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Provincial Department of Education – NWP

20 | E | I

Second Term Test - Grade 13 - 2020

Index No : .... Information and Communication Technology I   Two - Hours

Instructions :
- **Answer all the Questions**
- **Write down your index number in the space provided in the answer sheet.**
- **Select the correct or most appropriate answer from the given answers of 1,2,3,4 or 5**

1. Not a step of the process of booting up a computer
   (1) Switch on the electrical switch
   (2) Send a signal to the operating system by informing accuracy of the voltage
   (3) BIOS read the instructions of CMOS
   (4) Load the operating system to the RAM
   (5) Assign the control of the computer to the operating system

2. Which answer shows the two's complements of 13_{10} and -11_{10} in 8 bits respectively?
   (1) 11110010_2 and 11110100_2 (2) 11110011_2 and 11110101_2
   (3) 00001101_2 and 11110100_2 (4) 11110011_2 and 11110100_2
   (5) 00001101_2 and 11110101_2

3. What is the correct method of transmission of a Digital Signal from the picture?
   (1) Frequency Shift Keying
   (2) Amplitude Shift Keying
   (3) Phase Modulation
   (4) Frequency Modulation
   (5) Phase Shift Keying

4. Consider the following statements about data transmission media.
   A. Radio waves and infrared are used in building wireless computer networks.
   B. Magnetic waves do not interfere with the transmission of data using optical fiber optics.
   C. Microwaves are used for satellite transmissions.
      Which of the above statement/statements 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* Only.

5. ……………………..is deciding the prices of goods and services by bidding competitively with sellers in the process of selling and buying goods and services.
   (1) Group purchasing   (2) e-Marketplace   (3) Ordinary auction
   (4) Digital economy   (5) Reverse auction

6. Consider the following statements regarding the systems
   A. Open systems get inputs from the environment and give the output to the environment
   B. Though a microprocessor is available in modern digital devices no memory devices
   C. Knowledge management systems are utilized to analyze business data to make decisions
   Which of the above statement/statements is/are correct?
   (1) *A* Only.   (2) *B* Only.   (3) *C* Only.   (4) *A* and *B* Only.   (5) *A* and *C* Only.

7. In system testing stage, the method of testing the software as a whole by an independent person or a team is,
   (1) Unit testing   (2) Integrated testing   (3) System testing
   (4) Acceptance testing   (5) White box testing

8. Fetching an instruction from the main memory, decode it and store the result again in the main memory after executing it is named as,
   (1) Von Neumann architecture   (2) Fetch – Execute cycle
   (3) Abstract model of creating information   (4) Data life cycle
   (5) Management of big data

9. Which of the following HTML tag, that has been not in used since the introduction of the HTML version 5?
   (1) < List >   (2) < Img   (3) < Form >   (4) < Frameset >   (5) < A >

10. The correct HTML segment which can be used to limit the number of characters to 15 in the text box Nick Name in the Form of given picture.
    (1) <input type="text" name="nickname" maximumlength="15">
   (2) <input type="text" name=" nickname " maxlength="15">
    (3) <input type="text" name=" nickname " length="15">
    (4) <input type="text" name=" nickname " width="15">
    (5) <input type="text" name=" nickname " maxcharacter="15">

    Member Information

    First name: [_____]

    Last name: [_____]

    Nick Name [_____]

    Gender: ● Male ○ Female
    Date of Birth : [mm/dd/yyyy]

    [Submit] [Cancel]

11. Consider the following statements about the method of contiguous allocation in file management of operating systems
    A. Contiguously allocated files can be used efficiently afterwards
    B. It is efficient to find the space compatible with the size of the file in hard disk to save the file
    C. External fragmentation can occur due to contiguous allocation
    Which of the above statement/statements is/are correct?
    (1) *A* Only.   (2) *C* Only.   (3) *A* and *B* Only.
    (4) *A* and *C* Only.   (5) *A*, *B* and *C* Only.

12. Consider the following statements about Internet of Things (IoT)
    A. The devices which use IoT must be connected to a network to contact with each other though they are not always connected to the internet .
    B. Internet of Things (IoT) is an embedded system connected over the Internet
    C. Sensors must be used as input devices in IoT.
    Which of the above statement/statements is/are correct?
    (1) *A* Only.   (2) *B* Only.   (3) *A* and *B* Only.
    (4) *B* and *C* Only.   (5) *A*, *B* and *C* Only.

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13. The incorrect statement regarding the requirements of information systems is,
    (1) Functional requirements are the services provide to enhance the efficiency of the system
    (2) The word "shall be" is used to write the functional requirements
    (3) In system analysis stage, functional requirements and non-functional requirements can be identified separately
    (4) Functional requirements are the requirements included in software
    (5) Non-functional requirements clearly show the limitations of the systems

14. What is an advantage of the virtual memory?
    (1) The ability of keeping opened the programs larger than the capacity of the main memory
    (2) The Operating system has the ability to do other task while doing one task
    (3) The ability of using one central processing unit for many tasks
    (4) The ability of increasing the capacity of secondary storage
    (5) The prevention of fragmentation of hard disk in saving date files

- **To answer questions 15 to 18, please refer to the ER diagram below.**
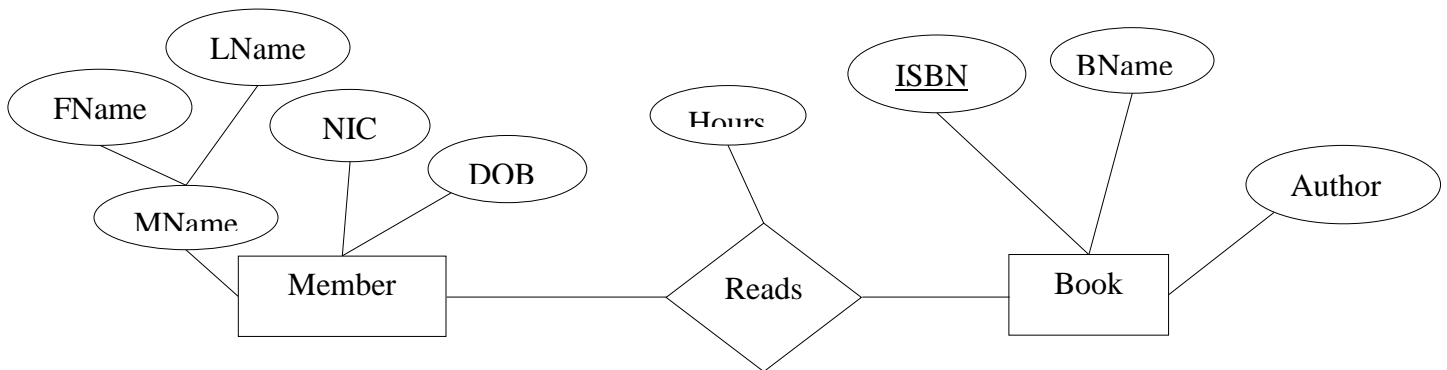
15. What is the correct relational schematic diagram with respect to the ER diagram
    (1) Member(NIC, DOB, MName)　　　　　　(2) Member(NIC, DOB, FName, LName)
        Book(ISBN, BName, Author)　　　　　　　　Book(ISBN, BName, Author, Hours)
        Reads(NIC, ISBN, Hours)　　　　　　　　　Reads(NIC, ISBN)

    (3) Member(NIC, DOB, FName, LName, Hours)　(4) Member(NIC, DOB, , FName, LName)
        Book(ISBN, BName, Author)　　　　　　　　Book(ISBN, BName, Author)
        Reads(NIC, ISBN)　　　　　　　　　　　　Reads(NIC, ISBN, Hours)

    (5) Member(NIC, DOB, MName, Hours)
        Book(ISBN, BName, Author)
        Reads(NIC, ISBN)

16. Consider the following statements about the ER diagram above:
    A. "MName" is a derivative attribute.
    B. The cardinality of entities is many to many.
    C. "Hours" is the primary key to a relationship
    Which statement / statement is true?
    (1) *A* Only.　　　　　　(2) *B* Only.　　　　(3) *A* and *B* Only.
    (4) *B* and *C* Only.　　　(5) *A*, *B* and *C* Only.

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17. Suppose relationship the above, relational database tables. Forgot to specify the primary key when creating a table named Book. What is the appropriate SQL statement to include the primary key for that table?
   (1) ALTER TABLE Book SET ISBN (PRIMARY KEY);
   (2) ALTER TABLE Book ADD ISBN AS PRIMARY KEY;
   (3) ALTER TABLE Book INSERT PRIMARY KEY (ISBN);
   (4) ALTER TABLE Book SET PRIMARY KEY (ISBN);
   (5) ALTER TABLE Book ADD PRIMARY KEY (ISBN);

18. What is the SQL statement to delete all attributes in the BOOK table as author's data Edward?
   (1) DELETE WHERE Book.Author= 'Edward';
   (2) DELETE 'Edward' FROM Book;
   (3) DELETE *FROM Book WHERE Author= 'Edward';
   (4) DELETE FROM Book WHERE Author = 'Edward';
   (5) DELETE *FROM Author WHERE Book = 'Edward';

19. Which of the following statement is correct about multi – core processors?
   (1) There are two or more independent processing units (cores) in a computer.
   (2) A processor that executes parts of various programs at the same time.
   (3) Multiple instructions run in a single processor
   (4) Only a single instruction can be run in a multi-core processor
   (5) The performance of a computer gets low by using a multi-core processor

20. $5AE_{16} + 357_8 =$
   (1) $69E_{16}$ (2) $69D_{16}$ (3) $6AE_{16}$ (4) $9AE_{16}$ (5) $96D_{16}$

21. Which of the following is the correct according to the bitwise logic operation,
   $1101011_2 \quad XOR \quad 1001101_2$
   (1) 0100110_2 (2) 1011001_2 (3) 1111001_2 (4) 0101110_2 (5) 0110110_2

22. Consider the following statements regarding the Open System Interconnection model.
   A. Transmitting data over a transmission medium is done in the transport layer.
   B. The network layer identifies the IP addresses of the devices connected to the transmission.
   C. Data transformation and coding takes place in the presentation layer.
   Which of the above statement/statements 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

23. Which of the following HTML code lines is correct for creating hyperlink using the URL of "https://www.w3schools.com/html/default.php", for given image?
   (The name of the image is "w3schools.jpg" and the image is stored in the folder where the web page is stored.)
   (1) $< A\ src = "https://www.w3schools.com/html/default.php" > < Img\ src = "w3schools.jpg" >< /A >$
   (2) $< A\ src = "https://www.w3schools.com/html/default.php" > < Img\ iref = "w3schools.jpg" > </A >$
   (3) $< A\ href = "https://www.w3schools.com/html/default.php" > < Img\ src = "w3schools.jpg" > </A >$
   (4) $< A\ href = https://www.w3schools.com/html/default.php > < Img\ = "w3schools.jpg" ></A >$
   (5) $< A\ href = "https://www.w3schools.com/html/default.php" > < Img\ src = "w3schools.jpg" > </Img ></A >$

24. Consider the statement about database Normalization and various dependencies
    A. The second Normalization involves removing partial dependency of a table.
    B. Normalization eliminates database inconsistencies.
    C. The second Normalization involves removing the transitive dependency of a table.
    Which statement / statement is true?
    (1) A Only.　　　　　　(2) A and B Only.　　　　　　(3) A and C Only.
    (4) B and C Only.　　　(5) A, B and C Only.

- Please refer to the description below to answer questions 25 to 26
  The Internet address 153.215.105 / 21 was purchased to provide internet connectivity to computers in a university computer network.

25. What is the total number of host bits can be assigned to the computer network using the above Internet address?
    (1) 11　　　　(2) 21　　　　(3) 105　　　　(4) 9　　　　(5) 8

26. What is the total number of IP addresses received for the above IP address?
    (1) 256　　　(2) 21　　　(3) 11　　　(4) 2048　　　(5) 1024

27. Which of the following statements is correct about the user data gram protocol (UDP) and transmission control protocol (TCP) used in computer networking?
    A. These protocols are two protocols running in the data link layer.
    B. TCP and UDP are two transport layer protocols.
    C. TCP uses UDP as the transport protocol.
    (1) A Only.　　　　　　(2) B Only.　　　　　　(3)A and C Only.
    (4) B and C Only.　　　(5) A, B and C Only.

28. Which of the following is an example of a PHP variable?
    (1) $user\_name$　　　　(2) $\#user\_name$　　　　(3) $\&user\_name$
    (4) $/* user\_name$　　　(5) $\$user\_name$

29. Which of the following statement about the coding systems, that are used to represent data in the computer is correct?
    (1) The first coding system used in IBM computers is UNICODE.
    (2) Only 7bits are used to store a character and the other bit is used as a check digit in ASCII coding system.
    (3) BCD and EBCDIC coding systems are used only to represent decimal values.
    (4) EBCDIC is a coding system which is compatible with modern encodings.
    (5) ASCII coding system is used to represent most languages in the world

30. Which HTML segment is used to create the following table?

Sales Report		
Product	**Sales**	
	Jan	Feb
Keyboard	200	150
Mouse	230	135

(1)
```
<table border ="1">
 <tc> Sales Report </tc>
 <tr>
  <th rowspan="2">Product</th><th colspan ="2">Sales</th>
  </tr>
 <tr><td>Jan</td><td>Feb</td>  </tr>
 <tr><td>Keyboard</td><td>200</td><td>150</td></tr>
 <tr><td>Mouse</td><td>230</td><td>135</td></tr>
</table>
```

(2)
```
<table>
 <tr> Sales Report </tr>
 <tr>
  <th rowspan="2">Product</th><th colspan ="2">Sales</th>
  </tr>
 <tr><td>Jan</td><td>Feb</td>  </tr>
 <tr><td>Keyboard</td><td>200</td><td>150</td></tr>
 <tr><td>Mouse</td><td>230</td><td>135</td></tr>
</table>
```

(3)
```
<table border ="1">
 <tr>Sales Report</tr>
 <tr>
  <th rowspan="2">Product</th><th colspan ="2">Sales</th>
  </tr>
 <tr><td>Jan</td><td>Feb</td>  </tr>
 <tr><td>Keyboard</td><td>200</td><td>150</td></tr>
 <tr><td>Mouse</td><td>230</td><td>135</td></tr>
</table>
```

(4)
```
<table >
 <tc>Sales Report</tc>
 <tr>
  <th >Product</th><th colspan ="2">Sales</th>
  </tr>
 <tr><td>Jan</td><td>Feb</td>  </tr>
 <tr><td>Keyboard</td><td>200</td><td>150</td></tr>
 <tr><td>Mouse</td><td>230</td><td>135</td></tr>
</table>
```

(5)
```
<table border ="1">
 <tc>Sales Report</tc>
 <tr>
  <th colspan="2">Product</th><th rowspan ="2">Sales</th>
  </tr>
 <tr><td>Jan</td><td>Feb</td>  </tr>
 <tr><td>Keyboard</td><td>200</td><td>150</td></tr>
 <tr><td>Mouse</td><td>230</td><td>135</td></tr>
</table>
```

31. Consider the following statement about cascade styling sheets (CSS).
    A. "." is used to define a class in class selector.
    B. CSS comments are staring by " $*/$" and ending by "$/*$"
    C. $<$ h1 style $=$ "color: blue; margin $-$ left: 30px; " $>$ G. C. E. Advance Level $</$h1 $>$ is an example for Inline style.
    Which of the above statement/statements 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

32. Consider the following statements about data which are used to create information.
    A. Creation of information can be identified as processing of data.
    B. Have to face challenges such as supervision, analysis and update when processing big data.
    C. Data are processed into information in the step of data creation of the data life cycle.
    D. QR code checking is an example for data gathering methods.
    Which of the above statements are correct?
    (1) A and C Only.   (2) A and D Only.   (3) A, B and C Only.
    (2) A, B and D Only.   (5) All A, B, C and D

33. ……………………… is the process of obtaining sensitive data such as usernames, passwords, credit card data, etc., as a trusted party.
    Which of the following is best to fill in the blank of the above sentence?
    (1) Hijacker   (2) Spam   (3) Spyware   (4) Phishing   (5) Bots

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34. Select the correct statement/statements regarding system deployment
    A. In parallel deployment, risk is less but cost is high
    B. In direct deployment, risk is less due to no need of time to understand the new system by the end user
    C. In phase deployment, the new system is implemented only for a selected part firstly
    Which of the above statement/statements 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 Only

35. In computer networking, data transmitted from the source to the receiver, What Are the correct Reasons for Error?
    A. Presence of synchronization problems.   B. Distortion   C. The shape of the signal changes.
    (1) A Only
    (2) B Only
    (3) C Only
    (4) A and B Only
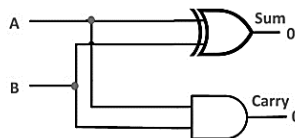   (5) All A, B and C

36. Consider the following Karnaugh Map

C \ AB	00	01	11	10
0	0	0	1	1
1	1	1	0	0

Which of the following is the correct logic statement corresponding to the two categories set out on the Karnaugh map?
(1) $(\bar{A} + \bar{C}).(A + B)$
(2) $\bar{A}\bar{C} + AC$
(3) $A\bar{C} + AC$
(4) $(A + C).(\bar{A} + \bar{C})$
(5) $(A + \bar{C}).(\bar{A} + C)$

37. Consider the following logic gates circuit and truth table.

A	B	SUM	CARRY
0	0	0	Ⓡ
0	1	Ⓟ	0
1	0	1	0
1	1	Ⓠ	Ⓢ

What is the correct answer for Ⓟ, Ⓠ, Ⓡ, and Ⓢ?
(1) 1,1,1,0
(2) 1,0,1,1
(3) 1,1,1,0
(4) 1,1,1,1
(5) 1,0,0,1

38. Consider the following truth table.

A	B	NOT A	(NOT A)XOR B	A NAND B	((NOT A)XOR B) NOR (A NAND B)
0	0	1	1	1	W
0	1	1	0	1	X
1	0	0	0	1	Y
1	1	0	1	0	Z

Which of the followings correctly specifies the truth values of W, X, Y and Z in that order?
(1) 1,1,0,0
(2) 0,0,0,0
(3) 1,0,1,0
(4) 1,1,1,1
(5) 0,1,1,1

39. Consider the following statements about servers used in computer networking.
    A. Proxy server is used to limit web access in client computers.
    B. DNS server dynamically allocates IP addresses to network devices.
    C. DHCP server converts web addresses to IP addresses.
    D. Published web sites are stored in web server.
    Which of the above statement/statements is/are correct?
    (1) A and B Only
    (2) A and C Only
    (3) A and D Only
    (4) A, B and D Only
    (5) A, B and C Only

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- **Please refer to the flow chart below to answer questions 40 to 42**
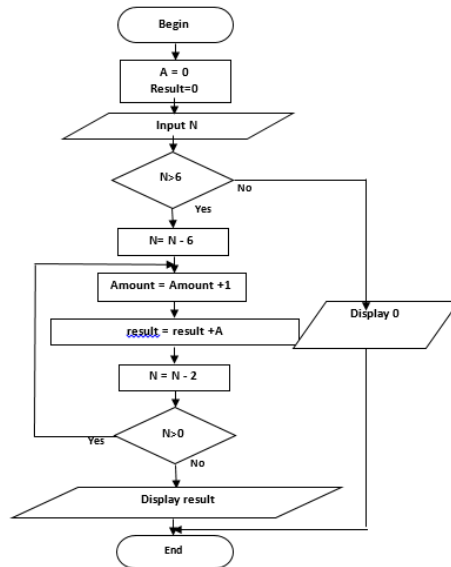
40. Which of the following statements is true regarding the algorithm presented in the flowchart?
    A. This is an input unit and has 6 outputs.
    B. This takes outputs only for numbers greater than 6 that are input to N.
    C. When the input value for N is 6, the output is 0.
    (1) A Only   (2) C Only   (3) A and B Only
    (4) A and C Only   (5) B and C Only

41. What is the output when 10 is given to the algorithm as input?3
    (1) 3   (2) 5   (3) 4   (4) 2   (5) 0

42. Which of the following Python programs is similar to the flowchart above?

A.
```
A=0
N=int(input( ))
result=0
while N>0:
    N=N-6
    if N>0:
        A=A+1
        result = result + A
    N=N-2
    print(result)
else:
    print(0)
```

B.
```
A=0
N=int(input( ))
result=0
if N>0:
    N=N-6
    while N>0:
        A=A+1
        result = result + A
    N=N-2
    print(result)
else:
    print(0)
```

C.
```
A=0
N=int(input( ))
result=0
if N>0:
    N=N-6
    for N in range(N ,0,-2):
        A=A+1
        result = result + A
    print(result)
else:
    print(0)
```

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

42. What is the output when you run the following Python program?

```
num = 5
while num > 0:
    num =num -2
    if num == 3:
        continue
    print(num)
```

(1)	(2)	(3)	(4)	(5)
4	5	5	3	1
3	3	3	1	-1
2	2	1	-1	
1	0	-1		

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43. What is the correct value of the following Python statement?
(12 >> 2) % 4 & 7
(1) 7   (2) 6   (3) 3   (4) 2   (5) 0

44. What is the output when you execute the following Python code?

```
x=[34,7,12,17,21,4,51]
t=0
for i in range(0,len(x)):
    b=x[i]%2
    if b==0:
        t=t+x[i]
print(t)
```

(1) 96
(2) 146
(3) invalid Syntax
(4) 50
(5) list index out of range

45. What is the output when you execute the following Python code?

```
a=10
def number( ):
    y=[ ]
    for x in range(a,0,-2):
        y=y+[x]
    return(y)
a=number( )
print(a)
```

(1) invalid Syntax
(2) [10, 8, 6, 4, 2]
(3) 10
(4) 0
(5) [2,4,6,8,10]

46. $a = b = c = 2,5.5,'python'$
Which statement is correct related the above Python statement?
(1) All three variables a, b, c have the same data type.
(2) This is a syntax error statement.
(3) The three variable names a, b, c, are integer, float, and string data types.
(4) All three variable names a, b, c, are tuple.
(5) All three variable names a, b, c, have the same value.

47. Which of the following statement is true about programming languages?
(1) Assembler is a translator that translates into Assembly language.
(2) High-level programming languages can be run directly on any computer.
(3) Assembly language belong to the first generation of computer languages.
(4) Machine languages run slower compared to other languages.
(5) Python does not belong in high-level programming languages.

48. The process of directing the data relevant to a task to the memory and directing them to the relevant devices with the compatible speed of the device is known as,
(1) Compaction   (2) Paging   (3) Spooling   (4) Defragmentation   (5)Memory allocation

50. What is the appropriate SQL statement for selecting all the data in the record with data starting with the letter "C" in the "$FirstName$" field in the student table?
(1) SELECT * FROM Student WHERE FirstName LIKE '%c'
(2) SELECT * FROM Student WHERE FirstName = 'c'
(3) SELECT * FROM Student WHERE FirstName = '%c%'
(4) SELECT * FROM Student WHERE FirstName LIKE '%c%'
(5) SELECT * FROM Student WHERE FirstName LIKE 'c%'

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20 | E | II

Second Term Test - Grade 13 - 2020

Index No : .... Information and Communication Technology II   Three Hours

Answer all questions in Part A and only four questions selected from part B

Part –A

- **Answer all the four questions on this paper itself.**
- **Write your answers in the space provided for each question.**

1. (*a*) Mention two benefits introduction of the HTML5 version

   ……

   ……

   ……

   ……

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

   ```
   <h2>User Login</h2>
   <form>
        User Name:<br>
        <input type="text" name="username">
        <br>
        Password:<br>
        <input type="password" name="password">
        <br><br>
        <input type="submit" value="Login">
        <input type="reset" value="Cancel">
   </form>
   ```

(ii) Write the HTML code for render following output.

Web Developing Software

Web authoring tools	- Open Source Software - Kompozer - Ckeditor - Commercial Software - Adobe dream weaver - Microsoft front page

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(*c*) Write down the internal style required to apply the styles mention in the following table.

Element Name	Attribute	Attribute Value
Body	background-color	Pink
P	color font-family font-size	Red courier 150%

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....

(d) Below is a section of incomplete PHP code written to display a greeting message according to the time a user visits the site. The greeting message is generated by the server's system time that web site is stored. If the user visits the web site less than 10 hours, the message will be "Have a good morning!", if less than 20 hours the message will be "Have a good day " and else the message will be Have a good night!"

Fill in the blank and complete the PHP code.

```php
<?php
………………… = date("H");
echo "<p>The hour is " . $time;
echo ", and We wish you:</p>";
if ($time < "10") {
    echo "Have a good morning!";
} elseif (………….................){
    echo "…………………………………………………………..";
} else {
    echo "…………………………………………………………..";
}
?>
```

2. (a) Match each of the given phrases $i - vi$ relating to e-commerce with the most suitable term from the list below.

List = { Mobile marketing, reverse auction, online service provider, web portals, brick and click, pure click, business to consumer service (B2C), group purchasing

Phrases:

I.   Is a specially designed website that brings information from diverse sources with related web sites.
II.   Here, the seller bid for the prices of goods and services at which he is willing to sell.
III.   Describe a transaction between a business or online retailers and their consumers.
IV.   Any advertising activity that promotes products and services through emails, SMS, MMS and social networks using mobile devices, such as tablets and smartphones targeting a specific group of consumers.
V.   Provide online services such as web forums for customers with direct contact with the Internet.
VI.   Order a product over the internet and obtain the product from a local store.

Note : Write only the matching term against the phrase number.

I.   ……………………………………………………………...……………………………………………….
     …………………………………………………………...…………………………………………………….

II. ……………………………………………………………...……………………………………………….
     …………………………………………………………...…………………………………………………….

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III. …………………………………………………………..………………………………………………
……………………………………………………………………....…………………………………….

IV. …………………………………………………………..………………………………………………
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V. …………………………………………………………..………………………………………………
……………………………………………………………………....…………………………………….

VI. …………………………………………………………..………………………………………………
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(*b*) Consider the Python program below

```
f=open('python.txt','a')
number=int(input("input integer number"))
z=number
b=""
while z>0:
        z=z//2
    b=str(y)+b
f.write(2str(number)+" -: "+b+'\n')
y=z%
f.close()
```

    (*i*) What is the purpose of the following code sections in this program?

        i.   f=open('python.txt','a')

        ……

        ii.   z=z//2

        ……

        iii.   y=z%2

        ……

    (ii) Write the output if 65 were input to this program.

        ……………...........………………………………………………………………………………………

3. (a) The following is a database of selected officials for a Tamil language training course for public servants. There is a unique number for each of the branches.

MemberID	FirstName	LastName	Department	Branch	BranchID
102	Nimal	Perera	Education	Kurunegala	edu-014
265	Gayani	Kaveesha	Agriculture	Anuradhapura	agr-015
070	Poornima	Sewwandi	Motor Traffic	Narahenpita	mt-001

    I.   What is the normalization level of this table?

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    II.   Explain the reason for your answer by using the table above.

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    III.   Write the relationship for the next Normalization level.

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(b) Draw how the non return to zero inverted(NRZ-I) coding method is transmitted to the signal given below. (Marked for the first bit)
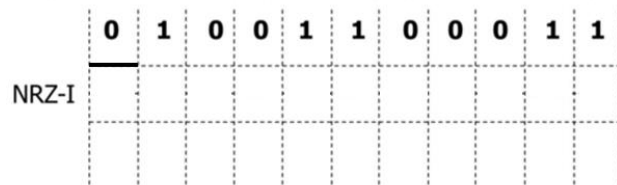
    I. The Distortion and Attenuation of the wave propagation hinders accurate data transmission. Describe distortion and Attenuation

Distortion

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Attenuation

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4. (*a*) Some functions of a computer operating system are given in the column A of the following table.
Filling the blanks of the column B using the words or phrases in the list given below

Column A	Column B
I. Contain the information about the places where the data is stored in a data file saved in scattered sectors in the hard disk	
I. Changing the state of a process from one state to another state	
I. Connect a frame of a physical memory to an address of a page in virtual memory	
V. Carry a process or a part of a process from Main memory to virtual memory	
V. Decide whether which process is sent to the processor among the processes	

{mapping, paging, index table, page table, context switching, short term scheduler, long term scheduler, swapping}

(*b*) Interruptions occur in process management which done by the operating system of a computer.

I. Explain the term "interrupt " in brevity

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ii. State the main two types of interrupts

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iii. Briefly describe the way of occurring each interrupt mentioned in part ii

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Important:
* **Answer only four questions from part** B.

1. In an ice-cream factory all the ice-cream are proceeding to flavor just after basic manufacturing. Hereby it is specially considered about **the flavor (A), color (b) and quantity of milk fat (C).** It is necessary to contain the standard flavor, standard color and standard quantity of milk fat for special ice-cream production.
    Even so **chocolate flavored ice-cream can be produced in the following conditions.**
    *   It is necessary to contain the right quantity of milk fat composition in order to flavor the ice-cream.
    *   The ice-cream mixture should have standard color and standard flavor when the above mentioned condition is fulfilled.
    *   If the ice-cream mixture with a standard quantity of milk fat composition does consist of the standard color even without the standard flavor, it can be flavored with chocolate.
    *   If the ice-cream mixture with a standard quantity of milk fat composition does consist of the standard flavor even without the standard color, it can be flavored with chocolate.
    *   Ice-cream covers are produced out of the mixture without the above mentioned quality.
    If the standard flavor is represented by Boolean value 1, color is represented by Boolean value 1 and standard quantity of milk fat composition is represented by Boolean value 1.
    (i)   Construct a truth table to represent the above chocolate flavored ice-cream manufacturing process.
    (ii)   Write a Sum of product (SOP) Boolean expression (not simplified) for the final output to represent the truth table.
    (iii) Simplify the Boolean expression obtained in section (ii) above using the Karnaugh map.
    (iv)   Construct a logic circuit for simplified Boolean expression in section (iii) above using NAND gates only.

2. The four faculties of Engineering, Management, Law and Science at Hogwarts University are located in separate buildings. Each faculty has a computer lab with 50, 30, 40 and 56 computers respectively. Each faculty is provided with a printer and a scanner. The Faculty of Engineering has made an Internet connection in the IP Address, 192.178.15.0/24, providing internet to every faculty.

    (i)   Four separate subnets have been created for each faculty and assigned IP addresses to computers. Write down the network address, host address range, broadcast address and subnet mask provided to the computers in the following format (Note: Assume that the IP addresses are assigned to the Faculty of Engineering, Management, Law and Science respectively).

Faculty	Network Address	Host address		Subnet mask
		Since	To	
Engineering				
Management				
Law				
Science				

    (ii)   The Computer Laboratory belonging to the Faculty of Science was divided into two parts and one part was given to the newly started Faculty of Technology. There are 30 computers for the new Faculty of Science and 26 for the Faculty of Technology. Enter the subnet mask, IP address range and broadcast address of the two new computer labs in the format below.

Faculty	Network Address	Host address		Subnet mask
		Since	To	
Science				
Technology				

(iii) Explain the reasons which faculty computer Laboratory should be provided with the printer and scanner on this network.

(iv) The Computer Laboratory of the Faculty of Engineering maintains a proxy server, an application server and a mail server accessible to all faculty to control the internet access to the university. A firewall is also installed for system security. Draw a network diagram to illustrate the logic layout of the university's computer network. Highlighted the network connection topology and the devices.

3. (a) "Dilena Salu" is a business place to sell various types of women's and children's wear. All transactions are currently conducted by the customers in the place of business.
   (i) Owners of this business intend to create a web site that enables customers to transact over the internet. Write two benefits the owners can get because of this new change?
   (ii) As the business progresses, the company decides to increase employee insurance and employee benefits for its employees. What is the type of business transaction used here?
   (iii) Mention three advantages and disadvantages the customers can have, in trust between the service provider and the receiver, using e-commerce.
   (iv) Briefly explain the function of the virtual storefront in e-business. Give two examples for it.
   (v) Write two types of secure payments that can be used for online transactions.
   (vi) Identify and write down two procedures that can be used to promote the marketing of goods and services among consumers in an electronic market.

   (b) Global warming, recycling, use of eco-friendly products and waste reduction are some of the most commonly discussed topics today. In addition, green computing has become one of the most sought-after topics.
   (i) Explain what green computing means.
   (ii) Briefly explain the 3R method we can follow in green computing

   (c) Computer memory can speed up computer performance. Cache memory is a type of memory that directly affects computer performance.
   (i) Explain the function of cache memory in the computer.
   (ii) There is a list of secondary storage devices in the column A of the table below. Specify the media used to store data on the device in the column B in front of the relevant device. .

Column A Secondary storage device	Column B Media used to store data
Blue - ray disks	
Floppy disks	
Pen drives	
Memory chips	

   (d) A Textile shop have decided to introduce the following new discount scheme for their sales promotion. Accordingly, the following discounts will be given for the total quantity of goods purchased at each purchase.

| Condition	Discount
1. If the total cost of goods is more than Rs.5000.00	The lowest of the selected items is reduced by the total price.
2. If the total cost of goods is more than Rs. 10000.00	The lowest of the selected items will be reduced from the total price and get a 30% discount on the highest price.

Use the above variables for flochart and python programming.		
price of goods	-	itemp
Total price	-	totalp
Lowest Price	-	minp
The highest price	-	maxp
Amount payable	-	amountp

(i) Draw a flowchart for algorithm to develop a computer program for customer who is purchasing goods according to the above discounts given by the shop.**(The price of each item is input by the barcode reader, and after inputting 0 from the keyboard, the amount payable is displayed.)**

(ii) Write the appropriate Python programmer for the above flowchart.

(iii) At the end of each purchase a receipt will be issued to the customer and write a python function to include the amount payable at the end of the existing **"sell.txt"** text file.

(e) (*a*) Draw the Entity relationship diagram to the system below. Denote your assumptions clear.

A vehicle marketing company called "Dream Vehicle" buys vehicles from its registered suppliers. When purchasing a vehicle, the registration number, type and purchase price are recorded. A supplier has a supplier's number, name, and email address. Customers come and inspect the vehicles and order the vehicles. The National Identity Card, Telephone Number and Address are available for identification of the customers. The vendors at the company make the order for each customer. There is an employee number, name and phone number to identify the sellers. Order processing includes the order number, date, discount, amount, and so on. A single customer can request multiple orders and there may be multiple vehicles in one order. A special prize will be awarded to each and every order for the promotion of sales activities of the institute. The prize will be determined by order.

(*b*) Introduce generalization and specialization based on the above-mentioned exorcism chart.
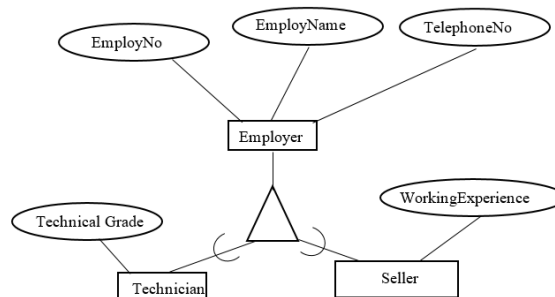
(f) (*a*) Motor vehicle section of Great Trust Insurance Company maintains a computerized information system to provide a reliable and efficient service for their clients. After purchasing a vehicle any applicant can forward an insurance request and the insurance officer of the motor vehicle section issues an application. After handing over the filled application to the insurance officer, eligible applicants become clients and they are provided an insurance certificate by the insurance officer. The applications are inserted in the application tray by the insurance officer and write the details of the applications in the computerized vehicle file and client file.

If a vehicle comes across an accident the client informs the accident details on the spot to the inquiry officer of the call center of the insurance company by giving a telephone call. Inquiry officer confirms the telephone call by checking the vehicle file and client file and forward to

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technical officer. Technical officer inspect the spot and prepare a inspection report and write inspection details to the accidents file. After garaging the vehicle, technical officer goes to the garage and prepare an estimation report and handover it to the garage. After repairing the vehicle a bill was set by the garage and hand over it to the technical officer and a copy of the bill is handed over to the client. Technical officer writes the bill details to the payments file. Client forwards the copy of the bill to the cashier and he confirms it by checking the accidents file and payments file. Cashier issues a receipt to the client with the payment.

Use the suitable words or phrases from the above scenario for filling the blanks indicated by the English capital letters in the following level one data flow diagram (Level 1 DFD)
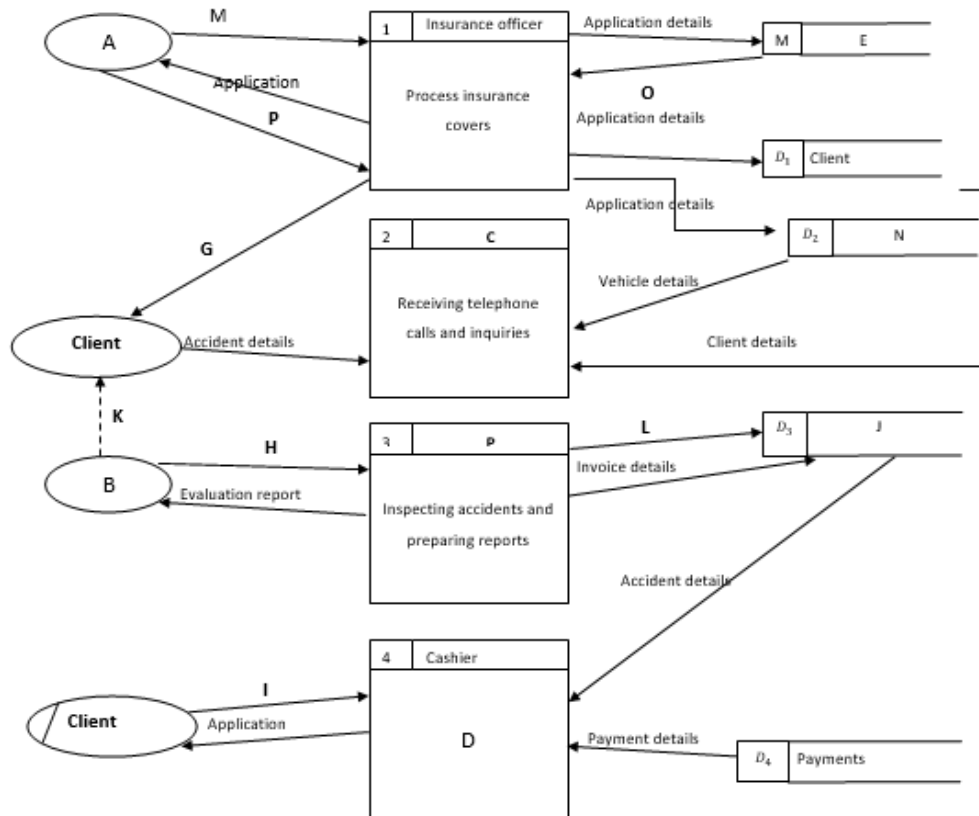
(b) Functional requirements and non-functional requirements are identified in system analysis stage.

(i) State briefly the difference between functional requirements and non -functional requirements

(ii) A list of requirements relevant to a library information system is given below. Name two functional requirements and non-functional requirements from the given list

  A. Provide opportunity to find the needed book for a member
  B. Ability to access online for the library system
  C. Ability to confirm the identity of a member
  D. Ability to access the library for whole 7 days of the week
  E. Ability to search all the members who used a certain book
  F. Search and get a book needed for a member very efficiently