# De Mazenod College Kandana

Information and Communication Technology 20 E (II)Part B

Name:.....................   2nd Term Test   March 2018   Grade 12 3Hours   27·03·2018

Answer all questions

1.

a. Draw data life cycle

b. Draw the abstract model of information

c. Draw the value of information vs time diagram

d. What is the golden rule of information

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e. Define the "System"

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f. Draw two types of system classifications with examples

9.   A space station generates oxygen required for it's astronauts by 'splitting' water (H_2O) into Hydrogen (H_2) and Oxygen(O_2) using electricity supplied by batteries in the space station. This process is given by the following equation.

Water→Hydrogen +Oxygen($2H_2O \rightarrow 2H_2 + O_2$)
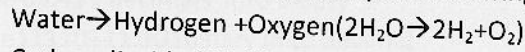
Carbon dioxide (CO_2) breathed out by astronauts and Hydrogen (H_2) generated from the above process are combined together to generate Water and Methane, as given by the following equation.

Hydrogen +Carbon dioxide →Water+ Methane($4H_2 + CO_2 \rightarrow 2H_2O + CH_4$)
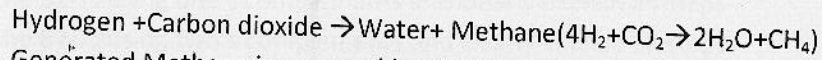
Generated Methane is removed by charcoal filters.

State whether the system described above is open or closed. Give two reasons for your answer.

2.

a.   What is big data and why it consider as a problem?

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b.   What is the reason of generating big data problem?

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c.   What are the solution to overcome big data problem?

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d.   Name 3 websites who generates big data problem

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e.   Draw the life cycle of data processing

f.   What is cloud computing?

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g. What are the three basic service models in cloud computing

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h. Give 2 advantages of cloud computing

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i. Give 2 disadvantages of cloud computing

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j. What are the two types of data gathering techniques? give 2 examples for each

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3.
   a. What is RFID stands for?
   ....

   b. Write 3 applications of RFID
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   ....
   ....

   c. Write 3 common problems of RFID
   ....
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   ....

   d. Write 2 advantages of RFID
   ....
   ....
   ....

   e. How does the barcode reader detect the price in the supermarket?
   ....
   ....

3

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f. Compare 3 differences between barcode reader and the RFID systems

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g. Briefly explain 3 types of validation methods with examples.

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4.

A. Name the following swap diagram(number 1,2,3)
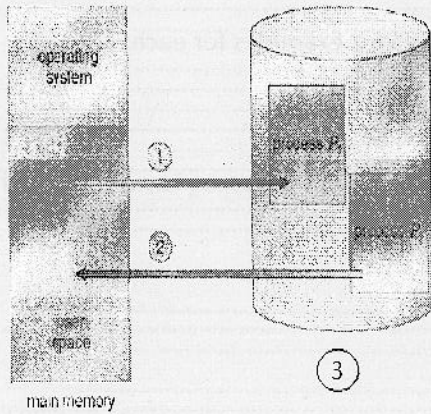
1...........................

2...........................

3...........................

B. Explain what is swapping

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C.   Identify the following diagram and answer the question given

Paging & Mapping
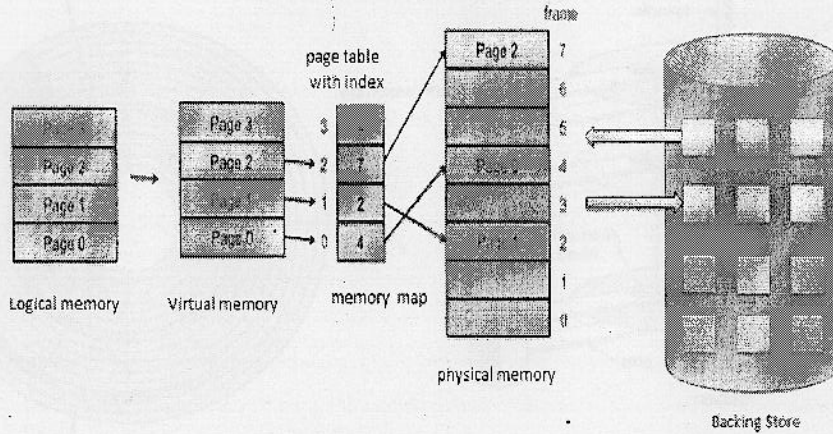
D.   What is page

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....

E.   What is frame

....
....
....

F.   What is mapping

....
....
....

G.   What is the purpose of paging

....
....

H.

   a.   Draw the von-Numann architecture and explain why it consider as basic architecture of
        a computer

b. Name the following labels hard disk drive diagram
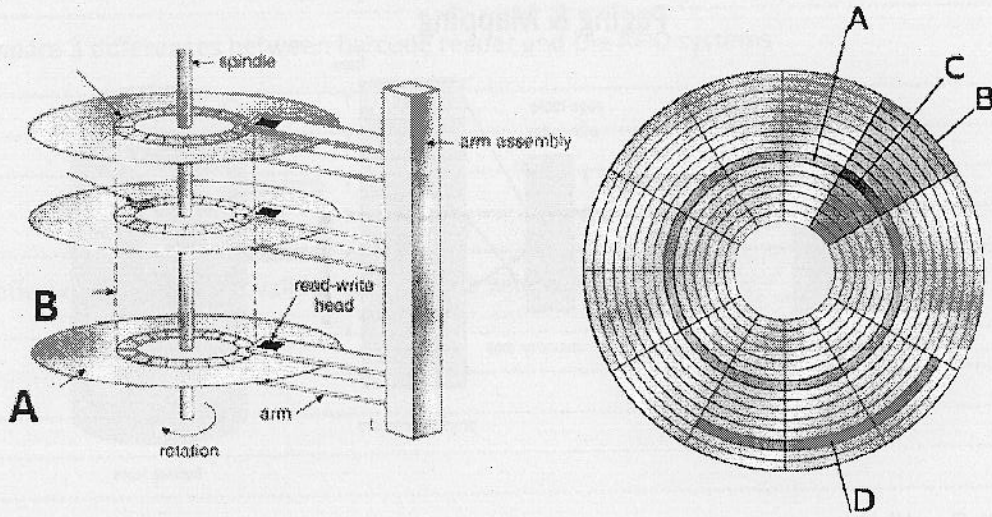
c. Briefly explain how data store in the hard disk

d. Name the following diagram of the CD
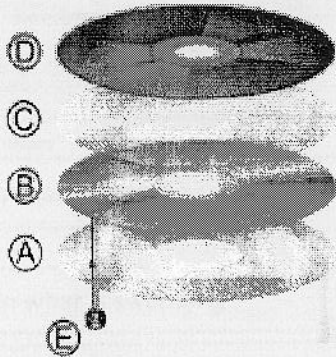
e. Briefly explain how data is stored in the CD

f. Draw the process seven state diagram and briefly explain it

g. Draw the context switching diagram and briefly explain it

h. What is PCB and briefly explain how it is useful in process context switching

Essay

1.

   a. Convert the 65.423 decimals into binary

   b. Convert the 11110111.101 binary in to decimal

   c. Convert the 500.625 decimal to octal

   d. Convert the 125.77 octal into decimals

   e. Calculate the 82-72 using one's complements and clearly explain all steps

   f. Calculate the 82-72 using two's complements and clearly explain all steps

   g. Simplify the following K-maps

CD\AB

1	0	1	1
1	1	1	1
1	1	1	1
0	1	1	1

2.

   a. Convert the DAD.A hexadecimal into decimals

   b. Convert the 1010.1010 binary numbers into hexadecimal

   c. Convert the CAB.BAD hexadecimals into octal

   d. Convert the 462.67 octal in to hexadecimal

   e. Calculate the followings

      i. $BAD_{16}+BED_{16}$

      ii. $CAD_{16}-AC_{16}$

      iii. 77_8+77_8

      iv. 7001_8-7_8

      v. $1010_2 \times 1001_2$

      vi. $10001_2/110_2$

3. An AI ROBOT consist of 4 security lockers such as face recognition security locker (S),Irish matching locker (I),Figure print matching locker (F) and voice password locker(V).When the robot is powered on user should unlock at least 3 lockers out of 4 lockers. Then the AI ROBOT system start functioning (A). locker on and off states detect as 1 and 0

      i. Draw the correct truth table to find out the functioning state (A)of AI ROBOT

      j. Write a Boolean expression to representfunctioning state (A) of AI ROBOT

      k. Simplify using **only Boolean algebraic rules.**

      l. Construct the logic circuit using only NAND gates and one OR gate find out the functioning state (A) of AIROBOT .* Assume that the electricity is always supplied to the ROBOT.

1. Which of the following statements best describes the result of hard disk 'fragmentation'?

(1) Hard disk data access speed is reduced.   (2) Network access speed becomes slow.

(3) Hard disk becomes totally inaccessible.   (4) Some data will get erased from the hard disk.

(5) Number of bad sectors get increased.

2. Consider the following statements about operating systems:

A - Ubuntu is an open source operating system.

B - Windows XP is a proprietary operating system.

C - Linux is a proprietary operating system.

Which of the above statements is/are correct?

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

3. The type of operating system that is most suitable for an automated air traffic control system is

(1) multi-user multi-tasking.   (3) real time.   (5) multi-threading.

(2) single-user multi-tasking.   (4) single-user single-tasking

4. Sharing a single microprocessor among number of application programs using context switching is known as

(1) Multi-user processing.   (2) Multitasking.   (3) Multiprocessing.
(4) Batch processing.   (5) Online processing.

5. The generation of monthly salary slips of employees in an organization is an example for

(1) Batch processing.   (2) Real time processing.   (3) Online processing.

(4) Transaction processing.   (5) Interactive processing.

6. Consider the following systems
   A-Human blood circulatory system
   B-Human digestive system
   C-Human nervous system
   The system(s) that can be considered as open system(s) is/are
   (1) A only   (2) B only   (3) C only   (4) A and B only   (5) A and C only

7. Which of the following is **not** a typical use of the Random Access Memory(RAM) of a personal computer?

(1) Keeping data for processing.   (2) Holding instructions for operations.

(3) Providing storage for operating system.   (4) Retaining information for output.

(5) Keeping the BIOS program for boot-up.

8. Consider the following terms related to computer systems:

A - Malware   B – Hardware   C - Software   D – Live ware

     Which of the above are basic components of a computer system?

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

9. In an operating system, suspending the current executing process and then resuming or restarting another process is termed as,
   1)Pagging   2)Context switching   3)Swapping   4)Interrupting   5)Blocking

10. In modern operating systems, the .... scheduler determines the transition of processes from the new state to the ready state,

Which of the followings is the correct term to fill the blank in the above statement?

1)mid –term   2)long – term   3)very long –term   4)very short-term   5)short-term

11. Which of the followings is usually used to boot-up personal computers?

1)Firmware   2)Malware   3)Hardware   4)Ransomeware   5)Live ware

12. Which of the following is a main use of Complementary Metal – Oxide Semiconductor (CMOS) memory of a personal computer?

1)Keeping inputs for processing   2)Holding instruction for operations   3)Providing space for loading operating system

4)Relating information for output   5)Keeping basic input Output system stings for the booting procedure.

13. Consider the following combinatory circuit implemented using universal gates:

Input ———   ——— Output
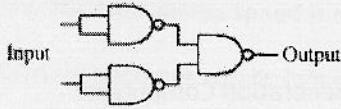
(1)AND Gate   (2)OR Gate   (3)NAND Gate (4)NOR Gate   (5)NOT Gate

14. Consider the following logic circuit implemented using universal gates:
    The above circuit is equivalent to a/an
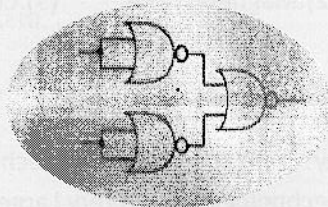
    (1)NOT Gate   (2)AND Gate   (3)OR Gate   (4)NAND Gate   (5)NOR Gate

15. Consider the following circuit with four push button switch namely:S1,S2,S3,and S4. These four switches can either be in pushed or released states which are represented by 1 and 0 respectively.(Note: In the circuit given below ,all the switches are in released states having value 0)
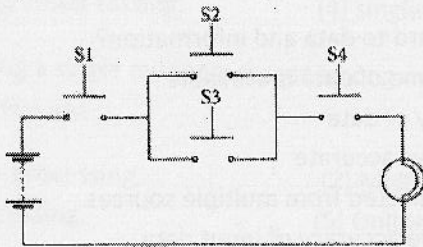
Which of the following Boolean expressions represents the function of the bulb, if the on state of the bulb is represented by the value 1?

(1) S1 + (S2 . S3) + S4   (2) (S1 + S2) . (S3 + S4)   (3) (S1 . S2) + (S3 . S4)
(4) S1 . S4 . (S2 + S3)   (5) S2 + (S1 . S4) + S3

16. F=z(y+z)(x+y+z) is equal to

                (1)z   (2)y   (3)x   (4)yx   (5)xz

17. (xy)'(x'+y)(y+y') is equal to
        (1)x   (2)y   (3)x'   (4)y'   (5)xy

18. Who is considered as the first computer programmer?
    (1) John Von Neumann   (2) Blaise Pascal   (3) Charles Babbage
    (4) Ada Augesta Lovelace   (5) John Presper Eckert

19. Which of the following technologies has been used in the Third Generation Computers?
    (1) Integrated Circuits(ICs)   (2) Large Scale Integration(LSI)   (3) Micro Processors
    (4)Transistors   (5) Vaccum Tubes

20. "The data in ....is read by using the Laser technology" Which of the following is most appropriate to fill the blank in the above statement?
    (1).Floppy Disk   (2).Magnetic Tape   (3).Compact Disk   (4).Magnetic Hard Disk
    (5)Flash Memory

21. Babbag's Difference Engine is based on ....
    (1)Mechanical Technology   (2)Vacuum tube technology   (3)Transistor technology
    (4)Integrated Circuit(IC) technology   (5)Very Large Scale Integrated(VLSI) Circuit technology.

22. Which of the following components is located outside the microprocessor?
    (1)Arithmetic and Logic Unit(ALU)   (2)RAM   (3)Control Unit   (4)Registers
    (5)Level 1 cache memory

23. Which of the following statements is true with regard to data and information?
    (1)Decision can be made only when a massive volume of data is available.
    (2)Validity off information depends on the accuracy of data
    (3)Information obtained by processing data is always accurate
    (4) In order to obtain information, data must be collected from multiple sources.
    (5)The accuracy of information depends on only the accuracy of input data.

24. Which of the following statement is correct with respect to openness and closeness of a system?
    (1)An Automatic teller Machine of a bank should be a close system.
    (2)A general purpose computer can be considered as an open system.
    (3) Human blood circulatory system is an open system
    (4)A mobile phone is a close system.
    (5)A solar power generation system is close system

25. Consider the following statements about Firmware:
    A-Firmware is the program required to bootup a computer system.
    B-Firmware is incorporated in washing machines
    C-Firmware can be easily changed later on.
    (1)A only   (2)B only   (3)A and B only   (4)A and C only   (5)B and C only