}
```

- (1) brightness = brightness + fading;
- (2) brightness = brightness - fading
- (3) brightness != brightness + 5
- (4) brightness = brightness + fading
- (5) brightness = LED + fading;

45. To find information about a particular product on the web, a user makes a request to an interface agent. In order to get the requested information, the interface agent sends the request to a broker agent and the broker agent gets requested information from 3 information agents and extracts the information that satisfies the user’s request.

According to the above scenario, which agent(s) is/are considered as self-autonomous agents?

- (1) Interface agent
- (2) Broker agent
- (3) Information agent
- (4) User agent and broker agent
- (5) Broker agent and information agent

46. Consider the statements provided with regard to AI.

- A – Multi-agent system used to solve a complex problem is an application of swarm intelligence.
- B – Nano technology is said to be used in the near future with the technology used in evolutionary computing.
- C – In an auto pilot system where there is no pilot on the flight, to ensure safe landing, neural networks can be used.
- D – Software development projects have been initiated to find treatments for deadly viruses based on artificial immune systems used incorporated with quantum computing.

Which of the above is/are **correct** regarding Nature inspired computing?

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

47. Which code is used to link the **style.css** stylesheet to the **index.html** webpage?

- (1) <style>@import url(“style.css”)</style>
- (2) <link rel = “stylesheet” href = “style.css”>
- (3) <link rel = “stylesheet” href= “style”>
- (4) <link rel = “style.css” href = “stylesheet”>
- (5) <style>@import src(“style.css”)</style>

48. Which of the following specifies the type of CSS selectors accurately?

- A - .gict {color: orange;}
- B - #gict {color: green;}
- C - h1, p { color: red;}

- (1) Class, ID, Group
- (2) ID, Class, Group
- (3) Class, Class, Group
- (4) ID, Group, Class
- (5) ID, ID, Group

49. What would be an output produced by the PHP code given below?

```
<?php
$items = array (
    array ("CR Books", 10, 5),
    array ("Eraser", 5, 3),
    array ("Pencil", 15, 8),
    array ("Marker", 10, 3)
);
echo $items[0][0]. ": In stock: " . $items[0][1] . ", sold: " . $items[0][2] . "<br>";
echo $items[1][0]. ": In stock: " . $items[1][1] . ", sold: " . $items[1][2] . "<br>";
echo $items[2][0]. ": In stock: " . $items[2][1] . ", sold: " . $items[2][2] . "<br>";
echo $items[3][0]. ": In stock: " . $items[3][1] . ", sold: " . $items[3][2] . "<br>";
?>
```

- (1) CR Books: In stock: 10, sold: 3.
- (2) Eraser: In stock: 5, sold: 3
- (3) Pencil: In stock: 10, sold: 8.
- (4) Marker: In stock: 10, sold: 3.
- (5) Marker: In stock: 10, sold: 3

50. The following is an incomplete PHP code which connects a database named **mydb** using the **mysqli** procedural method. Select the correct phrases for the blanks in the code.

```
<?php
$conn = new mysqli (localhost, root, abc@123, mydb);
if ( ..... -> connect_error) {
    die ("Connection failed: " . $conn -> connect_error);
}
..... = "INSERT INTO student (firstname, lastname, email, telno)
VALUES ('aruna', 'herath', 'wenaru@gmail.com', '0776906252')";
if ($conn->query($sql) === TRUE){
    echo "New record created successfully";
}else{
    echo " Error: " . $sql . "<br>" . $conn->error;
}
$conn->close();
?>
```

- (1) \$conn, \$sql
- (2) mysqli, create
- (3) \$sql, \$conn
- (4) \$connection, \$sql
- (5) \$sql, \$conn