

Online Test – October 2021
Grade 13

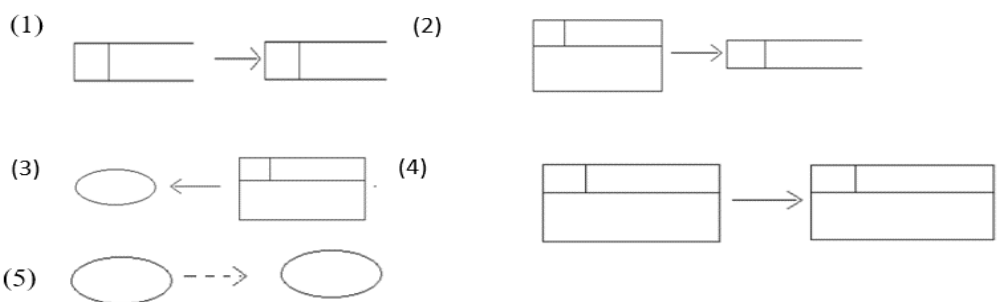
Information Communication
Technology - I

20 E I

Two hours

• **Answer all the questions**

- Which of the following is not a cloud storage method
1) Google Drive 2) Drop box 3) iCloud 4) URL 5) Microsoft One Drive
- What is the binary equivalent to decimal 68.125?
(1) 00100010.01 (2) 01000100.001 (3) 01000100.1
(4) 01111101.0 (5) 10111011.110
- Which one has the fundamental error in the following Data Flow Diagram (DFD)?



- ___ of the system gives long life to the new system.
1)Implementation 2)Maintenance 3)Testing
4)designing 5)deploying
- .What is the correct representation of the following IPV4 Address.

11000000.10101000.00001010.00001011

Select correct one

- 1)192.128.0.11 2)192.168.10.11 3)192.148.0.11
4)172.128.0.11 5)192.168.10.1

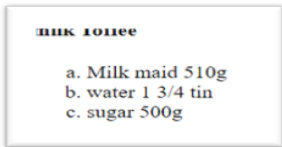
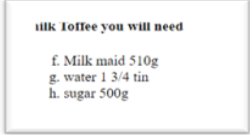
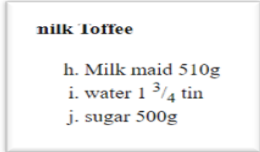
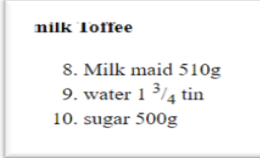
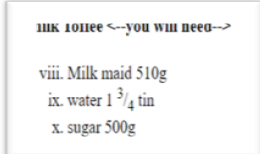
- Which of the following statement/s regarding the testing of a system are correct?
A: White -Box Testing is software testing technique in which external structure is tested
B: Black -Box Testing is software testing technique in which internal structure is tested
C: System testing should be performed prior to Unit Testing
1) A only 2) B only 3) A and B only 4) B and C only 5) None of the above

7. The octal equivalent of $E5_{16}$ is,
1) 229_8 2) 345_8 3) 354_8 4) 648_8 5) 11100101_8
8. Consider the following statements regarding an information system of a library.
A: It shall be able to check if the book is available.
B: It shall be able to maintain the record of fines
C: It shall be able to provide the facility of online forms
D: It shall be able to add new book to the database
1) A, B and D only 2) B only 3) A and B only 4) A, B and C only 5) All of the above
9. 1's complement of 1011101 is _____
1) 0101110 2) 1001101 3) 0100010 4) 1100101 5) 0000011
10. On subtracting $+28$ from $+29$ using 2's complement, we get _____
1) 11111010 2) 111111001 3) 100001 4) 1 5) 100011
11. In which expression given below, the output will be equal to the output values of $A+B$ Boolean expression?
1). $AB+BB'+AA'$ 2). $AB+AB'+A'B$ 3). $AB+AB+A'B'$
4). $AB+AB'+A'B'$ 5). None of above
12. Devices on one network can communicate with devices on another network via
A.-Router B.-Hub
C.-Gateway D-Multiplexer
Which of the above is/are correct?
1) A and B only 2) D only 3) A and C only 4) B and C only 5) A, B and C only
13. Which one is not related to nature inspired computing ?
1) Cleaner Fertilization
2) behavior by leaving a healthy bird
3) ant colonies react to stimuli
4) swarm intelligence
5) observing phenomena the patterns of spreading epidemics
14. Which one of the following is the address generated by CPU?
1) physical address 2) absolute address 3) logical address
4) MAC address 5) None of the mentioned

15. Consider following HTMLcode:

```
<html>
  <body>
    <h4>milk Toffee <!--You will need --></h4>
    <ol type="a" start=8">
      <li>Milk maid 510g</li>
      <li>water 1 <sup>3</sup></sup></sub>4</sub> tin</li>
      <li>sugar 500g</li>
    </ol>
  </body>
</html>
```

Which of the followings correct output ,when the above code is rendered?

- 1)  2) 
- 3)  4) 
- 5) 

16. 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

17. Which device cannot categorize under both input and output devices?

- 1) MICR 2) Headsets 3) Network Cards
4) Electronic white board (5)Modems

18. In Operating Systems, which of the following is/are CPU scheduling algorithms?

- 1) Round Robin 2) Shortest Job First 3) Priority
- 4) First Come First Served 5) All of the mentioned

19. Logical memory is broken into blocks of the same size called _____

- 1) frames 2) pages 3) offsets 4) backing store 5) fragments

20. In DFD a data cannot flow between a store and

(i) a store

(ii) a process

(iii) an external entity

- 1) i and iii 2) i and ii 3) ii and iii 4) i ,ii and iii 5)ii

21. Which of the following statement is true? Select correct one

- 1) MAC address is a logical address
- 2) IP address is a logical address and MAC address is a physical address
- 3) Both IP address and MAC addresses are virtual addresses
- 4) IP address is a physical address and MAC address is a logical address
- 5) IP address is a physical address

22. Not a benefit of reverse auctions ?

- 1) Reduce transaction costs (2) real time pricing 3) Time Savings
- 4) increase transparency for suppliers (5) increase negotiation phases

23. Artificial Intelligence is about_____.

- 1)Playing a game on Computer
- 2)Making a machine Intelligent
- 3)Programming on Machine with your Own Intelligence
- 4)Putting your intelligence in Machine
- 5)Get daytoday facility from a machine

24. Use following descriptions and A,B,C,D relations to answer the questions.

A principal in a school needs a database to store students 'admission of numbers, names, addresses, NIC numbers, and date of birth ,and wants to know the marks obtained by a student for each subject. In addition he wants to know the subjects assigned for teachers.

Relations

A .Student (admissionNo, studentName, address ,DOB,NIC)

B. Subject (subjectCode ,subjectName)

C. Mark(admissionNo, subjectCode, markObtained)

D. Teacher(teacherNo ,subjectCode ,teacherName ,subjectName, class)

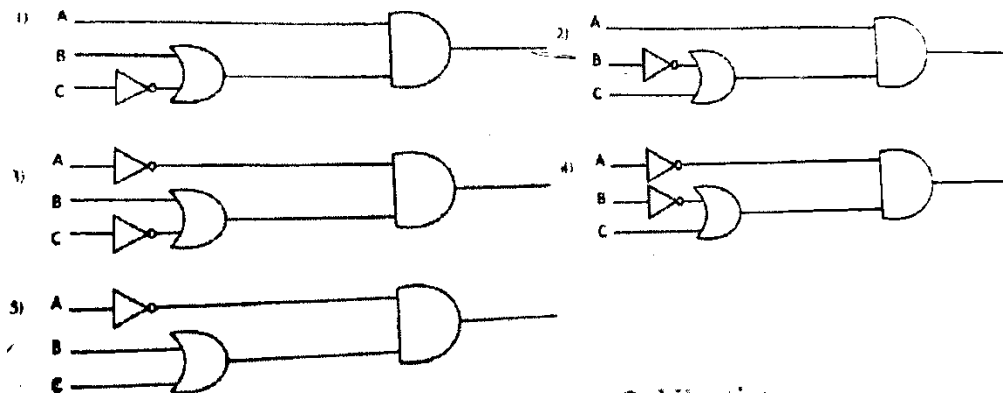
What are the relations from above set exist in third normal form

- 1).Only A and C 2).Only A and D 3).Only A,B and C
 4).Only A,C and D 5).Only B,C and D

25. Consider the Boolean expressions given below.

$$Z = AB' + (ACB + ACB')$$

In which circuit from following output will be equal to the given Boolean expression?



26. Select the answer that mentions respectively the primary key of the set for **Student**, **Subject**, and **Mark** tables

- 1) admissionNo and NIC, subjectCode, admissionNo
- 2) NIC, subjectCode, subjectCode
- 3) admissionNo, subjectCode, subjectCode
- 4) admissionNo , subjectCode, admissionNo and subjectCode
- 5) admissionNo , ,subjectName, admissionNo and subjectName

27. "Parity bits" are used for which of the following purposes?

- 1)Encryption of data
- 2)To transmit faster
- 3)To detect errors
- 4)To identify the user
- 5)for subnetting

28. .Optical fibers operate based on an optical phenomena known as

- 1)Total external reflection 2) Total reflection 3) Total refraction
- 4) Total internal reflection 5) Total external refraction

29. The transmission impairment that refers to a disturbance caused by electric or magnetic field. 1)Crosstalk 2. Thermal Noise 3. Intermodulation 4. Impulse 5. Induced Noise

30. A protocol which is not used in application layer is ?

- 1) HTTP (2) FTP (3) SMTP (4) DNS (5) UDP

31. . Which one of the following is not true?

- 1) kernel is the program that constitutes the central core of the operating system
- 2) kernel is the first part of the operating system to load into memory during booting
- 3) kernel is made of various modules which can not be loaded in running operating system
- 4) kernel remains in the memory during the entire computer session
- 5) kernel is the portion of the operating system that is always resident in memory

32. Consider the following PHP function.

```
<?php
function addNumbers(int $a, int $b) {
    return $a + $b;
}
echo addNumbers(8, "5 days");

?>
```

What would be the output?

- 1) 13 2) 8 5"days" 3)8 4) 13 "days " 5) error

33. The names of keys of A,B,C and D respectively

A :key act as a cross-reference between tables.

B:-a key with no redundant attributes

C : Out of all candidate keys, only one gets selected as primary key, remaining keys

D : A key that consists of more than one attribute to uniquely identify rows

- 1) Composite Key ,Foreign Key, , Alternate Key Candidate Key, ,
- 2) Foreign Key, , Alternate Key, Composite Key, Candidate Key
- 3)Candidate Key, Alternate Key, Foreign Key, Composite Key
- 4) Foreign Key, Candidate Key, Alternate Key, Composite Key
- 5) Composite Key ,Foreign Key, , Alternate Key, Candidate Key

34. x=[1,2.5,["ttt","pqr",True],"xx"]
print(x[2][1][1:])

- (1) ttt (2) 2.5 (3) qr (4) 1 (5) xx

35. What is the value of the following python expression?

0**0+2**-3

- (1) 1.125 (2) 0.25 (3) 0 (4) 1 (5) 2/3

36. What will be the result when the following python code is executed?

```
def recursion(a):
    if(a > 0):
        result = a + recursion(a- 1)
        print(result)
    else:
        result = 0
    return result

print()
```

- (1)

1
2
3
4

 (2)

4
3
2
1

 (3)

1
3
6
10

 (4)

10
6
3
1

 (5)

3
5
6
10

37. What would be the output when the following Python code is executed?

```
def abc(n):
    j=1
    k=1
    for i in range(1,n+1):
        print(k, end = ' ')
        j=j+1
        k=k+j
    n=6
    abc(5)
```

- (1) 1,3,6,10,15 (2) 1,2,3,4,5,6 (3) 1:1, 1:3, 1:6,1:10,1:15
(4) 1,4,9,16,25 (5) 21,15,10,6,3,1

Use following python code to answer the questions

```
i=10
while i<=15:
    print(i)
    if i== 10;
        print("Now it is 10")
    i=i+1
```

38. What is the data type of the variable "i"?

- 1).List 2).Int 3).Tuple 4).Float 5).String

39. How many times the statement 'Now it is 10' will be displayed when executing this code?

- 1) 15 2) .10 3). 1 4). 14 5).It does not display

40. What will be the following Python code?

```
dict1={"a":10,"b":2,"c":3}
str1=""
for i in dict1:
    str1=str1+str(dict1[i])+" "
    str2=str1[:-1]
print(str2[::-1])
```

- 1). 3, 2 2) 3, 2, 10 3)3, 2, 01 4)10,2,3 5) Error

41. What is the Arduino UNO?

- 1).Software 2)Hardware device 3)Network 4)Protocol 5) coding system

42. is a card with a microchip that can be used instead of cash and coins for everything from vending machine to public transportation

- 1) Debit card 2) Credit card 3)Electronic purse 4) pay pal 5)Google pay

43. Physical or logical arrangement of network is _____

- 1) Topology
2) Routing
3) Networking
4) Control
5)protocol

44. Which of the following is not an application of IoT?

- 1)Wearables 2)Smart Grid 3)Arduino 4)Smart City 5)logistics

45. The physical layer does not provide_____
- 1) mechanical specifications of electrical connectors and cables
 - 2) electrical specification of transmission line signal level
 - 3) specification for IR over optical fiber
 - 4) guarantees bandwidth and delay
 - 5)procedural interface to the transmission medium
46. Which of the following is the incorrect statement about ALOHA?
- 1). ALOHA is a multiple access protocol for transmission of data via a shared network channel.
 - 2). In Pure ALOHA, if a frame is destroyed, the station for a random amount of time.
 - 3). In Slotted ALOHA, the station can transmit a frame whenever they want.
 - 4). In Slotted ALOHA, the time of the shared channel is divided into discrete intervals called slots
 - 5). ALOHA provided the first public demonstration of a wireless packet data using UHF

47. Consider about the following HTML code

```
<!DOCTYPE html>
<html>
  <head>
    <style>
      /* This is
        a multi-line
        comment */

      p { color: black;
        }
    </style>
  </head>
  <body>
    <p>Hello World!</p>
    <p>CSS comments are not shown in the output.</p>
  </body>
</html>
```

What is the output?

- 1)Hello World!
CSS comments are not shown in the output.
- 2) Hello World!
- 3)* This is
a multi-line
Comment*
- 4) CSS comments are not shown in the output.

5) This is a multi-line comment

Hello World!

CSS comments are not shown in the output.

48. What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask?

14 2)15 3) 16 4) 30 5)32

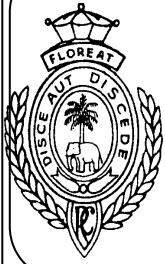
49. Which of the following statement is true about bitcoin?

- 1). There is no central server; the bitcoin network is peer-to-peer
- 2). There is no central storage; the bitcoin ledger is distributed
- 3). The ledger is public; anybody can store it on their computer
- 4) Each bit coin is basically a computer file
- 5). All of the above

50. Consider the following PHP scripts and select the correct statement .

```
<?php
    $count = 1;
    while ($count <= 12)
    {
        echo "$count times 12 is " . $count * 12 . "<br>";
        ++$count;
    }
?>
```

- (1) The loop will execute 12 times and as soon as the value of count becomes 11, the loop will exit.
- (2) The loop will execute continuously and the value of count becomes 13.
- (3) The loop will not execute, the loop will exit.
- (4) The loop will execute 12 times and as soon as the value of count becomes 13, the loop will exit.
- (5) The loop will execute 12 times and as soon as the value of count becomes 12.



3rd Term Test – Online Paper
Grade 13- October 2021

Information Communication
Technology - II

20

E

II

Three hours

Part A- Structured Essay

- **Answer all the questions this paper itself.**

01.(a)

Micro Controller		
CPU	ROM	Clock
RAM	I/O Interface	
	other peripherals	

Using appropriate HTML tags write an HTML code required to render the table in the above image (border is 1 and width is 100).

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

```
<html>
  <head><title>Create New Account</title></head>
  <body> <form method="post" action="#">
    <fieldset><legend>Enter your details</legend>
      User Name:<input type="text" name="username"><br>
      First Name:<input type="text" name="firstname">
      Last Name:<input type="text" name="Lastname"><br><br>
      Gender:<select name="gender">
        <option>Male</option><option>Female</option></select><br>
      Date of Birth:<input type="date" name="DOB"><br>
      Select Language<br>
      <input type="checkbox" name="lang" value=="English" >English</br>
      <input type="checkbox" name="lang" value=="sinhala" >Sinhala</br>
      <input type="checkbox" name="lang" value=="Tamil" >Tamil</br>
      <input type="submit" value="Create New Account">
      <input type="reset" value="Clear"><br>
      <a href="http://www.ACTA.ac.lk">More Details</a> </fieldset>
    </form> </body></html>
```

- (c) (i) Declare an indexed array(named Subjects) in PHP including three elements of "Physics", "Maths",and "ICT"

.....
.....

- (ii) .Fill in the blanks of following PHP script to display elements of array using for loop.

```
<!DOCTYPE html>
<html> <body>
<?.....
$Subjects = .....("Physics", "Maths", "ICT");
$arrlength = count(.....);

for($x = 0; $x < $arrlength; ..... ) {
echo $Subjects[.....];
echo "<br>";
}
?>
</body>
</html>
```

- (iii). What would be the output?

.....
.....

02.(a)

Match each of the given phrases (i)-(vi) relating to Agent Technology and Intelligent Techniques with the most suitable item from the list below.

List: Genetic Algorithm, Fuzzy logic system, Autonomous, Quantum computers, AI computers, Expert system, Swarm intelligence, Multi Agent System, Cooperative, Neural networks, Software Agents, Smart Agents

- (i).Loosely coupled network of software agents who interact to solve problems that cannot be solved individually.
- (ii). Computers which are based on methodology of physics, can represent information using multiple states,which exponentially faster than the traditional computers .
- (iii) Technique based on the intelligent collective behaviors observable in the entities comprising of group of creatures .
- (iv) Advice humans to solve problems with reasoning by the stored knowledge using if-then rules

(v) A technique used to control systems smoothly through unclear rules based on linguistic .. . statements.

(vi) can take decisions by themselves without the interference of the human user.

Note: Write only the matching item against the phrase number

(i).....

(ii).....




(iii).....

(iv).....

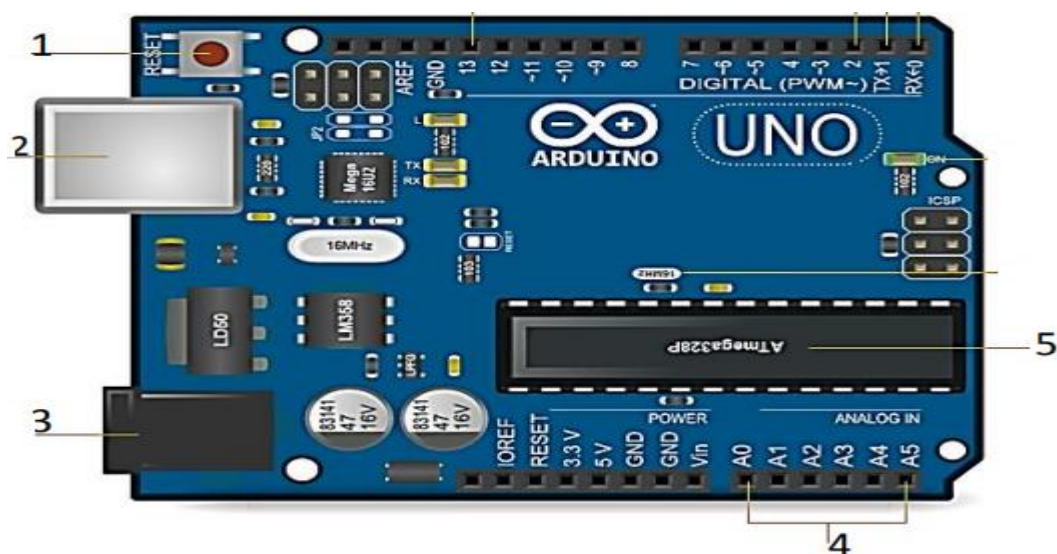
(v).....

(vi).....

(b) Name the sensors given in the figure used in Micro-Controller based system.

	Sensor	Name
i		
ii.		
iii.		

(c) Write the name of parts 1,2,3,4, and 5 of following Arduino Board given below.



- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

(d)The following program has been written for the LED bulb of the Arduino circuit to blink every half a second. Fill in the blanks.

```
// blinks an LED every ½ a second
const int ledPin = 8;

void setup()
{
    ..... (ledPin, OUTPUT);
}

void loop()
{
    digitalWrite(.....) ;
    delay (.....) ;
    digitalWrite(.....) ;
    delay (.....) ;
}
```

03.(a). What is the output of following python codes?

i

```
a=1
while a<6:
    a+=1
    if a==3:
        continue
    print (a)
```

ii.

```
fruits=[" apple","Orange","Grapes","papaw"]
for i in fruits:
    If i=="Grapes":
        break
    Print(i)
```

.....

.....

(b)

Match each of the given sentences (i)-(v) relating to computer networks with the most suitable item from the list below.

List: Latency ,NAT ,parity check, UDP, Asymmetric, ADSL, Symmetric, TCP, Tampering attack

(i).....is the time spent for transmission of data between its original source and destination .

(ii)A simple mechanism of identifying simple errors which a bit acts as a search on a set of binary values is called

(iii).....is a modification or distortion of data being transmitted through a network by an outside party.

(iv).....encryption uses separate keys of private key and public key to encrypt and decrypt data.

(v)..... processes IP address that is assigned to be identified in a computer in a LAN(private IP range) to be converted to identify within an external network(internet)

(vi)..... is connection-oriented protocol comparatively slower ,how ever retransmission of lost data packet is possible.

4 (a). Calculate the number of bits required in the address for memory having size of 16GB.

Assume the memory is 4-byte addressable.

.....
.....

(b)Computer has an 18-bit virtual memory address space where six bits are used for a page address. Calculate the total number of pages defined by the above addressing scheme.

.....
.....

(c)Consider the following virtual memory address;

010111000000111100

What is the page and displacement(offset)of this address?

.....

(d) Operating system assigns CPU to process First Come first Serve (FCFS) scheduling algorithm. Complete the columns of Completion Time and Turn around Time of the following table.

Process	Arrival Time	Burst Time	Completion Time	Turn around Time
P ₁	2	2		
P ₂	0	1		
P ₃	2	3		
P ₄	3	5		
P ₅	4	4		

(b) Complete Gantt chart for above processing schedule .

Process Name	P						
Process Time	-	-	-	-	-	-	-

Part B- Essay

- Answer any four questions only

05.

A well equipped popular gymnasium is handled by state Sports Ministry. People use it to do their physical exercises every day. It has an automatic door controls the entering of players by a system. The automatic door opening and closing denotes **on** and **off** states(D). When a player arrives the .. system determine the below factors to allow player to enter.

The system detects the availability of Gym equipment (G) indicating **on** for availability and **off** for nonavailability. The system identifies entrance time as peak time (P) and off-peak time (specially . morning and evening) by **on** for peak time and **off** for off peak time. It uses fingerprint (F)to detect the system registered or nonregistered player. Registered player(member) are allowed to enter .. during peak hours if there are vacant equipment ,and all nonregistered players are only allowed to enter during off peak hours.

- (a). Construct the truth table to represent the functionality of the above system.
- b. Derive the Boolean expression to represent the above truth table and simplify using Karnaugh map.
- c. Construct the logic circuit for the above simplified Boolean expression

06. Consider the following IP addresses which are assigned to four computers A,B,C,D

A -170.23.37.3/21

B-170.23.41.5/21

C-170.23.32.7/21

D-170.23.43.9/21

- (a.)Write down the subnet mask for the above network.
- (b) Draw suitable network diagram to show how these computers are connected to each other and name all the devices used and the IP address they use.
- (c.) State the correct OSI network reference model layer which layer each of the following devices/protocol functions belongs to
 - 1.Layer 3 switch -
 - 2.Router-
 - 3.Manchester encoding-
 - 4.Encoding-
 - 5.TCP-
 - 6.Data compression -

07.(a) What are the e-commerce type applicable for following occasions?

- (i) The Office of the Provincial Commissioner of Motor Traffic (Western Province) in Sri Lanka offers the online facility of obtaining revenue licenses for motor vehicles to the citizens.
- (ii). Reverse auctions where the consumers name the price for a product or a service
- (iii) Employees can log into the portal of the organization using their usernames and passwords and consume the services offered to them through the portal.
- (iv.)The popular online auction site eBay.com is a renowned online consumers where one sells a product or a service to the other on a dedicated virtual platform.

b.)Briefly define the following terms related to e-businesses

- i. Virtual Communities
- ii . Supply chain management
- iii. Content provider
- iv Mobile Marketing
- v. Cryptocurrency

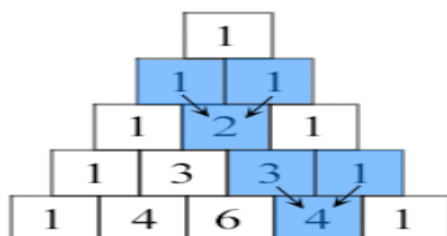
c). ICT has also contributed largely to creating more secure and alternative payment mechanisms for business transactions. Especially in electronic commerce, several alternative payment mechanisms are preferred over traditional cash-based payment methods.

i)Name two methods of online payment.

ii)write advantages and disadvantages of Cash On Delivery(COD) payment method

08. Pascal's triangle is an arithmetic and geometric figure first imagined by Blaise Pascal.

Sample Pascal's triangle



(a) Draw a flow chart to get Pascal triangle

(b)Write a Python function that prints out the first n rows of Pascal's triangle.

(c)Write the output of the function when row n is 6.

09. (a)

Following is a scenario about Football Tournament among teams of western province. Draw the ER diagram for the database of the tournament.

Many teams participate for the Football Tournament which is organized every year. Each team has a name (uniquely identified), district and a coach. A team has 14 competitors and competitor can only be in one team. A competitor is identified by the attribute of C_ID. A competitor has a name, a position (such as Goal keeper, Centre Forward etc.), and skill level. A team captain also a player. Two teams play against each other. The database keeps the record of date and score for each game.

(b) Write SQL statements to create following tables.

(i)

EMPLOYEE

EMP_NO	EMP_NAME	DESIGNATION	SEC_NO
111	S.M GUNATHILAKE	ACCOUNTANT	S11
112	R.A.AMJAD	DESIGNER	S11
113	T.SONALI	CLERK	S12

Primary key of the EMPLOYEE table is EMP_No.

(ii)

SECTION

SEC_NO	SNAME
S11	HRM
S12	FINANCE

Primary key of the SECTION table is SEC_NO.

(iii) Write SQL statement to insert values EMP_NO-114, EMP_NAME- R.NIZAL, DESIGNATION-LEGAL ADVISOR, SEC_NO-S11 into EMPLOYEE table.

10.. Draw a level 1 DFD for the following scenario. State any assumptions you make.

A Metro Campus registration system has a registrar who provides an application form and course details to a student, who then fills it and sends it back to the registrar with the relevant course fee slip. Then send this to the administrator who uses this to update student details. And admin uses student details to assign a suitable workshop to students and updates the workshop details file. Admin again retrieves the workshop details to send it to the registrar and then registrar passes the respective workshop details along with payment slip. Lecturer of academic staff of campus accesses workshop details file to retrieve workshop details.

