Royal College - Colombo 07

Grade 13

20 | E | 1

Third Term Test – 2023
Information & Communication Technology- I

Time : 2 hours

Select the most correct answer

Name :- ..... Class : -..... Index no :- .....

1) Which of the following Statements are correct regarding Memory?

A-DRAM is needed to be refreshed periodically.

B-All the magnetic storage devices are random access with a large memory capacity.

C-Life span of Optical disks are very low lower than solid state devices

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

(4) B& C only (5) All correct

02) Which of the following software is programmed with specific data when it is manufactured?

(1) Registers (2) ROM (3) Cache Memory (4) RAM
(5) SDD

03) When creating a password for a user account the user is asked to create eight-digit password including both numbers and letters. Which of the following data validation method(s) is/are most appropriate?

A- Format Check B- Character set C- Type Check D- Length Check

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

04)----------data processing refers to the ability to collect, process, and analyze data as it is generated. This means that data can be processed and made available for use almost instantly.

1) Batch Processing 2) Real Time Processing 3) Offline Processing
4) Machine Processing 5) Manual processing

05) Which of the following statements are correct regarding Memory.

A..SRAM density is higher than DRAM.

B. DRAM is needed to be refreshed Periodically.

C. Register and Cache memory used as SRAM.

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(1) A Only (2) A and B Only (3) A and C Only (4) B and C Only

(5) All A, B and C

06) What is the correct order of terms used to introduce above statements?

(1) Phishing, Piracy, Plagiarism

(2) Piracy, Phishing, plagiarism

(3) Plagiarism, Phishing, Piracy

(4) Phishing, Theft, Intellectual Property Laws

(5) Piracy, Phishing, Intellectual Property Laws

07) Select the correct statement / statements from the following statements.

A. Enabling the equalization of technical resources is a solution to digital division.

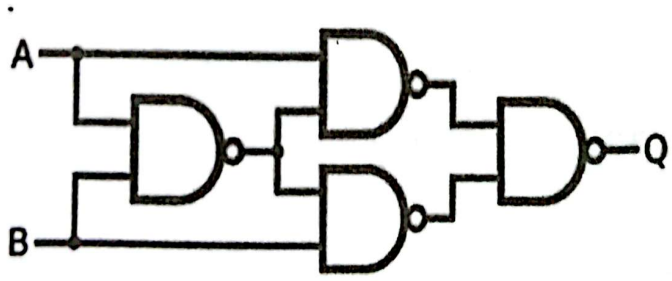
B. The digital divide is the economic and social equilibrium of access, use or impact of ICT.

C. Firewall installation can be done as a remedy for phishing.

(1) A Only (2) A and B Only (3) A and C Only (4) B and C Only

(5) all A, B and C

08) Which of the following Logic gate represents the function of given logic circuit.



1) AND Gate (2) NAND Gate (3) OR Gate (4) NOR Gate (5) XOR Gate

09) What is the correct HTML for adding a background color?

(1) <background>yellow</background>
(2) <body background="yellow">
(3) <body bgcolor="yellow">
(4) <body style="background-color:yellow;">
(5) <body bgcolor="yellow">body style="bg-color:yellow;">

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10) Two's Complement of (+11) and (-8) are respectively,

(1) 00001011_2, 00001000_2
(2) 11111011_2, 11110111_2
(3) 00001000_2, 11111010_2
(4) 00001011_2, 11111000_2
(5) 11111000_2, 00001011_2

11) What is the incorrect statement about Flip-Flops?

(1) R-S (Reset Set) flip flop is the simplest flip flop of all and easiest to understand.
(2) Flip flops can also be considered as the most basic idea of a Random-Access Memory.
(3) One form of flip-flop acts exactly like the power switch on a computer.
(4) The two inputs are called the Set and Reset input
(5) Flip Flop can be made simply by cross coupling two inverting gates either AND or OR gate could be used.

12) Steps of designing a digital circuit to solve a real world problem is given below.

A-K-Maps are used to simplify the equations.
B-The truth table is developed.
C-implemented using logic gates.
D-The Problem is analyzed.
E-Identify input variables and output variables.
Find the correct order of execution. Select one

1) D -E-B-A-C 2) A-C-B-D-E 3) D-A-B-E-C
4) B-D-E-C-A 5) A-C-E-B-D

13) Devices on one network can communicate with devices on another network via

A.-Router
B.-Hub
C.-Gateway
D-Multiplexer

14) The_____ layer uses data compression yo reduce the number of bits to be transmitted.

1) Presentation 2). Network 3) Data link 4) Application
5) Transport

15) Which subnetwork address does host 172.16.82.229/25 belong to?

1) 172.16.82.128 2) 172.16.82.32 3) 255.255.255.128
4) 172.16.82.0 5) 255.255.255.0

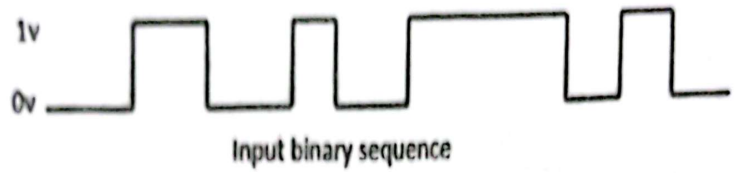
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16) What is the last valid host on the subnetwork 172.25.84.0/23?

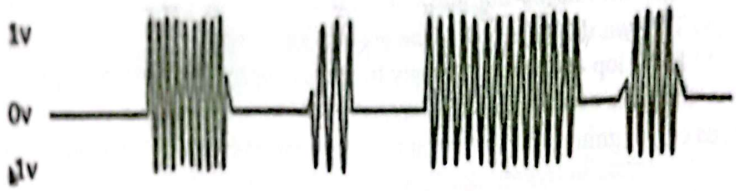
1) 172.25.85.128 2) 172.25.85.254. 3)172.25.85.255

4) 172.25.85.0 5)172.25.255.255

17) Consider the following modulation technique.



Input binary sequence



Which of the above is correct?

1) AM- Amplitude Modulation 2) FSK – Frequency Shift Keying

3) PSK- Phase Shift Keying 4) FM -Frequency Modulation

5) ASK – Amplitude Shift Keying

18)

Which of the following statements is incorrect?

A- Non-return to Zero Level (NRZ-L): is an encoding scheme in which two different voltages for 0 and 1 bits are used to represent data and remain constant during a bit interval

B- Manchester encoding: in Manchester encoding voltage changes from low to high or high to low in the middle of the signal.

C- Non-return to Zero Inverted (NRZ-I): in this encoding scheme, in which a "1" is represented by a transition of the physical level, while a "0" has also transition.

Which of the above is/are incorrect?

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

5) A,B and C All

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Past Papers Wiki

19) $7B_{16} + 10111_2 =$

(1) 146 (2) 83_{16} (3) 123 (4) 140_{16}

(5) 102_8

20) $11F5_{16} - A0C_{16}$

(1) $9E7_{16}$ (2) $8E3_{16}$ (3) $7D9_{16}$ (4) $8F9_{16}$

(5) $7E9_{16}$

21) What is a sensor in an IoT device?

A - A sensor is a physical object that detects and responds to input from its surrounding environment, essentially reading the environment for information

B- The information that a sensor gathers is typically transmitted electronically to other components in an embedded system.

C- Collect sensor data, translate protocols, and process sensor data, all at the edge of the network, before sending it on the cloud.

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) all A, B and C

22) Which of the following is true about Arduino IoT devices software?

(1) They are open-source software

(2) They can only read analog inputs

(3) They have their own operating systems

(4) They don't have pre-programmed firmware

(5) none of the mentioned

23) Select the correct simplified answer for the given Boolean expression.

F = (A+B').(A'+B).(A+B)

(1)0 (2) 1 (3) AB (4) A (5) B

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24) Which of the following is the correct syntax to change the background-color of all paragraph elements to yellow?

1). p{background-color:#yellow;}

2). p{background-color:yellow;}

3). all{background-color:yellow;}

4). p{background-color:*yellow;}

5) . p{bgcolor:yellow;}

25) A common approach to normalization is to divide the larger table into smaller tables and link them together by using relationships. Which of the following statements is false regarding normalization in a database?

(1) A single-valued attribute can only be stored in a table if it's in 1NF.
(2) All attributes other than the primary key are fully functional in the 2NF.
(3) Data duplication is reduced by using 3NF.
(4) A functional dependency is a relationship between or among tuples (records).
(5) Relational must belong to 1NF in the 2NF.

26) Consider the relationship **R (A, B, C, D, E)** with the following dependencies:
A-> [B, C, D, E]
D-> [E]
A-> [E]
Which of the following functional dependency types is/are not present in the above scenario?

(1) Full functional dependency

(2) Partial functional dependency

(3) Transitive functional dependency

(4) Partial and Transitive functional dependency

(5) Not Sufficient information was given.

27) Consider the following SQL query and select a false statement from the given statements.

```
SELECT pets.name AS pet_name, owners.name AS owner
FROM pets
JOIN owners
ON pets.owner_id = owners.id;
```


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(1) Data Manipulation Language (DML) is used in the above code.

(2) The AS command is used to rename owners into owner.

(3) ID in the owners table is a foreign key to the pets table.

(4) This query will output pet_name and owner details.

(5) This query can't be written without using SQL JOIN clause.

28) ROLLBACK is the SQL command that is used for reverting changes performed by a transaction. Which of the following SQL commands will be reverted by the SQL ROLLBACK command?

A- TRUNCATE B- DELETE C- DROP

(1) A Only

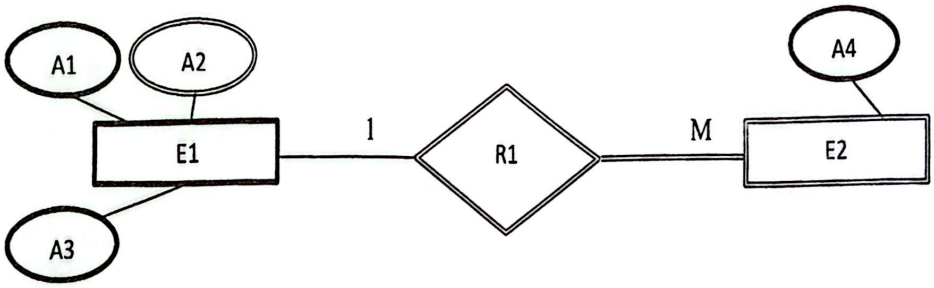
(2) B Only

(3) C Only

(4) A and B only

(5) A, B, and C all

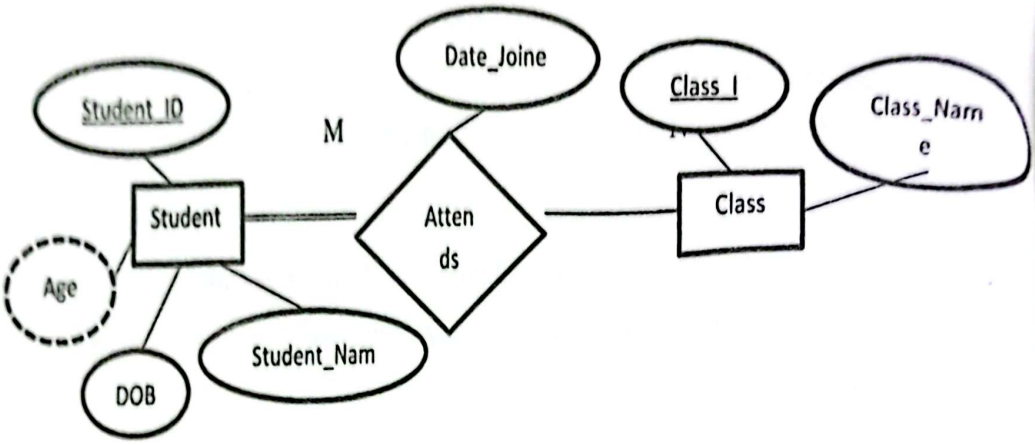
29) Find minimum number of tables required for converting the following entity relationship diagram into relational database?



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

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30) Consider the following ER Diagram



Which of the following possible relations is correct if the above ER diagram is mapped in to a relational model?

(1) Student(Student_ID,Class_ID,DOB,Student_Name)

(2) Student(Student_ID,Age,DOB,Student_Name)

(3) Attends (Student_ID, Class_ID ,Date_Joined,)

(4) Class (Class_ID,Class_Name,Date_Joined)

(5) Class(Class_ID,Class_Name,Student_ID)

31)

200	205
201	-1
202	201
203	200
204	
205	202

Consider the above segment of the linked allocation of a file. The capacity of each memory block is 5MB. Find the size and directory entry of the file.

1) 25 MB and 203 2). 30MB and 203 3). 25MB and 200 4). 25MB and 201

5) 30MB and 200

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32) The number of units of information a system can process by the processor in a given amount of time is known as

1) Turnaround Time amount
2). Throughput
3). Response time amount
4). Waiting time amount
5). Address bus width

33) If computer consist of 4GB RAM and it executes a physical memory address with the capacity of 7MB. What is the length of the offset and how many frames can be created here

1). 27 bits and 32 frames
2). 32 bits and 27 frames
3).32 bits and 2^{32} Frames
4). 27 bits and 2^{27} Frames
5). 16 bits and 27 Frames

34) While Ashen is filling online application for the University entrance and He open the whatsapp to find the school code.

Which of the following shows correct transitions of above process states

1)	Online application – Run→Ready	Whatsapp – New →Ready
2)	Online application – Run →Ready	Whatsapp – Ready →Run
3)	Online application – Run → Terminate	Whatsapp – New → Ready
4)	Online application – Run → Block and suspend	Whatsapp – Ready →Run
5)	Online application – Run → Block	Whatsapp → Ready → Run

35) Consider the following statements

- Uses an existing method and modified them to suit the requirements.
- the tasks are divided into time slices to deliver specific features for a release.
- An iterative approach and the software build is delivered after each iteration.
- Each build is an increment, and the final product contains all the functionalities that the user requested

what is the software development model which is described above?

1). iterative incremental model
2). Agile Model
3). spiral model
4). Waterfall model
5). prototyping model

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36) which of the following is/are TRUE regarding functional requirements

A. how will and within what limit the requirements should be satisfied

B. what the activities that the system should carry out.

C. Discovering Of system boundaries of the new system and how the system must interact with the new problem domain

D. It defines what the system should do in order to meet the user's needs or expectations.

E. "Response time for the user request must be less than 30 second" is an example for the functional requirement.

1). A,B and C only 2). C,D and E only

3). C and D only 4). B and D only

5). A and D only

37) Which of the following statement is/are TRUE regarding external entities

A. The sources, sinks, or actors which are outside systems that send or receive data to and from the diagrammed system.

B. Data and information can be shared between two external entities.

C. An external entity can access data stores directly.

D. data and information can be shared among external entity and the system only for one direction.

E. An External entity can have links for more than one processor.

1) A,B and E only 2). A,B and D only

3) .A,C and D Only 4). A,B,C, and E on

5.) All of the above.

Question no 38 and 39 are based on the following scenario.

Customer can make orders as well as can do payments via a safe online payment method. They purchase ingredients from Cake Mart which is situated at Peta by visiting them. Cake Mart is using a point of sale system for their transaction processing. People can do card payments other than the cash payments.

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38) Which type of organization and e- business model the Home made delight is

1) Brick and Click and E marketplace.
2) Pure Click and virtual store front
3) Pure Click and E market place
4) Brick and Click and information broker
5) Pure Brick and virtual store front

39) Which type of e - business transaction happens between customer and homemade delights.

1. B 2 B
2. B2 C
3. C 2 C
4. B 2 E
5. C 2 B

40)

R is a variable. R="My Schoolis Royal Collge". What is the output of the following python code? print(len(R), R[12:], R[18])

```
print(len(R), R[12:], R[18])
```

1. 25 Royal Collge
2). 25 oyal Collge
3. 25 Royal Collge C
4. 24 Royal Collge C
5. 24 Royal Collge

41) Consider the following python list S.

```
S=[2,4,6,8]
S.append(10)
S.append("Even Numbers")
print(S)
```

What is the output of the Python code segment?

(1). 2, 4, 6, 8
(2). 2, 4, 6, 8,10
(3). 2, 4, 6, 8, 10, 'Even Numbers'
(4). 'Even Numbers'
(5). None of the above.

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42) What will be the output of the following python code segment?

```
numbers = [2,5,-6,3,5]
for i in range(len(numbers)):
    if numbers[i] < 0:
        break
    if numbers[i] > 10:
        continue
    square = numbers[i] * numbers[i]
    print('Square of a number',numbers[i] ,'is', square)
```


```
numbers = [2,5,-6,3,5]
for i in range(len(numbers)):
    if numbers[i] < 0:
        break
    if numbers[i] > 10:
        continue
    square = numbers[i] * numbers[i]
    print('Square of a number',numbers[i] ,'is', square)
```


1)

```
Square of a number 2 is 4
Square of a number 5 is 25
```

2)

```
Square of a number 2 is 4
Square of a number 5 is 25
Square of a number 3 is 9
Square of a number 5 is 25
```

3)

```
Square of a number 2 is 4
Square of a number 5 is 25
Square of a number 3 is 9
```

4)

```
Square of a number 2 is 4
Square of a number 5 is 25
Square of a number 6 is 36
Square of a number 3 is 9
Square of a number 5 is 25
```

5)

```
Square of a number 2 is 4
Square of a number 5 is 25
Square of a number 6 is 36
Square of a number 3 is 9
```

43). What is the correct output of the following python code? (15>3)%3&7

1. 0 2. 1 3. 2 4. 3 5. 4

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44). Consider the following python statement.

Name= str(input("Enter your Name:"))

A. Data type of Name variable is string.

B. User can see the screen as "Enter your Name:"

C. Cannot assign values like this to "Name" variable

What is the correct statement about the above python statement.

1) A only 2). B only 3). C only 4). A & B only 5). B & C only

45) What is the purpose of the range() function in Python?

1) Generates a sequence of numbers

2) Calculates the factorial of a number

3) Finds the square root of a number

4) Checks if a number is prime

5) Calculates the counting of a number

46) Consider the following php codes

```
<?php
function myFunction()
{
  $x = 5;
  echo " Result1: $x , ";
}
myFunction();
echo "Result2: $x";
?>
```

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

1) Result1: 5 , Result2:

2) Result1: 5 , Result2: 0

3) Result1: 5 , Result2: 5

4) Result1: , Result2:

5) Error

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

```
<?php
$x = 1;
while ($x <= 5) {
  echo $x. " ";
  ++$x;
}
?>
```

1) 1 2 3 4 5 2) 1 2 3 4 5 3) 1 2 3 4 5 4) 1 2 3 4 5 6 5) 1 2 3 4

48) Output of following PHP code segment.

```
<?php
$House = array("Harward ", "Marsh", "Boake");
echo "I like " . $House [0] . ", " . $House [1] . " and " . $House [2] . ".";
?>
</body>
</html>
```

(1). I like House Harward, Marsh and Boke.

(2). I like [Harward], [Marsh] and [Boke].

(3). I like Harward, Marsh, Boke.

(4). I like House [0], House [1] and House [2].

(5). I like Harward, The Marsh and Boke.

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49) . What will be the output of the following Python code?

```
def san(x):
        print((3*(x-1)//x)
x=-2
x=4
sam(12)
```

1) 10 2) 0 3) 2 4) 4 5) 9

50) . Which of the following statements is/are correct regarding CSS?

A- CSS allows developers to quickly and easily control how text, images and links appear on a web page

B - There are three components in a CSS rule called as selector, property and value

C - Internal styles can be used to change the appearance of many web pages

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

5) B and C only

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20 | E | II

Grade 13
Third Term Test – 2023
Information & Communication Technology- II

Time : 3 hours

Name :- ..... Class : -..... Index no :- .....

Part A – Structured Essay

Answer all four questions on this paper itself.

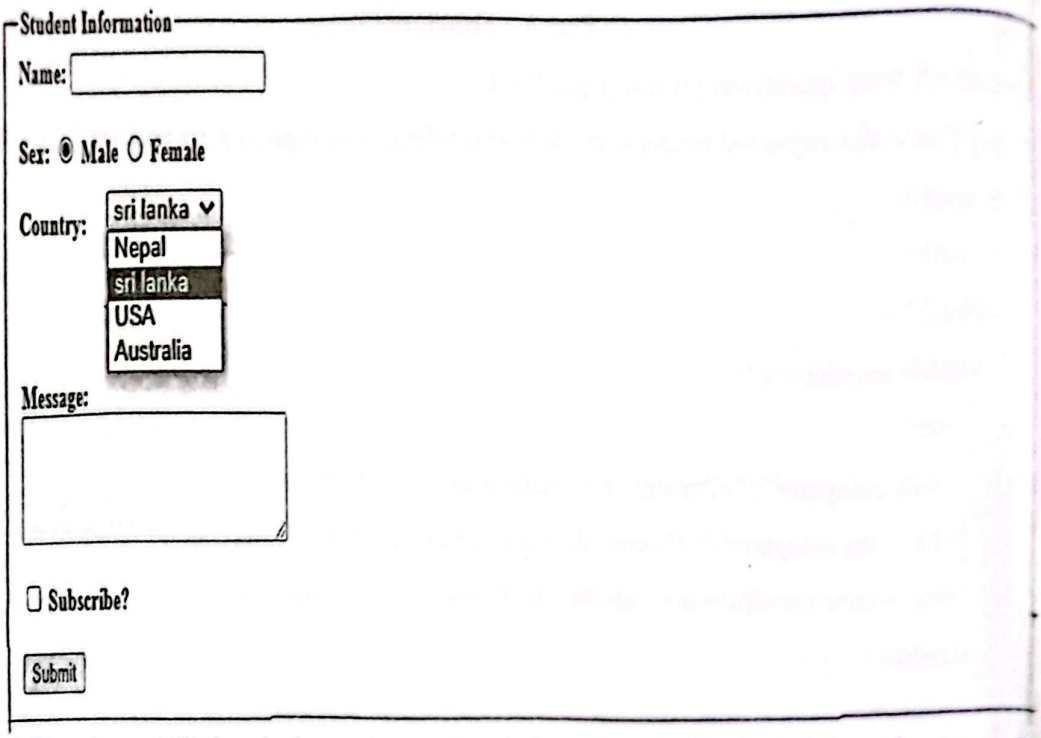
1. (a) Draw the expected output of the following HTML code segment when rendered by a web browser.

```
<html>
<bodY>
 <table border="1">
   <tr>
    <th colspan="5">Person</th>  <th rowspan="3">Id</th> </tr>
   <tr> <th colspan="2">Name</th><th rowspan="2">Age</th><th colspan="2">Job</th></tr>
   <tr><th>First</th><th>Last</th><th>Position</th><th>Age</th></tr>
  <table>
</body>
</html>
```

Note: Consider the following box as the area of the browser.

b) An output of an HTML code rendered by a browser is shown below

Your code should satisfy the following requirements. It is required to format a **H1** in Arial font and size of the Font **12 px** and color blue format that using internal CSS.



c) The relevant HTML code (incomplete) is given below. Fill in the blanks in it in order to get the required output.

```
<html>
<body>
<head>
  .....

  .....

  .....

  .....

  .....

</head>
 <body>
 <H1> Royal College Grade 12 Students</H1>
  <form action="abc.php" method="post">
   <fieldset> ,
   <legend>.....</legend>
```


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```
<input type="……..name=”submit”……." value="Submit">
</fieldset>
</form>
</body>
</html>
```

d)

Consider the following HTML script to insert new record to the a database.

The user's response is submitted to a PHP script named "index.php". Complete the following PHP code segment ("index.php") to fulfill this requirement by using given terms in brackets.

```
<!DOCTYPE html>
<html >
<head>
<title>Record Data </title>
</head>
<body>
<form action="index.php" method="POST">
Index number:<br>
<input type="text" name="index">  <br>
```


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```
Name:<br>
<input type="text" name="name"> <br>
<input type="submit" name="submit" value="Submit">
</form>
```

Filling the blanks using numbers 1,2,3 and 4. (close(),$conn,name, $sql, $_POST)

```
<?php
if(isset($_POST['submit'])){
$conn = new mysqli('localhost', 'root', 'root@1234','school');
if ( (1) ->connect_error) { die("Connection failed: " . $conn->connect_error); }
$sql = "insert into student(index,name)
values("$_POST['index']."',"'.$_POST['...2.....']."');";
if ($conn->query(...3....) == TRUE) { echo "New record inserted successfully"; }
else { echo "Error: " . $sql . "<br>" . $conn->error; }
$conn->.....4.....; } ?>
```

1-

2-

3-

4-

2) (a) There are some schedulers which are used in process transitions among main memory, CPU and the virtual memory.

(i) Read the following scenario and answer the given questions.
Rajesh starts to print a document using a computer. But the computer has stopped printing for a while that's because printing papers are over. After feeding papers to the printer the computer has started printing again.

Explain the states process transition of the process printing.

.....

.....

.....

(ii) Write the schedulers which are responsible for each process transitions.

.....

.....

.....

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(iv) The block size of disk is 2KB. A portion of its file allocation table starting from block 240 at a particular time which related to certain file is shown below. (The last block of a file indicated by -1)

240	242
241	240
242	244
243	
244	-1

(i) What is the size of the above file

.....

.....

(ii) Assume that additional improvement are made to the above file that results in its size become 10KB. Draw the File allocation table with the changes according to the purpose

.....

.....

c) Assume that a computer has only 16 MB physical memory and the page size of the in this computer is 1MB.

.....

.....

.....

(i) How many bits are required for the offset of the memory address.

.....

.....

(ii) User runs a particular program having a size of 16MB on this computer. A few selected fields of the page table of that process at the particular time are shown in the figure below.

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Page Number	Frame Number	Present/Absent
0	110	0
1	100	1
2	000	1
3	101	1
4	001	1
5	011	1
6	000	0
7	000	0

- Frame number is indicated in binary
- The present absent bit indicates the validity of the entry. If this bit is 1, the entry is valid and can be used. If it is 0, then the relevant virtual page is not I physical memory.

(a) The absent present bit of the page no 6 is "0" give one reason for it.

.....

.....

.....

(b) After few milli seconds the absent present bit of the page no 6 is changed to "1". And the frame No is changed as 111 Explain it

.....

.....

.....

(c) Assume that the virtual address of the page 6 is 110111101111011110111110 .by considering the part b what is likely the physical address that the virtual address 110111101111011110111110 will be mapped.

.....

.....

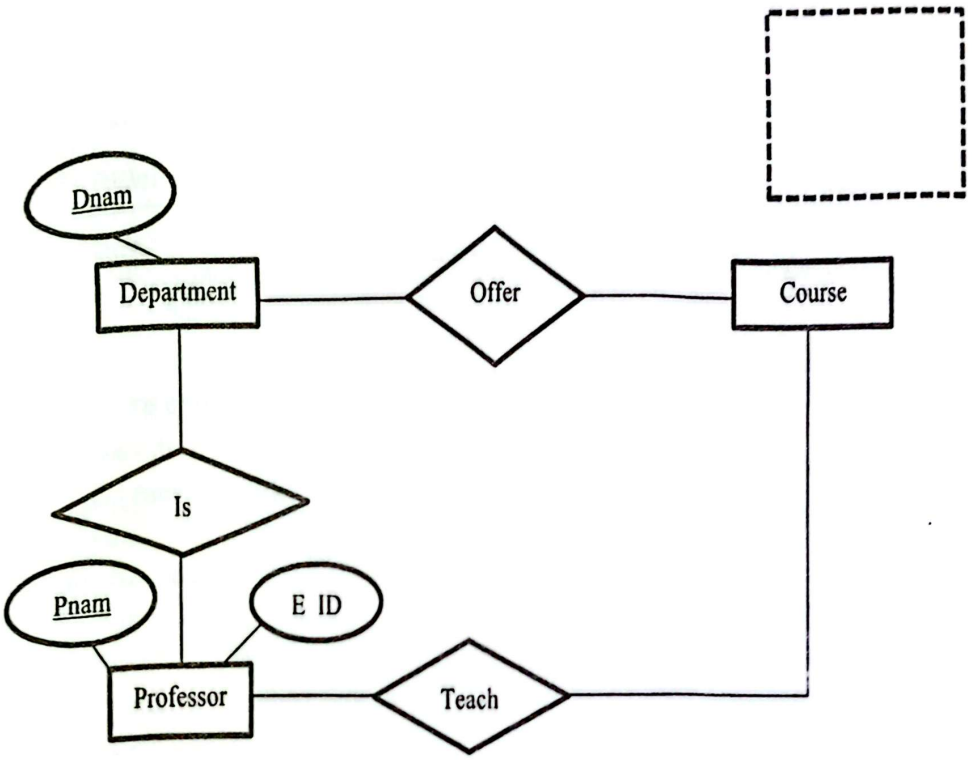
.....

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01.
(a)

Consider the Following Entity Relationship (ER) diagram for the following scenario.

The University of Royal has several departments. Each department which is identified by its name is managed by a chair, and at least one professor. The professor can be identified using the employee ID and name. Professors must be assigned to one, but possibly more departments. At least one professor teaches each course, but a professor may be on study leave and not teach any course. Each course may be taught more than once by different professors. A department offers many courses and courses can be identified using a course code which consists of a name and a unit code.



I. Draw the entity Course Code in the provided space.

In the above scenario chair is a professor who manages a department. Suggest a way to represent it in the above ER diagram and draw it on a suitable location on the ER diagram.

.....

.....

.....

.....

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II. Briefly explain the cardinality of a relationship and denote them on the above ER diagram

.....

.....

.....

III. What are participations in a relationship? Mention 2 Participation Categories and represent them on the above ER Diagram.

.....

.....

.....

IV. The following relational schema is constructed using the ER diagram shown above. In each of the tables, the field names are missing. Write appropriate field names.

Professor(.....)

Department(.....)

Course(.....)

IsAssigned(.....)

Teaches(.....)

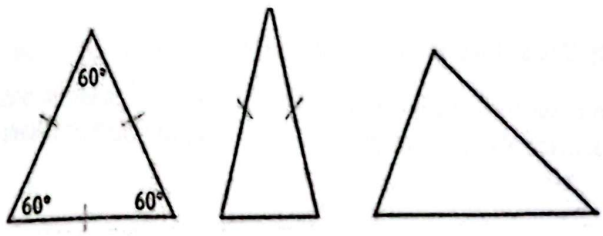
V. Write an SQL JOIN statement to display the name of the professors who are teaching the course with the name= COSC and unit code =2205.

.....

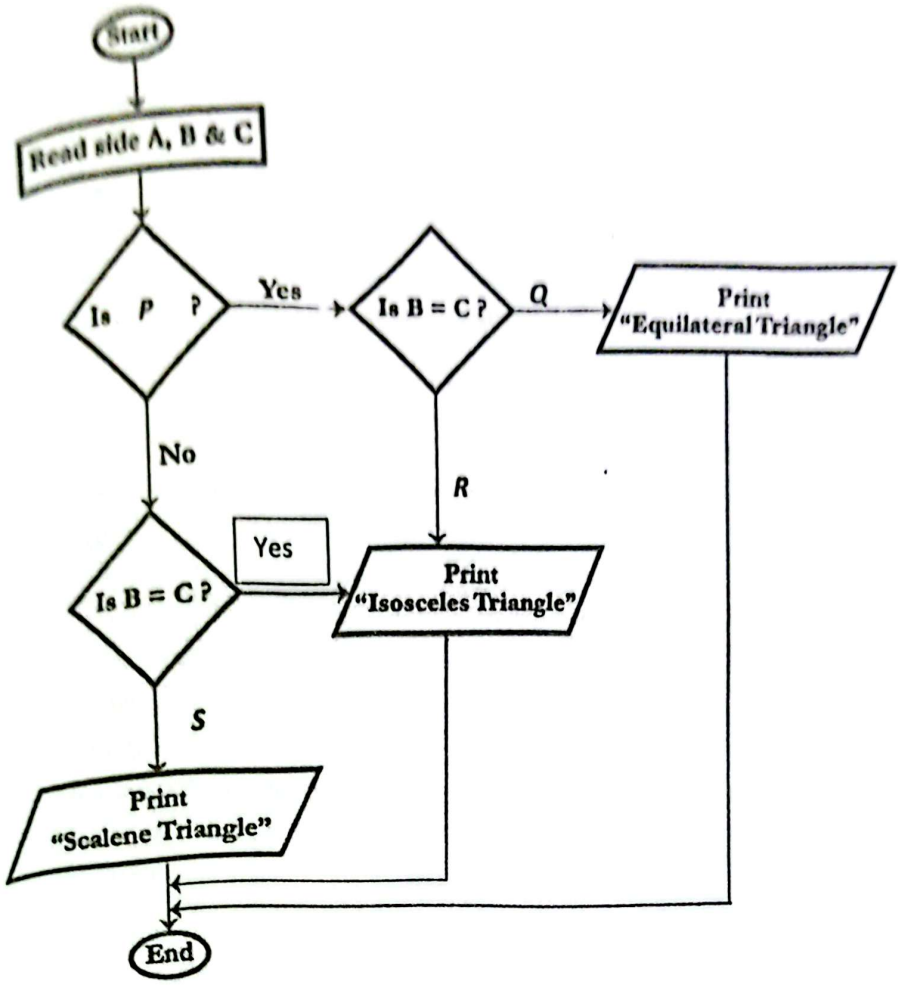
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4)



a). Lengths of three sides of a triangle A,B and C are given as inputs. The following flowchart finds if the triangle is Isosceles, Equilateral or Scalene. Filling the blanks using letters P,Q,R and S.



P - Q - R - S -

b). Consider the following python program.

```
def NumberList(k):
  if(k ==1 ):
    return 1
    print(k)
  else:
    return k*NumberList(k-1)
print(NumberList(5))
```

What is the result of the Python code?

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```
a=1;b=0;
while a < 10:
  print(b)
  a=a+1;b=a+b
  if (b>10):
    break
    print (b)
```

c). What is the output when the following code is executed?

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PART -B

What is the Difference between combinational and sequential circuit

Consider the following logical expression, Which A, B and C are the input and F is the output. **F= A' B.C + AB.C' + ABC + AB'C**

a) Give the complete truth table for the logical circuit constructed in above

Using a Karnaugh map derive a simplified SOP expression for the output F.

c) Construct a logical circuit for the above logical expression using the least number of NAND gates.

d) Using a Karnaugh map derive a simplified POS expression for the output F.

e) Construct a logical circuit for the above logical expression using the least number of NOR gates.

iii). Following is the conduct of the logic circuit of a digital system, where the inputs are X, Y, Z (three decimal values) and the output is R: If the value of X is 1 or if the value of Z is 1, the output will be 1.

a) Draw the truth table for the output R

b) Write the Boolean equation of R in Sum of Products (SoP) form.

c) Simplify the Boolean equation derived in (b) using the Boolean rules. (Rules need to be mentioned)

6)

Royal College has 4 ICT Labs in four floors. Lab1,Lab2,Lab3,Lab4 The College decides to computerize all their activities by establishing an Lab1 as fallows.

Lab	Network IP	Broadcast IP	Nodes	Subnet mask	Usable Ip Range
Lab1	192.248.5.0		16		
Lab2		192.248.5.47	32	255.255.255.224	
Lab3			64		
Lab4	192.248.5.112	192.248.5.175	64		

The network administrator has received 192.248.5.0/24 IP Address block for the organization. The IP address for the computers are to be allocated after 4 subnets from this address block for 4 buildings. The Lab1 of the College proposes the following.

- A Local Area network for each Lab in order to share specific software and resources.
- All computers to be given internet connectivity with the help of a DNS and proxy server.
- An internet service provider (ISP) to supply the internet connectivity to the Lab1
- The entire network to be protected through a firewall

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a) The IP address ranges related to each lab are shown in the table above. Copy it in your answer sheet and fill in the blanks.

b) Write down the first and last IP addresses of above IP address block.

d) Draw the network diagram to represent the logical arrangement for the College computer network that the network administrator can implement to fulfil the requirements.

e) In addition to the College is hoping to establish a new two labs namely Teacher's Lab and prefect 's Lab and there are 50 and 10 computers respectively. In this subnet find the following.

(i) Network IP

(ii) Broadcast IP

(iii) Subnet mask

(iv) Usable IP range which can be used for computers

7)

a). Consider the following python program.

```
n=5
k=5
for i in range (0,n+1):
    for j in range (k-i,0,-1):
        print(j,end='')
    print()
```

```
n=5
k=5
for i in range (0,n+1):
        for j in range (k-i,0,-1):
                print(j,end=" ")
        print()
```

i. What is the number pattern when the following code is executed?

ii. What is the output number pattern when code line number 5 change as print(i,end=" ") ?

b). What is the output of the following list operation?

```
aList = [10, 20, 30, 40, 50, 60, 70, 80]
print(aList[2:5])
print(aList[:4])
print(aList[3:])
```


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a function in python to read lines from the "RoyalFile.txt" and count how many times word "Royal" exists in file. For example, if the content file is:
Royal College, the oldest Public School in Sri Lanka lagged behind other Colleges without a College Song until Principal H. L. Reed composed and set to music 'School of Our fathers' in the Third Term of 1927. The Music was later revised by S. Schmid.

-Mart is an online recondition Vehicle buying and selling company.

Online Register front

Any person who is rich with the knowledge of motor mechanism and has enough land property which is suitable for a vehicle yard in any area of the country can register as a broker. If they wish to join with the company they have to submit their information through an online form and data are temporary store in an excel database. Later the general manager selects them through an interview and store the information of selected people in the data store called Broker_db. If a person wants to sell their vehicle to this company they have to send a request to the online register front. All requests are temporarily stored in request file. The clerk sorts all the requests according to the area and gives contact details to relevant brokers. The request file is automatically cleared atthe end of the each day.

Accounts division

The Broker can contact the vehicle owner and have a discussion about the business and if the both parties are agreed, the business can be done with all the legal activities. Then the Soft copies of the relevant documents should be uploaded to the system through online register front and originals are couriered to the general manager of the company. Soft copies are stored in the vehicle dB and hard copies are stored in vehicle information cabinet. After the vehicle is brought to the relevant vehicle yard and inform transaction details to the accounts division by the broker. money is transferred to the sellers accounts by the accounts division. Vehicle details with some photos and videos which are sent by broker are uploaded to the online register front and store them in vehicle DB..

Online vehicle catalog

If a customer wants to buy a vehicle, they have to search vehicle catalog and select the vehicles and the contact details of the broker. Online vehicle catalog is linked with databases of Vehicle DB and Broker_db. They can visit the vehicle yard and can discuss about the business with the broker. If the customer is satisfied about the vehicle, he should visit the

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company and can do all the legal and business transactions. Then the general manager informs broker that the business was success fully completed, then they allow customer to get the vehicle.

The brokers are paid a monthly allowance by the accounts division. Except that they get 2% commission for each vehicle transaction which is done by.

- Online register front, Accounts division, Online vehicle catalogue, General manager, and clerk should be considered as processes.
- You can make assumption with proper justifications.

1). Draw the context diagram to identify the system, external entities and the flow of data.

2). Draw the **level 1** DFD by clearly identifying processes, databases, and the data flows other than the external entities.

9)

a)

In a literacy agency there are authors who are recognized by an ID, name, address, and telephone number. An author has written one or more books. Every book has a title and an ISBN which is different for every book.one book can have more than one author. Authors are managed by the agents, and they are recognized by the ID, name and office number. An agent can manage more than one Author. The publisher who publishes the book is also recorded.

Sometimes authors also make appearance at a bookstore to give a reading and sign books. Appearances are recorded and identified by the date and location.

Draw an ER diagram for the above scenario. Clearly state your assumptions if any.

b)

The Kade is small business which sells bakery items only the local customers.

(i) Which type organization is applicable in this business?

(ii) What is the revenue model used in this business?

(iii) In an emergency health problem where people have to stay at home for a long period, this shop remain closed for the regular business activity. Under such circumstance this shop decides to change the organization model as the pure click. Mention an advantage and a disadvantage for the business which relevant for the above business transition.

Hint : online sales of bakery items.

Iv) Name two methods which can be used to give the publicity for the new type business of the "the kade".

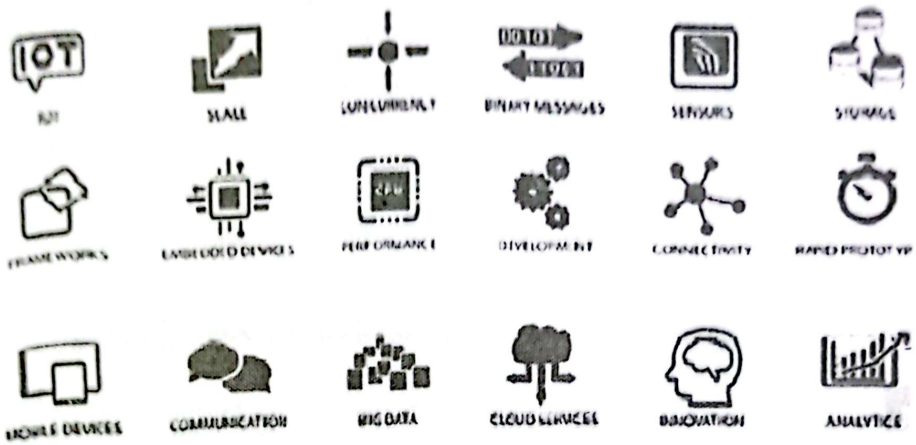
PAST PAPERS WIKI

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c) ABC Pharma has been decided an IOT application called automatic fall detection system which can be applied in elder health caring. This is a human centered design which provide timely detection and communicate fall events for immediate medical aid in case of injury. The fall detection system has been reported to provide reduction in death rates of up to 80%, due to timely medical support.

i) What are the sensing edge devices can be used to detect falling.

ii) Draw a diagram to illustrate how fall detection system is functioned.(You can use following symbols as you need.)



c) Some of the common real world IOT applications are mentioned below. Give one example for each of them.

I. Smart home -

II. Wearable device -

III. Internet connected vehicle -

d) Embedded systems are the basic concept of internet of things (IOT). They provide the intelligence that enables device to communicate each other and with the cloud.

i) What is an embedded system ?

ii) What are the primary hardware components that makeup an embedded system?

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iii) At present agent technology is widely used in many areas in the society. Name two examples of software agents which are used in mobile operating systems.
"Go with me" is a mobile app which the people can access it as the passenger or vehicle owner.

A vehicle owner can input his vehicle number, ID no, his route, time scheduled and the number of seats available.

Passenger can access the "Go with me" through his mobile phone and chat bot 1 agent starts interacting with the user. User can use text or voice as the input medium. During this interaction chat- bot passes the extracted information to a search agent who will take over from the chat bot agent and proceed to search for vehicle which match for the passenger requirements. Once the search results are obtained the search agent display list of available vehicles for the customer and get the confirmation through the chat bot agent. After confirmation of the passenger, it sends passengers details for the chat bot agent 2 of the vehicle owner and chat bot starts interacting with the vehicle owner and confirm the ride.

(i) Draw a simplified agent diagram of the above explained multi agent system. Name the important entities in your diagram.

(ii) Which agent cannot be considered as the self-autonomous?

(iii) Explain your answer in question.