

G.C.E. (A/L) Examination – June 2019
Conducted by Field Work Center, Thondaimanaru.
In Collaboration with Northern Provincial Education
Department
Information & Communication Technology (ICT)



Gr. 13 (A/L) 2019

Part - I

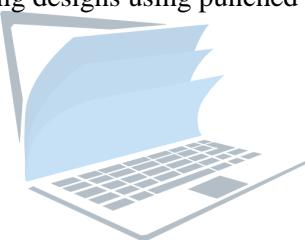
Time : 2 hrs

Instructions:

- ❖ Answer all questions
- ❖ Write down your index number on the space provided.
- ❖ In each of the questions 1 to 50, pick one of the alternatives (1),(2),(3),(4),(5) which is correct or most appropriate. Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- ❖ No use of calculators.

1. Who introduced the concept of controlling designs using punched cards using weaving machine?

- (1) Blaise Pascal
- (2) Herman Hollerith
- (3) Charles Babbage
- (4) Joseph Jacquard
- (5) John Von Neumann



2. $0.171875_{10} =$

- (1) 0.01011_2
- (2) 0.001101_2
- (3) 0.001011_2
- (4) 0.001110_2
- (5) 0.000111_2

3. Which of the following(s) is/are equivalent to the Boolean expression $(x + \bar{y})(x + y)(y + \bar{y})$?

- A - $(x + \bar{y})(x + y)$
- B - x
- C - y
- (1) A only
- (2) B only
- (3) C only
- (4) A,B only
- (5) A,C only

4. Programs which are designed to accomplish a specific set of tasks is called

- (1) System software
- (2) Application software
- (3) Open source software
- (4) Utility software
- (5) Operating system

5. A set of rules governing communication is called.

- (1) Protocol
- (2) Acknowledgement
- (3) Media
- (4) Transfer
- (5) Topology

[see page 2]

6. The fastest storage unit in arithmetic logic unit of a microprocessor is

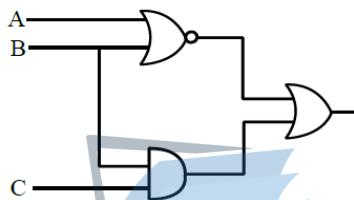
- (1) Cache memory
- (2) Hard disk
- (3) Control unit
- (4) Magnetic disk
- (5) Register

7. CAF_{16} is equivalent to.

A – 128_{10}
B – 110010101111_2
C – 6257_8

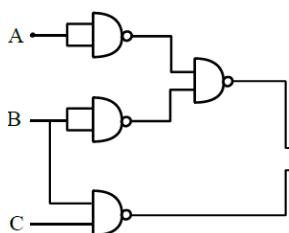
- (1) A only
- (2) B only
- (3) A,B only
- (4) B,C only
- (5) A,B,C all

8. Consider the following logic circuit.



Which of the following logic circuit consists of the output of the logic circuit given above?

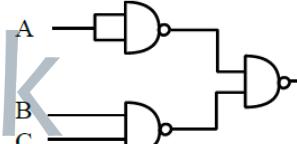
(1)



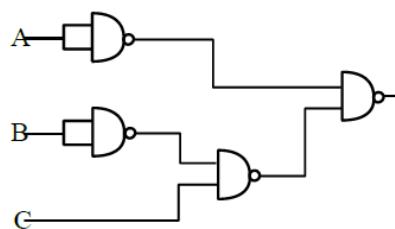
(2)



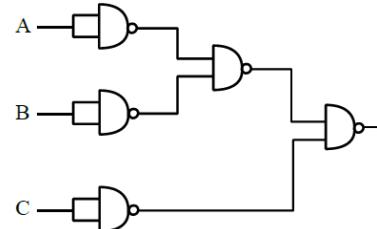
(3)



(4)



(5)



9. Which of the following SQL command is categorized as data definition language (DDL)?

- (1) select
- (2) create
- (3) update
- (4) delete
- (5) insert

10. How many layers are there in TCP/IP network reference model?

- (1) 7
- (2) 5
- (3) 4
- (4) 8
- (5) 6

[see page 3]

- 11.** In data communication, which of the following is the characteristic of packet switching comparing with circuit switching?
- (1) Dedicated physical path
 - (2) Packets arrive in order
 - (3) Continuous transmission of data
 - (4) Packets follow the different route
 - (5) Fixed use of bandwidth
- 12.** What method can be used by two computers to ensure that packets are not dropped because too much data is being sent too quickly?
- (1) Detecting error
 - (2) Transfer
 - (3) Flow control
 - (4) Correcting error
 - (5) Modulation
- 13.** What happens if part of an FTP message is not delivered to the destination?
- (1) The entire FTP message is re-sent
 - (2) The part of the FTP message that was lost is re-sent
 - (3) The message is lost because FTP does not use a reliable delivery method
 - (4) The FTP source host sends a query to the destination host
 - (5) All FTP message transfers are given up
- 14.** Consider the following user requirements of a water heater used in bathrooms.
- A – It should be able to heat water than ambient temperature
B - It should be able to pump water in high speed
C - It should not be able to heat water more than 90°C
- Which of the above is /are only functional requirements?
- (1) A only
 - (2) B only
 - (3) C only
 - (4) A,B only
 - (5) B,C only
- 15.** Which of the following is incorrect?
- (1) www.alibaba.com is an example for B2B
 - (2) www.wikipedia.com is an example for B2E
 - (3) www.ebay.com is an example for C2C
 - (4) www.doenets.lk is an example for G2C
 - (5) www.aliexpress.com is an example for B2C
- 16.** What is the output of Python statement $6>>5^3$?
- (1) 1
 - (2) 2
 - (3) 3
 - (4) 4
 - (5) 5

[see page 4]

17. Which of the following function of basic input-output system (BIOS) of computer?

- (1) It gives physical interfaces to various devices
- (2) It gives programs to communicate central processing unit with other devices
- (3) It provides memory spaces for uploading applications from hard disk
- (4) It provides electric power to work computer
- (5) It provides memory spaces needed for computer

18. Consider the following statements about Python tuple.

- A - It is an unordered data type
- B - It is an immutable / unchangeable data type
- C - It allows duplicate members

Which of the above is /are correct?

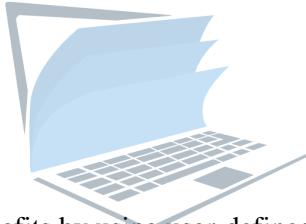
- (1) A only
- (2) B only
- (3) C only
- (4) A,C only
- (5) B,C only

19. Consider the following Python statements.

- A - {4,6,5}
- B - {1:'Apple', 2:'Banana'}
- C - [3,5,4]
- D - (7,5,6)

Data types of these statements are respectively.

- (1) dictionary, set, list, tuple
- (2) dictionary, list, set, tuple
- (3) set, list, tuple, dictionary
- (4) set, dictionary, list, tuple
- (5) set, list, tuple, dictionary



20. Which of the followings is /are the benefits by using user-defined functions in Python programs?

- A - It reduces duplications of coding
- B - It allows reuse of coding
- C - Improving efficiency of coding

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

21. What is the output of the following Python statement?

```
x = 1
y = 2
while x!=3:
    z = x+y
    print(z, end=' ')
    x = x+1
    y = y+1
```

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

[see page 5]

22. Which of the following is correct about commercially off-the-shelf software (COTS)?

- A - They are developed in order to accomplish specific users' requirements
 - B - Most of its facilities are used by users comparing with customized software
 - C - They are inexpensive comparing with customized software
- (1) A only (2) B only (3) C only (4) A,B only (5) A,B,C all

23. Two's complements of (9_{10}) and (-8_{10}) are respectively.

- (1) 10101111_2 , 10101111_2
- (2) 10001111_2 , 10001111_2
- (3) 00001001_2 , 11111000_2
- (4) 11101111_2 , 01110001_2
- (5) 11111111_2 , 11100010_2

24. Which of the following is incorrect statement about high-level computer programs?

- (1) They should be converted to machine language to be executed
- (2) They are executed faster than low-level computer programs
- (3) It is easy to correct errors comparably
- (4) They are easy to write rather than low-level computer programs
- (5) Program translators are needed to be executed such programs

25. Consider the following about twisted pair copper cable.

- A - Shielded twisted pair (STP) cable has improved noise reduction qualities than unshielded twisted pair (UTP) cables
 - B - Unshielded twisted pair is more expensive than shielded twisted pair cables for a given length
 - C - Co-axial cable is a type of twisted pair cable
- Which of the above is/are correct?
- (1) A only (2) B only (3) C only (4) A,C only (5) A,B,C all

26. Consider the following statements about domain name system (DNS).

- A - It is based on client-server architecture
- B - It is used to register domain names for websites
- C - It is a hierarchical system

Which of the above is /are correct?

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

27. Which of the following CSS code can be used to display a border around a text?

- (1) p {border-type: 5px solid red;}
- (2) p {width: 5px solid red;}
- (3) p {border: 5px solid red;}
- (4) p {color: 5px solid red;}
- (5) p {length: 5px solid red;}

[see page 6]

28. A relational database table in zero normal form (0NF) is converted to first normal form (1NF) by reducing

- (1) Duplicate values of its fields
- (2) Duplicates of rows in a table
- (3) Duplicates of attributes in a table
- (4) All the attributes which are not dependent on primary key
- (5) Partial dependencies

29. Which of the following is true about handling e-mail?

- (1) Post office protocol (POP) forwards e-mail from sender's computer to mail server
- (2) Internet mail access protocol (IMAP) forwards e-mail from sender's computer to mail server
- (3) Simple mail transfer protocol (SMTP) forwards e-mail from sender's computer to mail server
- (4) e-mail is always sent to recipient instantly
- (5) Sender and recipient should be in online

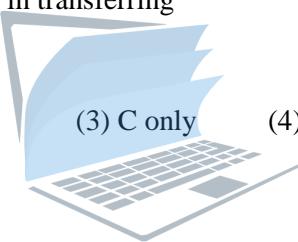
30. Consider the following statements about HTTP POST.

- A - It is suitable to handle sensitive data
- B - It contains a limit in amount of data in transferring
- C - It can be bookmarked

Which of the above is /are correct?

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

31. Consider the following statements.



- It is difficult to adapt frequently changing user requirements
- It is considered as a linear development model
- It is suitable for software development that consists of clear and stable user requirements

Which of the following is the most appropriate software process model relating to the statements given above?

- (1) Incremental and iterative model
- (2) Agile model
- (3) Spiral model
- (4) Rapid application development (RAD) model
- (5) Waterfall model

32. Which of the following function can be used to open the connectivity of MySQL database in web development?

- (1) mysql_error()
- (2) mysql_query()
- (3) mysql_close()
- (4) die()
- (5) mysql_connect()

[see page 7]

33. Consider the following data table.

Inventory (PartNo, Warehouse, Location, Quantity, Weight, Colour)

Weight, Colour are dependent on PartNo

Quantity is dependent on (PartNo, Warehouse)

Location is dependent on Warehouse

Which of the following is correct about this table?

- (1) It is in 0NF
- (2) It is in 1NF
- (3) It is in 2NF
- (4) It is in 3NF
- (5) Data are not enough to determine its normal form

34. Consider the following database tasks.

- (i) modifying data in table
- (ii) modifying field names of table
- (iii) removing a table
- (iv) removing rows in a table

SQL commands to accomplish the tasks given above are respectively.

- (1) (i) UPDATE (ii) ALTER (iii) DELETE (iv) DROP
- (2) (i) UPDATE (ii) DELETE (iii) DROP (iv) ALTER
- (3) (i) UPDATE (ii) DROP (iii) ALTER (iv) DELETE
- (4) (i) UPDATE (ii) ALTER (iii) DROP (iv) DELETE
- (5) (i) DELETE (ii) ALTER (iii) DROP (iv) UPDATE

35. Consider the following HTML webpage.

The diagram shows a screenshot of a web browser displaying an HTML form. The form has a light gray background and contains the following elements:

- A label "Enter details:" followed by a text input field.
- A label "First name:" followed by a text input field containing "Mickey".
- A label "Last name:" followed by a text input field containing "Mouse".
- A "Submit" button at the bottom left.

Two arrows point from the text "①" and "②" to specific parts of the form:

- Arrow ① points to the "Enter details:" label and its associated text input field.
- Arrow ② points to the right side of the "Submit" button.

HTML tags to create the labels indicated by ① and ② are respectively.

- (1) <input>, <fieldset>
- (2) <legend>, <input>
- (3) <legend>, <fieldset>
- (4) <fieldset>, <submit>
- (5) <legend>, <html>

[see page 8]

36. Consider the following relational database table.

Employee

EmpID	Name	Address	Salary
E001	K. Raj	Jaffna	75000
E002	A.R. Alwis	Galle	60000
E003	W.M.N. Perera	Kandy	80000

Which of the following SQL statement can be used to change Salary field of a table into BasicSalary field?

- (1) alter table Employee change Salary BasicSalary float(8);
- (2) alter table Employee Salary change BasicSalary float(8);
- (3) alter table Employee add Salary BasicSalary float(8);
- (4) alter table Employee Salary BasicSalary float(8);
- (5) alter table Employee insert Salary BasicSalary float(8);

37. In an operating system, the interval from the time of submission of a process to the time of completion is termed as.

- (1) Waiting time
- (2) Turnaround time
- (3) Response time
- (4) Throughput
- (5) Swapping



38. In an operating system, is a data structure, it consists of necessary information for scheduling of specific process.

Which of the following is suitable to fill the blank in?

- (1) Frame
- (2) Context switch
- (3) Process control block (PCB)
- (4) Data compaction
- (5) Page

39. Consider the following statements about cookie.

A - A cookie is used to identify a user

B - A cookie is a small file that the server embeds on the user's computer

C - Each time the same computer requests a page with a browser, it will send the cookie too

Which of the above is /are correct?

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

40. If a network address is 148.75.0.0/26, what is the maximum number of hosts that can be connected on this network?

- (1) 64
- (2) 32
- (3) 62
- (4) 30
- (5) 126

[see page 9]

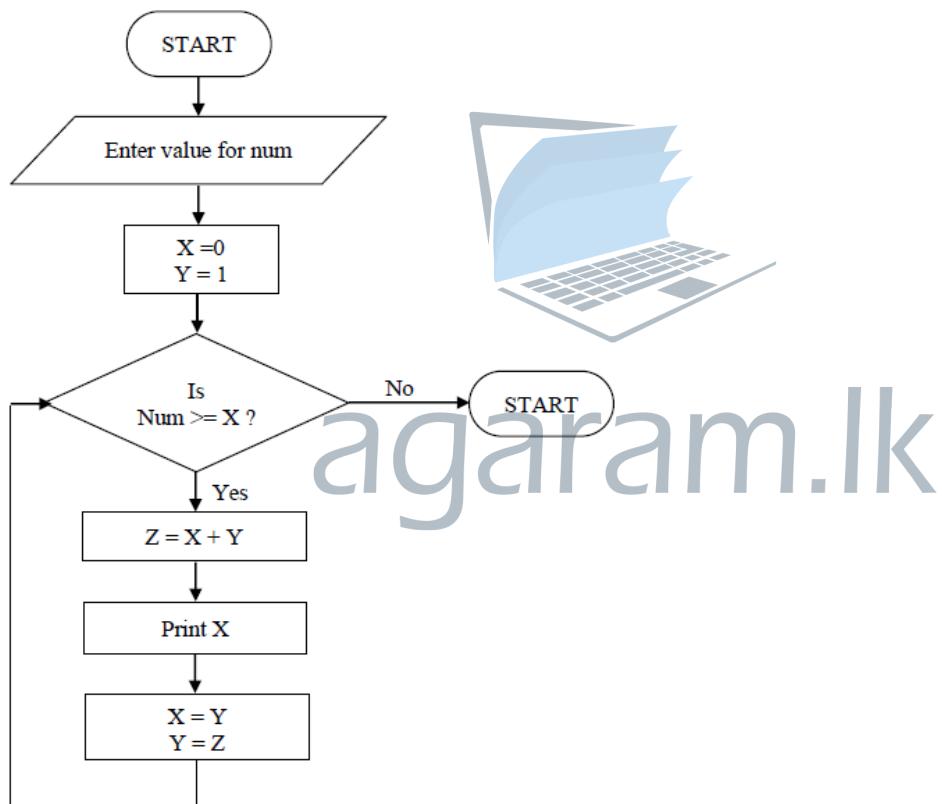
41. Which of the following may be considered as the applications of Internet of Things (IoT)?

- A - Monitoring health of farm animals using devices
 - B - Driving automatically vehicles such as cars
 - C - Monitoring environmental pollution in cities and providing mechanism to control it
- (1) A only (2) B only (3) C only (4) A,B only (5) A,B,C all

42. Which of the following statement about relational database keys?

- (1) Primary key is a subset of candidate keys
- (2) Foreign key is a subset of candidate keys
- (3) Alternate key is a subset of candidate keys
- (4) Composite key is a primary key
- (5) Candidate key helps to identify records uniquely in a table

43. Which of the following is correct statement about the following flowchart?



- (1) Output 0 1 is obtained while value 1 is assigned to num
- (2) Output 0 1 2 is obtained while value 2 is assigned to num
- (3) Output 0 1 3 is obtained while value 3 is assigned to num
- (4) Output 0 1 1 2 3 is obtained while value 4 is assigned to num
- (5) Output 0 1 2 3 4 5 is obtained while value 5 is assigned to num

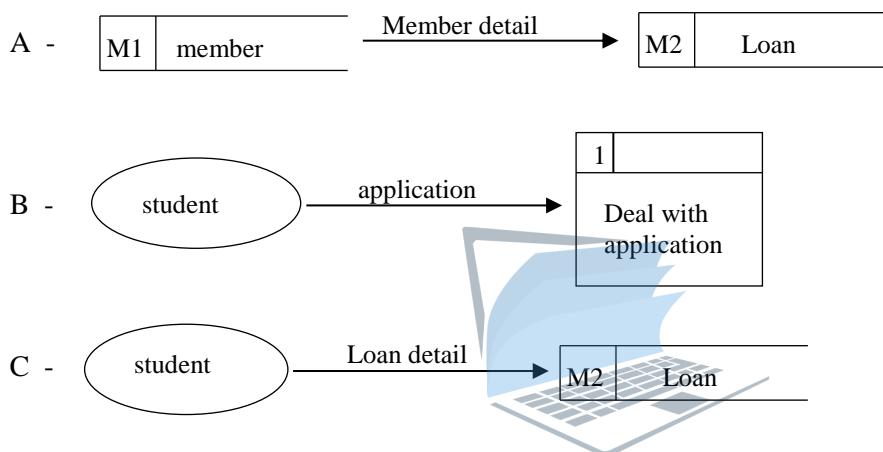
[see page 10]

44. Operating system uses various ways to do space allocation for the files. Out of them, “..... creates a table of pointers (index) at the time of the file creation”.

Which of the following is appropriate to fill the blank in?

- (1) linked allocation
- (2) Memory allocation
- (3) Contiguous allocation
- (4) Indexed allocation
- (5) Hard disk allocation

45. Consider the following segments of dataflow diagram (DFD).



Which of the above is /are valid data flow(s) in the segments of the dataflow diagram given above?

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

46. What is the output of the following Python program?

```
ar = [1,2,3,4,5,6]
i = len(ar)-1
while i>=0:
    print (ar[i], end = ' ')
    i=i-1
```

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

[see page 11]

47. If the program given above in question 46 as follows, what will output be?

```
ar = [1,2,3,4,5,6]
i = len(ar)-1
while i>=0:
    if i<2: break
    print(ar[i], end=' ')
    i=i-1
```

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

48. Consider the following statements about agent technology.

- A - Software agent is a computer program which works autonomously towards goals in a dynamic environment on behalf of another entity (user) over extended period of time
- B - A multi-agent system is a network of problem-solving entities called agents that work together to find answers to problems that are beyond the individual abilities of each agent.
- C - Intelligent agent is an autonomous entity which observes through sensors and acts upon an environment and directs its activity towards achieving goals.

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

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

49. An Information System that either helps to identify decision-making opportunities or provides information to help make decisions is called.

- (1) Expert system
- (2) Transaction processing system
- (3) Decision support system
- (4) Executive support system
- (5) Office automation system

50. Consider the following statements.

- A - Reducing congestion of network
- B - Making simplicity of network management
- C - Improving network's performance
- D - Improving network's security

Which of the above is /are the benefits of subnetting a computer network?

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

[end]



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Part – II A

Time : 3 hrs

Structured Questions

Answer for all questions

1.

(a)

(i) Fill the blanks in with e-commerce types in the following table for all the situations given below.

	Situations	e-Commerce type
(i)	Amazon is selling books for customers via the Internet
(ii)	Sri Lankan Government is releasing examination results for the students via www.doenets.lk
(iii)	A customer is monitoring his/her account balance using the Internet banking services of a commercial bank in Sri Lanka
(iv)	A person is selling his/her used car to another customer via the Internet

(ii) Give two usages of a shopping cart used in an e-commerce website.

.....

.....

.....

.....

.....

(iii) Explain briefly, with the help of any two example, how a software agent can be used to know preferences of customers in an e-commerce website.

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நான் எதுவும்
எழுதலாகாது

.....

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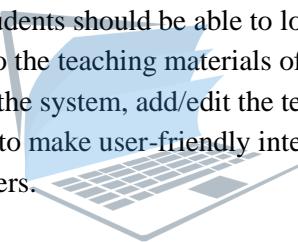
.....

.....

.....

(b) Consider the following scenario.

A private tuition institute wants to develop an educational web site which will cater to the needs of students in the age group of 6 -16. Students should be able to register with the system by paying the annual registration fee. Registered students should be able to login to the system by using their computers and they should have access to the teaching materials of all registered courses. Teachers in the institute should be able to login to the system, add/edit the teaching materials and set and evaluate online tests. The institute needs to make user-friendly interfaces and implement a robust system to deal with errors by ignorant users.



(i) Write down two functional requirements of this system.

agaram.lk

.....

.....

.....

.....

(ii) Write down two non-functional requirements of this system.

.....

.....

.....

.....

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எழுதலாகாது

(c) Simplify the following Boolean expression using Boolean Laws. Clearly show your computations.

$$\overline{AB + AC} + \bar{A}\bar{B}C$$

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ஏழாக்காது

2.

(a) State whether the following statements is **True**, if it is correct, or **False**, otherwise.

- (i) Cardinality of a relation is a number of attributes it contains
 - (ii) Degree of a relation is a number of records it contains
 - (iii) A domain is the set of allowable values for an attribute
 - (iv) Primary key is a subset of candidate keys

(b) Consider the following Employee table.

EmpID	EmpName	Address	Salary
E001	Anushkha	15, School Lane, Jaffna	70000
E002	Sivarajah	23/5, RK Road, Galle	85000
E003	Sathun	Nawala Road, Nugegoda	65000
E004	Perera	Peradeniya Road, Kandy	80000
E005	Alwis	67, Vimala Lane, Trincomalee	60000

Write down SQL statements for the following scenarios using the table given above.

- (i) Obtaining all details of employees whose name starts with the letter ‘S’.

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(ii) Obtaining all details of employees according to ascending order of employees' salary.

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(iii) Giving 10% bonus of salary for all employees (result should be obtained with the titles given below)

Salary	Bonus
70000	7000
85000	8500
65000	6500
80000	8000
60000	6000



(c) Write down in column Y for column X from the list given below.

[Technical feasibility, economic feasibility, operational feasibility, cultural feasibility, legal feasibility, schedule feasibility]

	Column X	Column Y
(i)	Evaluating how the system works?	(A)
(ii)	The measurement of a project cost	(B)
(iii)	Knowing that does the system work with organizational climate?	(C)
(iv)	The measurement of how a project takes the time period reasonably?	(D)

(d) If the following characteristics are of circuit switching, state true or ,otherwise, false.

- Using of a dedicated physical path (.....)
- Data packets are received in an order (.....)
- Data packets are moving in different routes (.....)

3.

(a) Write down HTML code segment for each of the followings.

(i) Adding an image (name of the image is nature.gif)

.....
.....

(ii) Adding a video (Name of video is video.mp4)

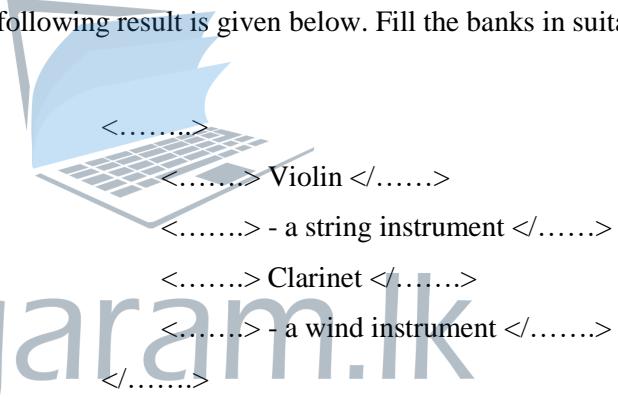
.....
.....

(iii) Adding a sound file (name of sound file is song.mp3)

.....
.....

(b) The HTML code segment to obtain the following result is given below. Fill the banks in suitably.

Violin
- a string instrument
Clarinet
- a wind instrument



(c)

(i) Write down a CSS code segment to link an external CSS file named ‘register.css’ with a file named ‘myfile.html’ (assume that both files are in the same folder).

.....

(ii) Consider the following CSS definition.

h1 { font-family: arial; }

Write down the followings about CSS definition given above.

Selector :

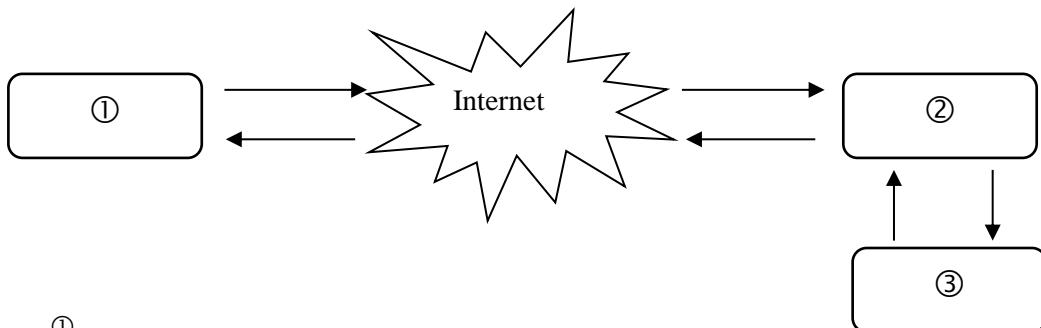
Property :

Value:

(d)

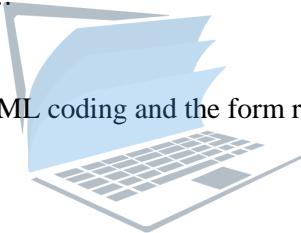
- (i) The following diagram depicts how a PHP script is executed in a computer. Write down the suitable words from selecting in the list given below.

[Web server, Response, PHP interpreter, Request, Client's web browser]



- ①
- ②
- ③

- (ii) Fill the blanks in by considering HTML coding and the form rendered on a web browser given below.



```

<html>
<head>
    <title> Registration </title>
</head>
<body>
    <form action="register.php" method="post">
        <fieldset>
            <legend> Register </legend>
            Full Name: <input type="text" name="name"/>
            <p> Mail Address: <input type="text" name="email"/> </p>
            User Name: <input type="text" name="uname"/>
            <p> Password: <input type="password" name="pwd"/> </p>
            <input type="submit" name="Submit" value="Submit"/>
            <input type="button" name="Cancel" value="Cancel"/>
        </fieldset>
    </form>
</body>
  
```

இப்பகுதியில் என்ன எத்தனை எழுதலாகாது

4.

- (a)** In software development, compare and contrast waterfall model and agile process model (two comparisons are enough).

Waterfall model	Agile process model

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(b)

- (i)** Steps for the boot sequence of a computer is given below. Arrange them in order.

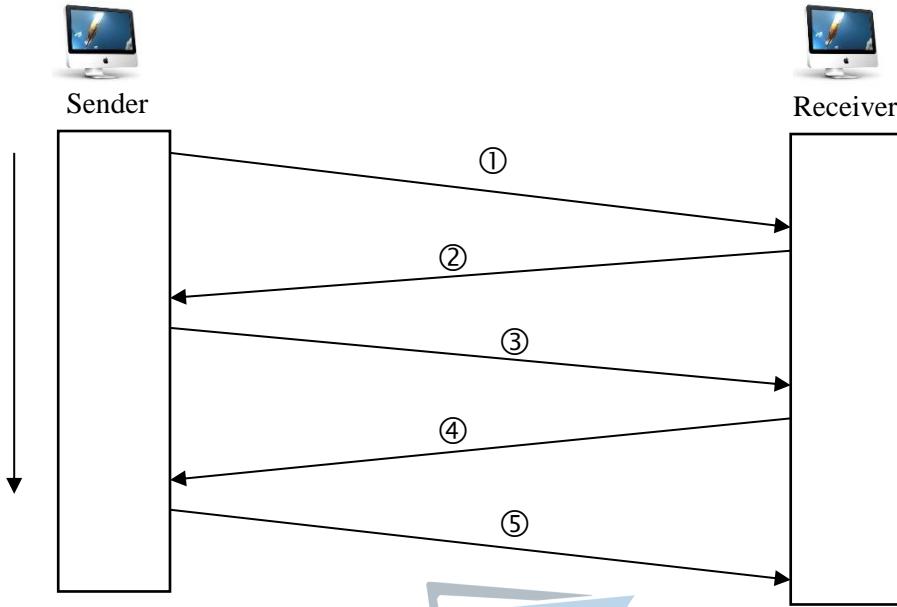
[CPU, POST, Power good, Boot Loader, Operating System]

- | | |
|---------|---------|
| ① | ② |
| ③ | ④ |
| ⑤ | |

- (ii)** In a seven-states process transition diagram of an operating system, write down the next states of ready state.

.....
.....

- (c) The following diagram depicts how transmission control protocol (TCP) is shown the connection establishing in three ways.



Write down the words for the numbers from the list given below.

[Establishing connection, ACK, SYN, data transfer, SYN /ACK]

- ① ②
- ③ ④
- ⑤ ⑥

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(d)

- (i) Using of the following Pseudocode, fill the blanks in the values of Num1 and Num2 in the execution in the table given below. Their first values are 15 and 39 respectively.

```

num1 ← USERINPUT
num2 ← USERINPUT
WHILE num1 ≠ num2
    IF num1 > num2 THEN
        num1 ← num1 - num2
    ELSE
        num2 ← num2 - num1
    ENDIF
ENDWHILE
  
```

Num1	Num2
15	39

G.C.E. (A/L) Examination – June 2019
Conducted by Field Work Center, Thondaimanaru.
In Collaboration with Northern Provincial Education
Department
Information & Communication Technology (ICT)



Gr. 13 (A/L) 2019

Essay Questions

Part – II B

Answer any four questions only

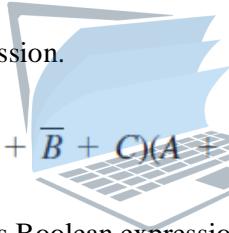
01.

(a) A half-adder accepts two inputs A and B and gives outputs such as sum and carry.

- (i) Give a truth table to obtain sum and carry.
- (ii) Obtain simplified output for sum and draw logic circuit for it.

(b) Consider the following Boolean expression.

$$(A + B + C)(A + B + \bar{C})(A + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + \bar{B} + C)$$



- (i) Give a Karnaugh map to represent this Boolean expression.
- (ii) Simplify the Boolean expression given by using Karnaugh map.
- (iii) Convert this Boolean expression to SOP (Sum of Product) form.
- (iv) By using the same Karnaugh map, simplify the Boolean expression obtained in (iii).
- (v) What do you say about the results obtained in (ii) and (iv)?

02. Consider the following scenario.

The largest supermarket company in Sri Lanka is holding 500 branches across the country. In the branches, large number of customers are able to purchase the goods daily. Each branch purchases goods from the purchasing group of this company every day and sent to the branches. These are purchased by the purchasing group of this company in Colombo. In this case, the purchases received from each of the branches are subject to goods purchase. All these are manually carried out and so the goods are not sent to the proper quantities to the branches. More and more occasionally, some of the goods are likely to be not enough stock in branches. Therefore, it cannot be provided better services to the customers, but also the company's goodwill leads to be damaged.

- (a) Information technology branch of the company gives advices to the management that stocks of goods could be kept properly when a computer based stock control system is implemented in super market branches. Do you agree with this statement? Explain a reason for that.
- (b) Explain how the stocks of goods could be maintained by implementing a monitoring software agent in a computer based stock control system.

- (c) The company intends to provide services of purchasing of goods via online to their customers. Which service is an e-commerce service model for the company's customers? Justify your answer.
- (d) Explain with the help of three examples of what can help customers in implementing a software agent in the e-commerce web site.

03. Consider the following scenario.

An algorithm is used to calculate the amount of fuel a train will need to complete a journey.

- ask the user how many kilometers the journey will be.
- only continue if the user enters a value greater than zero
- set the amount of fuel to a number 100 times greater than the number of kilometers
- not allow the amount of fuel to be less than 1500
- finally, display the amount of fuel needed

- (a) State all the inputs and outputs for this purpose.
(b) Draw flowchart algorithm for that.
(c) Write down Python program to implement this flowchart.

04.

(a) Compare network and transport layers of OSI network reference models (two comparisons are enough)

(b) A class C network 200.138.1.0 is sub-netted with a subnet mask of 255.255.255.252

- (i) Estimate the number of networks available
- (ii) Estimate the number of hosts that can be assigned for each network
- (iii) Write down the usable address range for first three networks
- (iv) Identify the broadcast address of first three networks

(c) A small scale business organization having 80 clients requires a stable Internet connectivity for their basic web browsing requirements as well as for video conferencing and voice applications.

- (i) If the ISP has given a public IP what technologies or servers can be used to distribute the internet services to all the computers of the company?
- (ii) Explain a technology which you can utilize to limit the broadcast domain to less than 25 computers in the above company network.
- (iii) If one is required to provide web and mail in-house hosting facility to users, list computer network connectivity devices needed.
- (iv) Draw a computer network diagram consisting of all the requirements given above. Show all the devices clearly.

05.

(a) The following segment of a webpage for collecting of persons' particulars is given below.

The screenshot shows a web browser window with the title bar 'Registration'. Below it is a search bar with the placeholder 'Search Google or type a URL'. The main content area contains a form titled 'Personal information:'. It includes fields for 'First name:', 'Last name:', and 'Contact number:'. Under 'Gender', there are three radio buttons: 'Male' (selected), 'Female', and 'Other'. A dropdown menu for 'Place' lists 'Jaffna' (selected), 'Colombo', 'Kandy', and 'Galle'. At the bottom are 'Submit' and 'Reset' buttons.

(i) Write down HTML code fully to create this webpage.

[Place should be Jaffna, Colombo, Kandy and Galle]

(ii) Assume that while all the details are entered onto this form and submit button is clicked, those details are sent to "register.php" file. Write down PHP code segment to implement it.

06. Consider the following scenario.

A library service wants to create a database to store details of its libraries, books and borrowers.

Details include the following:

A book has a unique ISBN number, a title and one or more authors. The library service may owe several copies of a given book, each of which is located in one of the service's libraries. A given library contains many books, and in order to distinguish different copies of the same book a library assigns a different copy number to each of its copies of a given book. The price that was paid for each copy is also recorded. Every library has a unique name and is either a main library or a branch library. A main library may have zero or more branch libraries and every branch library is a branch of exactly one main library. A borrower has a name and a unique code. A borrower can have many books on loan, but each copy of a book can only be on loan to one borrower. A borrower could borrow the same book on several occasions, but it is assumed that each such loan will take place on a different date.

Draw EER diagram for this scenario. State any assumptions you made.
