G.C.E. (A/L) Examination – March 2017
Conducted by Field Work Center, Thondaimanaru.
In Collaboration with the Zonal Education Office, Jaffna

Information & Communication Technology (ICT)

Grade 13 (A/L) 2017   **Part - I**   **Time : 2 hours**
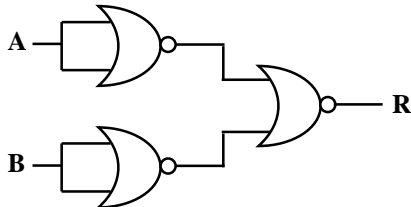
Answer all the questions

1. Which of the following statement is correct?
- *(1)* Blaise Pascal designed analytical engine
- *(2)* Adding machine was designed by Von Neumann
- *(3)* Punched card was designed by Blaise Pascal
- *(4)* Difference engine was designed by Blaise Pascal
- *(5)* Alan Turing is considered as the father of computer science

2. Two's complements of $(+9_{10})$ and (-6_{10}) are respectively.
- *(1)* 00001000_2 , 00010011_2
- *(2)* 00001001_2 , 11111010_2
- *(3)* 11100111_2 , 00010011_2
- *(4)* 11110111_2 , 10010011_2
- *(5)* 11110111_2 , 00010011_2

3. Consider the following statements.
- A – allowing the execution of applications even not in main memory fully
- B – larger than physical memory
- C – its capacity is limited

Which of the above statement(s) is/are correct about virtual memory?
- *(1)* A only
- *(2)* B only
- *(3)* C only
- *(4)* A,C only
- *(5)* A,B,C all

4. The simplified result of the Boolean function $f(x, y, z) = x\bar{y}z + \bar{x}\bar{y}z + xyz$ is.
- *(1)* xy
- *(2)* yz
- *(3)* $\bar{x}y$
- *(4)* $\bar{y}z$
- *(5)* $z(x + \bar{y})$

5. Consider the following statements.
- A – allocating and resolving of memory required by processes
- B – providing security for computer
- C – handling files and folders

Which of the above is/are function(s) of file management in an operating system?
- *(1)* A only
- *(2)* B only
- *(3)* A,B only
- *(4)* A,C only
- *(5)* A,B,C all

6. In an automated teller machine (ATM), customers are expected to enter four digits number compulsorily. Which of the following data validation method(s) is/are most appropriate?
- A – format check
- B – range check
- C – type check
- D – length check
- E – numeric check
- *(1)* A,B only
- *(2)* B,C only
- *(3)* C,D,E only
- *(4)* A,C only
- *(5)* B,C,E only

7. Which of the following is a component of a CPU?
- (1) L3 cache memory
- (2) CU
- (3) power supply
- (4) RAM
- (5) ROM

8. Which of the following statement is incorrect about UDP (User Datagram Protocol)?

 (1) connection-oriented

 (2) unreliable service

 (3) unordered delivery of data packets

 (4) it works on transport layer

 (5) connectionless

9. Consider the following logic circuit.

What is the result of R?

 (1) $A.B$

 (2) $A + B$

 (3) $\overline{A.B}$

 (4) $A.\bar{B}$

 (5) $\bar{A}.\bar{B}$

10. In a computer architecture, "……………………………. is an event that alters the regular execution flow of instructions". The most appropriate word to fill the blank in is.

 (1) program counter   *(2)* ALU   *(3)* RAM

 (4) interrupt   *(5)* cache memory

11. In an operating system, "……………………..maps virtual memory addresses into physical memory addresses".

 The most appropriate word to fill the blank in is.

 (1) page table   *(2)* virtual memory   *(3)* physical memory

 (4) swapping   *(5)* process control block

12. Which of the following uses optical technology to read the contents?

 (1) Floppy disk   *(2)* hard disk   *(3)* magnetic tape

 (4) DVD   *(5)* Flash memory

13. "……………………….decides which of the ready process is to be executed (allocated a CPU)".

 (1) short-term scheduler   *(2)* long-term scheduler

 (3) mid-term scheduler   *(4)* process

 (5) swapping

14. In an operating system, process control block (PCB) consists of.

 A - process state

 B - program counter

 C - I/O status information

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

15. $76_8 + AC_{16} =$

 (1) $A9_{16}$ *(2)* $B9_{16}$ *(3)* $E9_{16}$ *(4)* $C9_{16}$ *(5)* $9E_{16}$

16. The function of a DNS server.

 (1) mapping domain name into IP address

 (2) resolving IP addresses dynamically

 (3) securing computer from malware

 (4) sharing Internet connection among computers

 (5) providing various applications to other devices

17. Which of the following python program is syntactically correct?

    (1) for X in range(1,5)   *(2)* for X in range(1,5):   *(3)* for X in range(1,5)
        print X   print X   print X

    (4) for X in range(1,5):   *(5)* for X in range(1,5):
       print X: print X

18. Consider the following about dynamic random access memory (DRAM).
    A – DRAM requires refreshing
    B – This is used as cache memory
    C – Registers are made of DRAM
    Which of the above is/are correct?
    (1) A only   *(2)* B only   *(3)* A,B only   *(4)* A,C only   *(5)* B,C only

19. Consider the following statements.
    A – cache memory saves the frequently used instructions
    B – control unit controls information flow and instruct computer how to execute instructions
    C – registers keep instructions used by central processing unit
    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

20. "Random access memory (RAM) modules are often compared by their capacity, measures in .... and by their speed, measured in ....".
    Most suitable words to fill the blanks of the above statements are respectively.
    (1) Kilobytes, Gigabytes   *(2)* Gigabytes, Megabits per second
    (3) Gigabytes, Megahertz   *(4)* Megahertz, Kilohertz
    (5) Gigabits, Megabits per second

21. The process in which the newly developed system is ensured that the user requirements are satisfied, is called.
    (1) system design   *(2)* system maintenance   *(3)* system analysis
    (4) system testing   *(5)* coding

22. Consider the following systems:
    A – human blood circulatory system   B – human digestive system   C – human nervous system
    Which of the above could be considered as closed system(s)?
    (1) A only   *(2)* B only   *(3)* C only   *(4)* A,B only   *(5)* A,C only

23. Consider the following statements about information system.
    A – an information system could be used to achieve goals designed of an organization
    B – an information system could be a computerized or manual
    C – a banking system may be an example for an information system
    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

24. Consider the following memories.
    A - Read Only Memory   B - Register   C - Cache memory
    D - Flash memory   E - Random Access Memory
    Which of the above may be considered as non-volatile memories?
    (1) A,B only   *(2)* A,C only   *(3)* A,D only   *(4)* C,E only   *(5)* D,E only

25. Which of the following HTML tag is used to create ordered list?

(1) <CAPTION> (2) <UL> (3) <TABLE> (4) <H1> (5) <OL>

26. In data communication, "…………….. is used to transmit the received signal into higher power".

(1) router (2) modem (3) multiplexer (4) hub (5) repeater

27. Consider the following statements.

A – L1 cache memory is more speed than L2 cache memory
B – L1 cache memory is less speed than L2 cache memory
C – L1 cache memory is more capacity than L2 cache memory
Which of the above is/are correct?

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

28. Which of the following is a class C IP address?

(1) 191.1.1.10 (2) 224.5.6.4 (3) 121.8.7.5 (4) 223.4.3.10 (5) 192.5.1.9

29. The IP address of a computer network is 192.168.2.10. If its subnet mask is 255.255.255.192, how many maximum of hosts can be connected in a network?

(1) 64 (2) 62 (3) 32 (4) 128 (5) 256

30. "………………….. is a computer system that is situated in an environment, and that is capable of autonomous action in this environment on behalf of its user in order to meet its design objectives.".

(1) network (2) application software (3) system software
(4) software agent (5) open source software

31. The value of python statement 5 // 2 is.

(1) 2.5 (2) 3 (3) 2 (4) 32 (5) 25

32. Consider the following statements about e-marketing.

A - more speed B - ease and efficiency C - broader selection of customers
Which of the above is/are the benefit(s) of e-marketing?

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

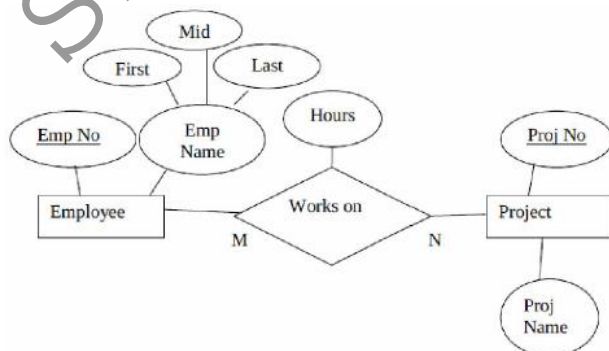**33.** Consider the following statements about foreign key in a relational database.

A - In a relationship between two tables, primary key and foreign key may have different field names.
B - In a relationship between two tables, primary key values in a table can have same values with foreign key in another table.
C - Foreign key is used to create a relationship between two tables
Which of the above is/are correct?

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

34. Consider the following ER diagram between Employee and Project.

When this ER diagram is mapped into tables, which of the following table(s) are available?
   A - Employee (EmpNo, First, Mid, Last)
   B - Project (ProjNo, ProjName)
   C - Works_On (EmpNo, ProjNo,Hours)
   D - Works_On (Hours)

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

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

```
for  a in range(0,5):
   a=a+1
   print (a, end= '  ')
```

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

36. Which of the following python program best defines a user-defined function?

   (1) def function():   *(2)* def function   *(3)* def function()
      print ('Good')   print ('Good')   print ('Good')

   (4) def function():   *(5)* def function
    print ('Good')   print ('Good'):

37. Consider the following HTML code segment.

```
<ol>
  <li> Coffee </li>
  <li> Tea </li>
  <li> <b> Milk </b> </li>
</ol>
```

   Which of the following result is rendered on web browser by this code?

(1)	*(2)*	*(3)*	*(4)*	*(5)*
Coffee	• Coffee	• Coffee	1. Coffee	i. Coffee
Tea	• *Tea*	• Tea	2. *Tea*	ii. Tea
Milk	• **Milk**	• Milk	3. **Milk**	iii. Milk

38. Consider the following statements.
   A – Guido Van Rossum created python interpreter
   B – python programs are based on case sensitivity
   C – it is a third generation computer programming language
   Which of the above is/are correct about python programming language?
   (1) A,B only   *(2)* A,C only   *(3)* B,C only   *(4)* A,D only   *(5)* A,B,C only

39. Consider the following statements about HTML tags.
   A - <div> defines division or section
   B - <p> defines paragraph
   C -
 inserts single line break
   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

40. "Operating system retrieves data from secondary storage in same-size blocks". This is called………………..
Which of the following is correct to fill the blank in?

(1) processing   (2) swapping   (3) context switching   (4) scheduling   (5) paging

41. Which of the following CSS definition is correct?

(1) font: "Times New Roman";   (2) family: "Times New Roman";

(3) font-family: "Times New Roman";   (4) font-type: "Times New Roman";

(5) font-category: "Times New Roman";

42. Which of the following will be used to define an external CSS?

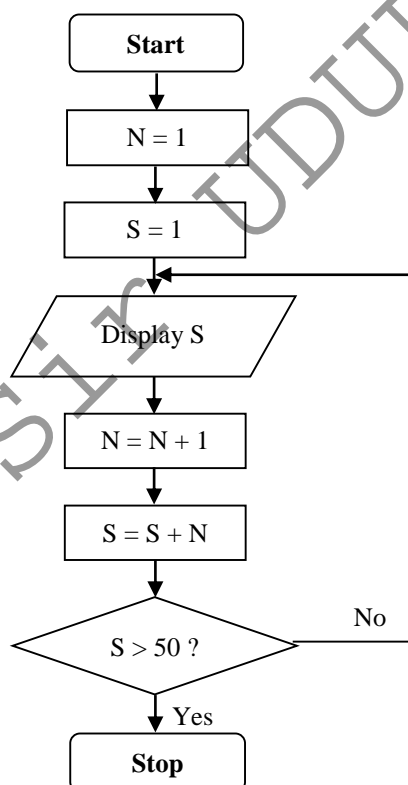(1) < link rel="stylesheet" type="text/css" href="mystyle.css" >

(2) < link src="stylesheet" type="text/css" href="mystyle.css" >

(3) < link link="stylesheet" type="text/css" href="mystyle.css" >

(4) < link a="stylesheet" type="text/css" href="mystyle.css" >

(5) < link img="stylesheet" type="text/css" href="mystyle.css" >

43. "……………………. was created to overcome the problem of collisions that occur when packets are transmitted simultaneously from different computers".

(1) IP   (2) CSMA/CD   (3) TCP   (4) FTP   (5) UDP

44. Which of the following best describes the non-functional requirement of a cellular phone?

(1) sending a short message

(2) receiving a telephone call

(3) selecting a telephone number from the contact list

(4) making a telephone call

(5) battery has one year warranty period

45. Consider the following flowchart.

What are first three numbers displayed by this flowchart?

(1) 1, 4, 9

(2) 1, 3, 6

(3) 1, 3, 5

(4) 2, 4, 6

(5) 2, 3, 5

46. Consider the following statements about expert systems.

A - it reveals the decision making ability of human experts

B - it provides the solutions for complex problems by reasoning logically

C - it replaces human experts

Which of the above is/are correct?

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

47. In OSI network reference model, FTP is described in.

(1) physical layer (2) application layer (3) network layer

(4) datalink alyer (5) transport layer

48. Which of the following is/are private IP address(es)?

A - 10.1.1.1 B - 172.32.5.2 C - 172.16.4.4

D - 192.168.5.5 E - 224.6.6.6

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

49. Which of the following statement about a relation in relational model is correct?

(1) Each relation in a database will consists a primary key

(2) Each relation in a database will consists a foreign key

(3) Order of rows are compulsory

(4) Order of columns are compulsory

(5) Each value in an intersection of row and column should have a single value

50. Consider the following tasks.

A – creating a table

B – removing a row from a table

C – changing data in a column from a table

D – removing database

Which of the following SQL keywords are used to do the tasks given above respectively?

(1) alter, create, delete, update

(2) alter, create, insert, delete

(3) update, create, delete, drop

(4) create, delete, update, drop

(5) update, create, insert, drop

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Information & Communication Technology (ICT)

| Grade 13 (A/L) 2017 | Part – II A | Time : 3 hours |

Structured questions   **Answer all the questions**

01.

(a) Write down three media used in secondary storage devices with the help of appropriate example.

(b) Calculate the value of $(+8_{10}) + (-6_{10})$ using 2's complement 8-bits method.

.

(c) A computer system contains a byte addressable memory and it uses 32-bits addresses. What is the maximum usable size of this memory in Giga Bytes? Show your work clearly.

02.

(a) The following table consists of layers in OSI network reference model, their protocols, devices and functions. Indicate (√) in suitable places in the table.

		Physical layer	Application layer	Transport layer	Network layer
(1)	e-mail service				
(2)	Routing				
(3)	TCP				
(4)	IP				
(5)	UDP				
(6)	Communication media				

(b) Differentiate the communication protocols such as TCP and UDP based on connection-oriented.

(c) Consider the following definition list rendered by a web browser.

Singapore
    The land of dreams
Thailand
    The land of smiles

Complete the following HTML code segment to render the list given above.

```
<dl>
    <………> Singapore <……….>
    <……….> The land of dreams <………>
    <………….> Thailand <……….>
    <………> The land of smiles <……….>
</dl>
```

03.

(a) Write down the following CSS definitions whether it is syntactically correct or incorrect. If the rule is incorrect, write down correct rules.

(i) h1 { font-type:arial; }

(ii) p { text-color : red ; }

(b) Consider the following python program.

```
s=0
n=1
while n<=5:
    s=s+n
    print (s,end=' ')
    n=n+1
```
What is the output of this program?

(c) How do you modify this program to obtain sum of first 10 odd numbers?

04.

Consider the following three tables used in a school database.

Student

stdid	name	address
S01	Perera	Galle
S02	Vimal	Galle
S03	Ameen	Colombo
S04	Jamuna	Jaffna

Subject

subid	name
SU01	Mathematics
SU02	Physics
SU03	ICT

Result

stdid	subid	marks
S01	SU01	79
S01	SU03	80
S02	SU01	90
S03	SU02	66

(a) Write down appropriate SQL statement to obtain details such as stdid, and address.

(b) Write down appropriate SQL statement to obtain details such Student Name, Subject Name, and Marks.

(c) Write down appropriate SQL statement to insert first record in Student table.

(d) Write down appropriate SQL statement to create Student table (primary key is stdid).

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Grade 13 (A/L) 2017   **Part – II B**

Essay questions   **Write down answer any four questions only**

01.

(a) State the following Boolean Laws.

    (i) De Morgan's Law

    (ii) Associative Law

(b) A coin is tossed 3 times. A win is said to occur if the result obtained is Heads for at least 2 tosses.
Taking A, B, C as inputs and W as output, given that A, B, C are 1 if the result is
Heads or 0 if the result is Tails; and W is 1 if a win occurs otherwise it is 0.

    (i) Construct a truth table.

    (ii) Write a Boolean expression for W in the form of SOP (sum of product).

    (iii) Simplify the expression obtained in **(ii)** above using Karnaugh map.

    (iv) Draw a combined gate for the simplified expression obtained in **(iii).**

02.

(a) Write down any three functions of transport layer of OSI network reference model.

(b) IP address of a network is *192.168.1.2* and its subnet mask is *255.255.255.224.* How many hosts may be connected in this network?

(c) Write down short notes on the followings.

      (i) DHCP Server

      (ii) Proxy server

(d) Define the term "agent" in the context of agent technology and write down two situations with the help of example where the agent technology is used.

03.

(a) Write down any two programming approaches.

(b) Draw a flowchart to obtain sum of any ten numbers entered by user.

(c) Write down Python program for the flowchart stated above in **(b)**.

04.

Draw an ER diagram to represent the scenario given below. The attributes and the primary keys of entities should be clearly indicated. State clearly if any assumptions that you have.
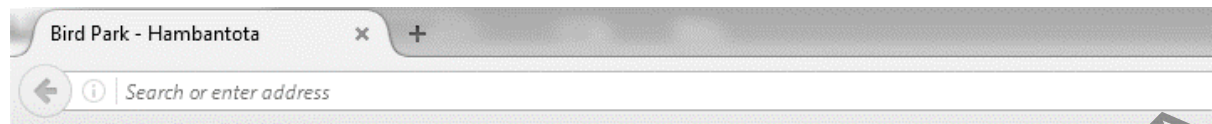
"Jazz Beatle" has decided to store information about musicians who perform on its albums in a database. Each musician has an MID, a name, an address, and a phone number. Each instrument used in songs recorded has a unique identification number, a name (e.g., guitar, synthesizer, flute, etc.) and a musical key (e.g., C, B-flat, etc.).Each album recorded has a unique identification number, a title, a copyright date, a format (e.g., DVD), and an album identification number. Each song recorded has a title and an author. Each musician may play several instruments, and a given instrument may be played by several musicians. Each album has a number of songs on it, but no song may appear on more than one album. Each song is performed by one or more

musicians, and a musician may perform a number of songs. Each album has exactly one musician who acts as its producer. A musician may produce several albums.

05.

(a) What would be the responses by a browser for a <p> tag and for <img> tag in an HTML?

(b) The following web page is a part of the web site of the "Bird Park - Hambantota, Sri Lanka".

Write an HTML code to produce the above web page. Assume that the name of the image file is "bird.jpg". The link, "Bird Park", should link to the site "http://www.birdsibr.com".

06.

"World's Trend" is a mail order supplier of high-quality, fashionable clothing. Customers place orders by telephone, by mailing an order form included with each catalog, or via the Web site.

When customer orders come in, the item master and the customer master files are both updated. If an item is out of stock, the inventory control department is notified. If the order is from a new customer, a new record is created in the customer master file. Picking slips are produced for the customer order and sent to the warehouse. A shipping statement is prepared. The process of shipping a customer order involves getting the goods from the warehouse and matching up the customer shipping statement, getting the correct customer address, and shipping it all to the customer. The customer statement is generated and a billing statement is sent to a customer. An accounts receivable report is sent to the accounting department.

Draw a context diagram to show the overview of the order processing system described above. Clearly indicate external entities and data flows in the diagram.

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