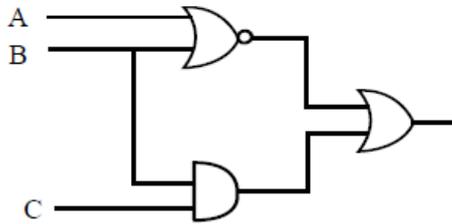


9. $AB_{16} + 456_8 =$

- (1) ABC_{16} (2) $D9_{16}$ (3) $1D9_{16}$ (4) AC_{16} (5) $AB2_{16}$

10. Consider the following combinational logic gate.



What is the simplified result of the above combinational logic gate?

- (1) $AB + C$ (2) $\bar{A}\bar{B} + BC$ (3) $AB + BC$ (4) $\bar{A}B + C$ (5) $\bar{A}\bar{B} + C$

11. Consider the following statements regarding the components of a system.

A - Input to a system could take a manual or automated method.

B - 'Processing' component is important as it supports to improve the quality of the input.

C - The output of a system could become an input of another system.

Which of the above statements is/are false?

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

12. What is the most practical method to remove a software application from a personal computer (PC)?

- (1) Delete all files of the software application
(2) Remove the icon for the application
(3) Uninstall the software application
(4) Delete the Folder of the software application
(5) Back-up the software application

13. Which of the following software is designed to be able to modify the source code of the programs?

- (1) Compilers (2) Open Source (3) Freeware
(4) Proprietary (5) Shareware

14. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called.

- (1) Fragmentation (2) Paging (3) Mapping
(4) Virtual memory (5) Swapping

15. In virtual memory system of an operating system, the page table contains.

- (1) base address of each page in physical memory (2) page offset
(3) page size (4) index
(5) driver

16. Which of the following statements is correct with respect to the HTML document?

- (1) The ` ` will display a new line between words "love" and "HTML".
(2) The `&` will display the output "&".
(3) The `<hr/>` tag will display a border around the text.
(4) The `>` will display a `<` symbol.
(5) The `` tag will display bold text.

17. Which of the following attribute is not available for the IMG tag?

- (1) src (2) lang (3) width (4) usemap (5) alt

18. Which of the following HTML code segment can be used to embed a video in an HTML page?

- (1) <embed href = "myvideo.wmv" width ="640" height ="400"> </embed>
(2) <embed style = "myvideo.wmv" width ="640" height ="400"> </embed>
(3) <src embed = "myvideo.wmv" width ="640" height ="400"> </src>
(4) <embed link = "myvideo.wmv" width ="640" height ="400"> </embed>
(5) <embed src = "myvideo.wmv" width ="640" height ="400"> </embed>

19. Consider the following statements regarding the structure of an HTML document.

- A – The TITLE element is a sub element within the HEAD element.
B – The BODY element contains the actual contents of the document.
C – An HTML document starts with the DOCTYPE element tag <!DOCTYPE HTML>

Which of the above statement(s) is/are correct?

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

20. Which of the following code will create the following lists on the web browser?

1. Coffee

- i. Black
- ii. Milk
- iii. Cappuccino

2. Tea

- c. Black
- d. Milk
- e. Green



```
(1)
<ol> <li> Coffee </li>
  <ol start="1" type="i">
    <li> Black </li><li> Milk </li><li> Cappuccino </li>
  </ol>
  <li> Tea </li>
  <ol start="3" type="a">
    <li> Black </li><li> Milk </li><li> Green </li>
  </ol>
</ol>
```

```
(2)
<ol> <li> Coffee </li>
  <ol start="1" type="i">
    <li> Black </li><li> Milk </li><li> Cappuccino </li>
  </ol>
  <li> Tea </li>
  <ol start="1" type="a">
    <li> Black </li><li> Milk </li><li> Green </li>
  </ol>
</ol>
```

```

(3)
<ol> <li> Coffee </li>
      <ol start="1" type="i">
        <li> Black </li><li> Milk </li><li> Cappuccino </li>
      </ol>
      <li> Tea </li>
      <ol start="3" type="c">
        <li> Black </li><li> Milk </li><li> Green </li>
      </ol>
    </ol>

```

```

(4)
<ol> <li> Coffee </li>
      <ol start="1" type="a">
        <li> Black </li><li> Milk </li><li> Cappuccino </li>
      </ol>
      <li> Tea </li>
      <ol start="3" type="a">
        <li> Black </li><li> Milk </li><li> Green </li>
      </ol>
    </ol>

```

```

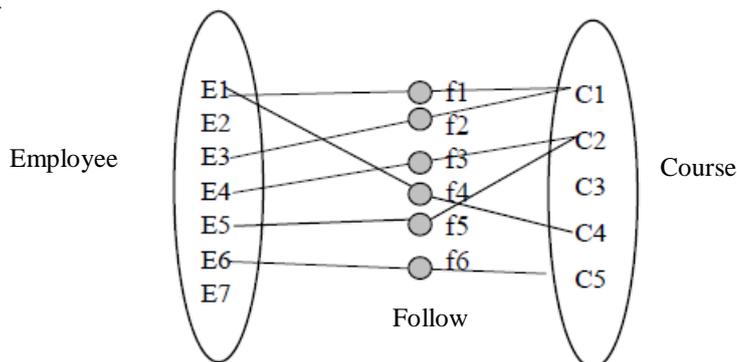
(5)
<ol> <li> Coffee </li>
      <ol start="a" type="i">
        <li> Black </li><li> Milk </li><li> Cappuccino </li>
      </ol>
      <li> Tea </li>
      <ol start="3" type="a">
        <li> Black </li><li> Milk </li><li> Green </li>
      </ol>
    </ol>

```



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21. Following is a mapping of instances of Employee and Course entities related by the relationship named “follow”.



Which of the following is true for the mapping of the above relation named “Follow”?

- A - Each employee follows a Course.
- B - An Employee may follow many Courses.
- C - Some Employees may not follow a Course.

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

22. In HTML, which pair of tags is used to define a table row and a table cell respectively?

- (1) TH, TR (2) TD, TR (3) TR, TH (4) TR, TD (5) TD, TH

23. Consider the following statements regarding a relation in a relational database.

- A – Each relation in a database should have a unique name.
B – Primary key of a relation should be the first column.
C – Intersection of each row and column is single valued.
D – Each attribute within a relation has a unique name.

Which of the above is/are true about a relation?

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

24. Consider the followings.

- A – Frequency Division multiplexing B – Code Division Multiplexing
C – Time Division Multiplexing D – Digital Division Multiplexing

Which of the above is /are the multiplexing techniques used for media sharing?

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

25. In relational databases, “Data Redundancy”.

- A - can lead to inconsistency of data.
B - is reduced by normalization.
C - has no effect on data integrity.
D - is a problem with traditional file systems.

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

26. Consider the relation below and the given functional dependency (FD).

Employee (EmpID, Name, Address, Phone, Father, Skills)

FD : Address → Phone

A – Relation Employee is currently in 3NF.

B – Relation Employee is in 1NF.

C – The relation can be further decomposed as Employee (EmpID, Name, Address, Father, Skills) and Emp_Phone (Address, Phone)

Which of the above statements is/are correct?

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

27. Determining the requirements of the new system is carried out during which phase of the traditional systems development life cycle is called.....

- (1) Systems Design (2) Testing (3) Systems Analysis
(4) Implementation (5) Review

28. “..... feasibility is a measure of the cost-effectiveness of a project or a solution”.

Select the phrase suitable to complete the above statement.

- (1) Technical (2) Economical (3) Operational
(4) Schedule (5) Legal

29. Which of the following task is carried out during the systems implementation phase of traditional systems development life cycle?

- (1) User training (2) Testing newly developed system
(3) Designing user interfaces (4) Gathering requirements of the new system
(5) Reviewing existing system

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

```
t = [ 'a','b','c' ]  
t[1:3]=[ 'x','y' ]  
print (t)
```

- (1) ['a', 'b', 'c'] (2) ['a', 'x', 'y'] (3) ['x', 'y'] (4) ['a', 'b', 'c', 'x', 'y'] (5) ['a']

36. What is the output of the following python program?

```
A = [1,2,3]  
b = [1,2,3]  
r = a is b  
print (r)
```

- (1) True (2) False (3) true (4) false (5) [1,2,3]

37. Advantages of B2C commerce to customers are:

- A - Wide variety of goods can be accessed and comparative prices can be found.
- B - Shopping can be done at any time.
- C - Privacy of transactions can be guaranteed.
- D- Security of transactions can be guaranteed.

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

38. In a Data flow diagrams (DFD), data cannot flow between a store and.

A- a store B - a process C - an external entity

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

39. Output of the python statement print ([1,2]*2) is.

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

40. During system study, data can be collected through.

A – Questionnaire B – Interviews C - On-site observations

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

41. Which of the following is/are the benefits of e-marketing?

A - Speed B - Reach C - Efficiency
D - Low Cost E – Target customers

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

42. What is the result of (4 >> 2) in a python program?

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

43. Consider the following statements regarding computer programs.

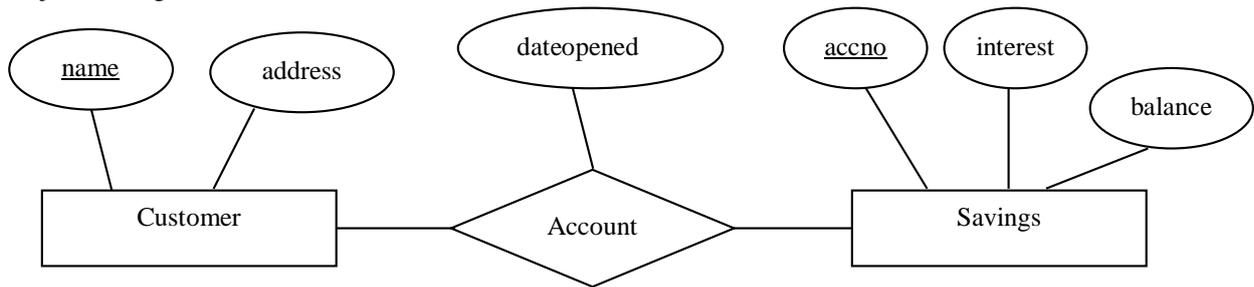
- A – Syntax is the structure of a program.
 - B – Semantics is the meaning of a program.
 - C – Debugging is the process of finding and removing any kinds of programming errors.
- Which of the above is/are correct?

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

44. Correct HTML tag for the largest heading is.

- (1) <head> (2) <h6> (3) <heading> (4) <h1> (5) <h4>

45. A bank has savings accounts. A customer may open many savings accounts and the bank does not allow joint savings accounts.



Which of the following is/are the most suited relation(s) if the above diagram is mapped into a relational model?

- A – Customer (name, address) B – Savings (accno, interest, balance)
 C – Account (name, accno, dateopened) D – Savings (accno, interest, balance, name, dateopened)
 (1) A only (2) B only (3) C only (4) A, D only (5) A, B, D only

46. In the relational model, the number of attributes and number of tuples in a relation are termed as and.....respectively.

- (1) Cardinality, domain (2) Degree, cardinality (3) Domain, degree
 (4) Cardinality, degree (5) Domain, cardinality

47. Desirable characteristic(s) of a memory system is /are.

- A – High speed B – Low power consumption C – High density
 (1) A only (2) B only (3) C only (4) A, B only (5) A, B, C all

48. Consider the two tables, Department and Employee. If many employees are working for a department and only one employee can work for one and only one department, in which table should the corresponding foreign key be placed?

- (1) Foreign key needed only in Department table
 (2) Foreign key needed only in Employee table
 (3) Foreign key needed in both tables
 (4) A new table has to be defined including the primary keys of both Employee and Department tables.
 (5) No foreign keys should be used.

49. Consider the followings regarding database normalization.

- A - 1NF contains multi values and no repeating values.
 B - 2NF does not contain multi values and contains partial dependency.
 C - 3NF does not contain any transitive dependency.

Which of the following is/are correct?

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

50. Consider the following statements regarding user defined function in python program.

- A - A function is a named sequence of statements that performs a computation.
 B - When creating a variable inside a function, it is called local variable.
 C - Functions can make a program smaller by eliminating repetitive code.

Which of the above is/are correct?

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

G.C.E. (A/L) Examination – November 2015

Conducted by Field Work Center, Thondaimanaru.



In Collaboration with the Zonal Education Office, Jaffna

Information & Communication Technology (ICT)

Grade - 13 (A/L) 2016

Part - II

Time: 3 Hours

Part II - A Structured Essay

Answer all the questions

1.

(a) Write down well-formed HTML code segments for the following results rendered on a webpage.

(i) Tom & Jerry

(ii) <html >



(b) Write down HTML code segment to insert an image, named "bird.png", on a web page and assume that the alternate text is "birds".

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(c) Fill in the following HTML code segment written to render the table given below.

Subjects	Marks	
ICT	78	98
Physics	90	76

```
<.....1.....border = "1" >  
<.....2.....>  
<th> Subjects </th>  
<th .....3.....> Marks </th>  
<.....4.....>
```

```
<tr>  
<td> ICT </td>  
<td> 78 </td>  
<td> 98 </td>  
</tr>
```

```
<tr>  
<td> Physics </td>  
<td> 90 </td>  
<td> 76 </td>  
</tr>  
<.....5.....>
```

1.

2.

3.

4.

5.

2. The table below stores details of students and the overall grade each student obtained in different modules. The table has a composite primary key (StudentID, ModuleID).

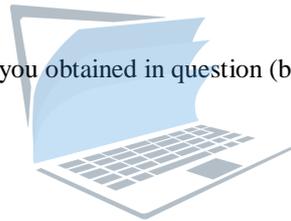
Results

<u>StudentID</u>	StudentName	<u>ModuleID</u>	ModuleName	Grade
S001	Smith	M01	Java	A
S001	Smith	M02	Databases	B
S002	Ford	M01	Java	B

(a) Which Normal Form does the above table violate and why?

(b) Normalize the table up to the normal form identified in question (a).

(c) Draw an ER diagram for the entities you obtained in question (b)



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(d) Write down type of the cardinality in the ER diagram drawn in (c) and justify your answer.

3. Consider the following python program.

```
# fib.py

def call():
    a, b = 0, 1
    while b < 10:
        print (b, end = ' ')
        a, b = b, a + b
call()
```

(a) Write down the followings in the table referring to the python program given above.

	Column A	Column B
(i)	Identifiers	
(ii)	A conditional statement	
(iii)	Program comments	
(iv)	File name of the python program	
(v)	A function call	
(vi)	Variables	
(vii)	The statements repeated by the loop	
(viii)	Arithmetic operator	

(b) Consider the following python program.

```
n = 1
sum = 0
while n <= 10:
    sum = sum + n
    print (sum, end= ' ')
    n = n+1
```

Rewrite this code using a 'for' loop again.



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(c) Briefly explain the following e-commerce services with appropriate examples.

	Services	Explanation
(i)	B2C	
(ii)	C2C	
(iii)	G2C	

4.

(a) Write down 17_{10} and (-6_{10}) in one's complement 8-bits method. Show your calculations.

(b) Use one's complement 8-bits method to add numbers 17_{10} and (-6_{10}) . Show your calculations.

(c) Write down the names of the phases of System Development Life Cycle (SDLC) for each of the following descriptions.

	Description	The phase of SDLC
(i)	Making minor changes to hardware, software, and documentation to support system's operational effectiveness.	
(ii)	Checking to ensure that the newly developed system meets user requirements.	
(iii)	Gathering user requirements.	
(iv)	Studying the limitations and problems of the present system.	

(d) The following sentences are regarding operating system. Write down suitable words from the list given below.

	Description	Suitable Words
(i)	A program in execution.	
(ii)	A process can be swapped temporarily out of memory to a backing store and then brought back into memory for continued execution.	
(iii)	Increases CPU utilization by organizing jobs so that the CPU always has one to execute.	
(iv)	To obtain better memory-space utilization, a program is not loaded until it is called.	

Lists: [Multi-programming, context switch, swapping, scheduling, Dynamic loading, Process, memory, operating system, process control block (PCB)]

Part II - B Essay Questions
Write down any four questions only

1.

Three people take part in an electronic voting, A, B, and C. Each has a button that provides a logical input to a circuit. The input is 0 (vote against) or 1 (vote for). A logic circuit is to be designed to determine the **majority vote**.

- (a) Draw a truth table to represent all voting outcomes.
- (b) From the truth table, derive a Boolean expression without simplification.
- (c) Simplify the Boolean expression obtained in (b). Show all the Boolean Laws clearly.
- (d) Draw a logic circuit to implement the voting mechanism using AND, OR and NOT gates only.

2.

The 'Sweet Treat' company is sells sweets and cakes to the public. The proprietor is very keen on baking and specializes in making homemade sweets and cakes for sale in the shop. As well as making a lot of the confectionery sold in the shop, the proprietor also buys sweets and some cakes from suppliers to increase the range of products for sale.

The proprietor keeps records of the quantities of stock he has on hand. The stock includes raw ingredients for his baking, and also the sweets and cakes he buys from suppliers. Once a week the proprietor checks the stock to dispose of anything that is past its 'sell by' date. He also checks to see if any raw ingredients or any pre-made sweets and cakes need to be ordered from the suppliers. The proprietor orders supplies on a 'Cash on Delivery' basis, so all deliveries are paid for immediately they arrive.

At the end of each day the proprietor checks how many of each homemade item have been sold. He keeps a record of these sales, and uses this to decide how many of each cake or sweet to make for the following day.

- (a) List the processes, data stores and the external entities that you would include on a top level data flow diagram (DFD) of the Sweet Treat company [No need to draw DFD].

3.

- (a) What is the difference between a syntax error and a run-time error?
- (b) A health care company is planning to create a mobile application to indicate Body Mass Index (BMI), so that their patients can work out if they are a healthy weight for their height. The formula used for this calculation is:

$$\text{BMI} = W / H^2$$

Where:

BMI = Body Mass Index, H = Height (measured in metres) and W = Weight (measured in kg)

- (i) Write a pseudocode to calculate the BMI using the formula given above.
- (ii) Draw a flowchart in which the input variables are H and W, and the outputs are BMI and Category; the following data is used to determine Category.

BMI	Health Category
Less than or equal to 18.5	Underweight
Greater than 18.5 to 25.0	Normal
Greater than 25.0 to 30.0	Overweight
Greater than 30.0	Obese

4.

A University has adopted a personal identity card (**PID**) system to improve security and to restrict access to certain **groups** of people (such as students, teachers, professors, secretaries, managers.etc.) and at certain times and dates. A person is issued a PID card as soon as they become part of the University community (either employed or on a course of study). Each person belongs to only one group which determines what buildings they can access.

To enter a building, a person (each having a unique personID) must have permission which is established when their PID card is swiped through a PID card reader outside the **building** they wish to enter. A **PID card reader** is located outside the door of a building users wish to access. Permission is granted only if their access credentials are successful. If access is allowed, the captured data is logged, recording the date, personID (from the PIDcard) and the PIDreaderID.

(a) Draw an ER diagram of the above scenario. State the following.

- Cardinality expressed as either one-to-one, one-to-many or many-to-many.
- Primary keys and attributes.
- Any assumptions you made.

5.

(a) Write down the major differences between ADSL and ISDN.

(b) Explain briefly the Round Trip Time (RTT).

(c) Compare and contrast star and bus topologies with the help of suitable diagrams.

(d) Write down three differences between peer-to-peer (P2P) and client-server network models.

6.

e-driving license project plan is to provide new smart cart driving license instead of using traditional vehicle driving license system in Sri Lanka. This new driving license would contain the details such as photograph, name, address and blood group of driver. These details would be seen by the traffic police officers. Other details such as fingerprint, accident history done by the driver on roads, and fine are stored in e-driving license with the help of electronic chip technology. These details are necessary to protect from unauthorized people. Police officers serving on roads are accessible to read these details with the help of wireless technology. These details will be connected with the centralized database in Colombo.

(a) Write down two functional requirements of this proposed computerized system.

(b) Write down any three ways that the police officers or department of traffic may legally regulate drivers by using new e-driving license.

(c) State two possible advantages that the department of traffic, Sri Lanka would obtain by introducing this new e-driving license.

(d) Except the chip technology, write down two card technologies that would be used for data storage, machine reading and information encoding.
