De Mazenod College Kandana   28-07-2016

Information and Communication Technology 20 E[I]   Grade 12
Name:................   3rd Term Test   July 2016   Class:13 Time: 2 Hours
(New)

Answer all questions   MCQ   Total: 100 marks

1. Which of the following statement is correct with respect to the evolution of computing devices?
   (1) Vacuum tubes were used by Blaise Pascal to build the Pascaline.
   (2) The Pascaline is considered as a first generation computing device.
   (3) Computers built using vacuum tubes are considered as second generation computers.
   (4) Electronic Numerical Integrator and Computer (ENIAC) was built using vacuum tubes.
   (5) Apple I and Apple II are two examples for second generation computers.

2. Which of the following converts digital data to analog data to transmit over an analog telephone network?
   (1) Network interface Card (NIC)
   (2) Modem
   (3) Multiplexer
   (4) Bluetooth adaptor
   (5) Wi-Fi card

3. The Sri Lankan cricket team won the T-20 world cup-2014 tournament. The Sri Lankan cricket fans had the highest value of this information when ....
   (1) The final match started
   (2) Thisara Perera scored the winning run
   (3) The caption Lasith Malinga received the trophy
   (4) They saw the news on the news on the newspapers
   (5) They saw the cricket team at the Katunayaka Airport

4. $4A6_{16}+99_{10}=$
   (1) 615_{16}
   (2) 615_{10}
   (3) 509_{10}
   (4) 509_{16}
   (5) 659_{16}

5. Representation of 5_{10} and -9_{10} in 8-bit Two's complement forms are
   (1) 00 00 01 01 and 11 11 01 11 respectively
   (2) 11 11 01 11 and 11 11 01 11 respectively
   (3) 00 00 01 01 and 10 00 10 01 respectively
   (4) 00 00 01 01 and 11 11 01 10 respectively
   (5) 11 11 10 11 and 11 11 01 10 respectively

6. The decimal number equivalent to the 10111_2 is
   (1) 25_{10}
   (2) 24_{10}
   (3) 23_{10}
   (4) 32_{10}
   (5) 31_{10}

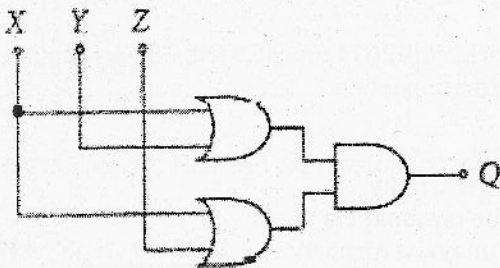7. What is the output of the algorithm represented by this flow chart?

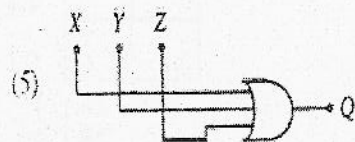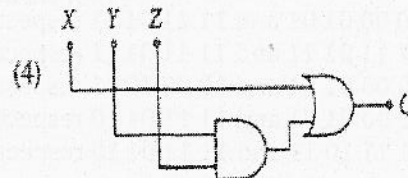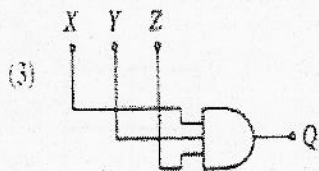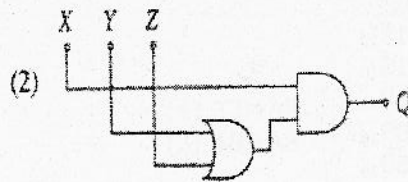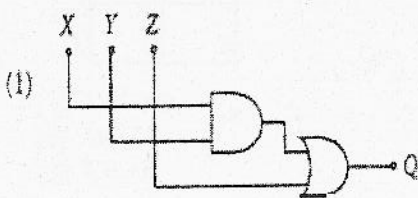   (1) 0   (3) 4   (5) 15

    (2) 5   (4) 10
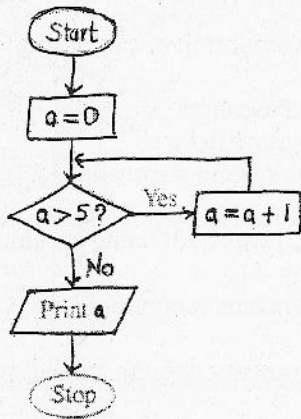
8. Consider the following logic circuit:

Which of the following circuit diagrams represents a simplified version of the above circuit?

2

9. Which of the following is not a main function of an operating system?
   (1) Memory management
   (2) Process Scheduling
   (3) File Handling
   (4) Virus Detection
   (5) User Interfacing

10. In an operating system, moving a process from the main memory to the secondary storage in order to bring in another process to the main memory is called ....
    (1) Demand paging
    (2) Context Switching
    (3) Swapping
    (4) Interrupting
    (5) Scheduling

11. Facebook is a popular social network connecting millions of people with new member s joining daily which of the following statements is most correct?
    (1) Facebook plays a very important role in building and manipulating your family relationship.
    (2) Facebook is the only social network available today.
    (3) Privacy settings of Facebook assure in the privarcy of its users completely.
    (4) Publishing private information in facebook has resulted in unfortunate incidents.
    (5) Real identity of a person is always guaranteed in facebook.

12. Consider the following statements about an automated system:
    A. Human intervention is not required or minimally required
    B. All the operations of the machine are controlled by the micro chip installed in the machine.
    C. A system that processes daily banking transactions can be considered as an automated system.
    (1) A only
    (2) A and B only
    (3) A and C only
    (4) B and C only
    (5) All A,B and C

13. Consider the following statements regarding the requirements of a Bank ATM:
    A. A customer shall be able to inquire his/her bank balance.
    B. A customer should be able to deposit money through ATM.
    C. Maximum withdrawal amount per day is 20,000.
    Which of the above requirement s is/are functional requirement(s) of the ATM?
    (1) A only
    (2) B only
    (3) C only
    (4) A and B only
    (5) A and C only

3

14. Consider the following system:
    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

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

16. Which of the following technologies has been used in the first Generation Computers?
    (1) Integrated Circuits (ICs)
    (2) Large scale integration
    (3) Micro Processor
    (4) Transistors
    (5) Vacuum Tubes

17. Which of the following technologies has been used in the second Generation Computers?
    (1) Integrated Circuits (ICs)
    (2) Large scale integration
    (3) Micro Processor
    (4) Transistors
    (5) Vacuum Tubes

18. Which of the following technologies has been used in the third Generation Computers?
    (1) Integrated Circuits (ICs)
    (2) Large scale integration
    (3) Micro Processor
    (4) Transistors
    (5) Vacuum Tubes

19. "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

20. Consider the following statements about data and information
    A-The symbols '101011101'
    B-Numbers, characters and images
    C-Facts derived from a study
    D-Facts that have been processed in such a way as to be meaningful to the person who receives it.

Which of the above statements best describe/s 'information'?
  - (1) D only
  - (2) A and B only
  - (3) C and D only
  - (4) A,B and C only
  - (5) B ,C and D only

21. An electronic washing machine can be best considered a/an
  - (1) Information System
  - (2) Automated system
  - (3) Expert system
  - (4) Management Support system
  - (5) Transaction processing system

22. $144_8 + 175_8 =$
  - (1) 225_8
  - (2) 341_8
  - (3) 441_8
  - (4) 531_8
  - (5) 314_8

23. The type of operating system that is most suitable for an automated air traffic control system is
  - (1) Multi-user multi -tasking
  - (2) single-user multi -tasking
  - (3) Single-user single- tasking
  - (4) Error detection
  - (5) Non of them

24. What would be the result if the following Boolean expression is simplified?
  $F(x,y)=x'y'(x'+y)(y+y')$

  - (1) x'
  - (2) y'
  - (3) x
  - (4) y
  - (5) xy

25. Consider the following terms:
  A – Input   B – Output   C – Process   D-Storage
  Which of the above are essential for a system?
  - (1) A and B only.
  - (2) A, B and C only.
  - (3) A, C and D only.
  - (4) B , C and D only.
  - (5) All A, B, C and D

26. The main advantage of creating more than one partition is a hard disk is the
  - (1) Separation of the operating system and program files.
  - (2) Ability to retrieve files efficiently.
  - (3) Easiness of making directories and subdirectories.
  - (4) Easiness of creating multiple users.
  - (5) Easiness of taking backups of selected files.

27. Which of the following Boolean expressions represents the output of the given logic circuit?

(1) $\overline{(A+B)} + \overline{(B \cdot C)}$

(2) $\overline{(A+B)} \cdot \overline{(B \cdot C)}$

(3) $\overline{(A+B)+(B \cdot C)}$

(4) $\overline{(A \cdot B)} + \overline{(B \cdot C)}$

(5) $\overline{(A \cdot B)+(B+C)}$
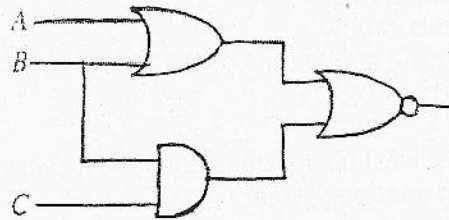
28. "Video conferencing is best described as a/an ....discussion through .... between two or more individuals in different locations".
Which of the following is the most appropriate answer to fill the blanks in the above statement?
    (1) Video, TV
    (2) Audio, telephone
    (3) Audio, network
    (4) Audio visual, TV
    (5) Audio visual, network

29. What will be the output when the following python code is executed?
    Print("Information and Communication")
    (1) Information and Communication
    (2) ("Information and Communication")
    (3) "Information and Communication"
    (4) Error
    (5) Print("Information and Communication")

30. Which of the following "Python" statement is acceptable?

    A -   a. b = 2+5, 2*5
    B -   X, Y = Y, X
    C -   X, Y = 5, 'Saman'

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

31. What will be the output when the following python code is executed?
    2*3+2
    (1) 10
    (2) 32
    (3) Error
    (4) 8
    (5) 2*3+2

32. Which of the following statements about the algorithm represented by this flow chart is correct if the user inputs the value 6?
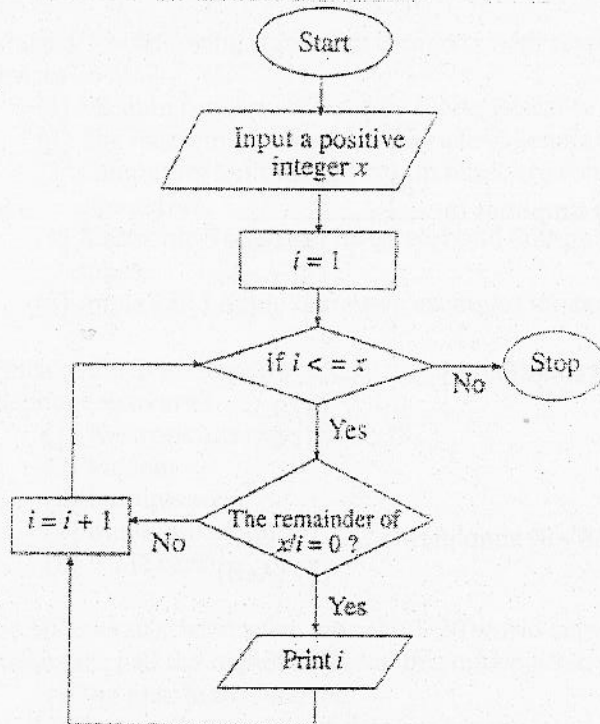
(1) It stops when the value of I is equal to 6.
(2) It prints the value 4 as one of its outputs.
(3) It prints the value 2 as one of its outputs.
(4) It prints all the integers from 1 to 6.
(5) It prints all the integers from 1 to 5.

33. What will be the output when the following python code is executed?

    2**6+\8

    (1) 72
    (2) Error
    (3) 20
    (4) 64+\8
    (5) 8

34. What will be the output when the following python code is executed?
    5**3-90
    (1) 90
    (2) 75
    (3) -75
    (4) -35
    (5) 35

35. What will be the output when the following python code is executed?

```
1**2+2**1+3**1
```

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

36. The Boolean expression $(x+y).(x+z)$ simplifies to ....

    (1) x   (4) x+yz
    (2) x(y+z)   (5) x+y+z
    (3) xyz

37. The Boolean expression $(A+A')+(A')'$ simplifies to ....

    (1) A   (4) 1
    (2) A'   (5) 0
    (3) A+A'

38. The Boolean expression $(A+B')B+(AB'+B)$ simplifies to ....

    (1) A   (5) (A+B)'
    (2) AB
    (3) (AB)'
    (4) A+B

39. Find the correct Boolean expression for following KMaps

A \ B	0	1
0	1	0
1	0	1

    (1) A'B'+AB   (4) A'B+AB
    (2) AB+AB   (5) AB'+AB
    (3) A'B'+B

40. Find the correct Boolean expression for following KMaps

AB \ C	0	1
0,0	0	0
0,1	1	0
1,1	1	0
1,0	0	0

    (1) AB   (4) A'C
    (2) BC'   (5) A'B
    (3) B'C

41. Find the correct Boolean expression for the following KMaps

AB \ CD	0,0	0,1	1,1	1,0
0,0	1	0	0	1
0,1	0	1	1	0
1,1	0	1	1	0
1,0	1	0	0	1

(1) BD+AC
(2) B'D'+D
(3) B'D'+BD

(4) BD+AD
(5) BD+B

42. Find the correct Boolean expression for the following KMaps

AB \ CD	0,0	0,1	1,1	1,0
0,0	1	0	0	1
0,1	0	1	0	0
1,1	0	1	1	0
1,0	1	0	0	1

(1) B'D'+BD(C'+A)
(2) B'D+BC'D+ABD
(3) B'D'+BCD+ABD
(4) B'D'+BD(C+A)
(5) B'D'+BD(C'+A')

43. The hexadecimal number equivalent to the 10111.0110_2 is

   A. 177.6_{16} C. 17.16_{16} E. 17.01_{16}
   B. 17.06_{16} D. 17.60_{16}

44. $1101.1010_2 + 111.010_2$ is equal to binary

   A. 10101.11100_2
   B. 100100.1110_2
   C. 10100.1110_2
   D. 101100.11100_2
   E. 101010.1110_2

45. $123.25_8 + 56.25_8$ is equal to octal

   A. 301.52_8 C. 205.52_8 E. 301.52_8
   B. 201.52_8 D. 301.52_8

46. Meaning of software piracy is ......

   (1) Stealing of software at home.
   (2) Coping software.
   (3) Stealing of software from manufacturing company.
   (4) Coping from purchased software.
   (5) Making of illegal copies of software on which the user has no copy right.

47. Consider the following terms.

     A - Waterfall
     B - Spiral
     C - Structured
     D - Unified development
     E - Object oriented

Which of the above represents the system development model?

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

48. The first generation computer were based on

    (1) Very Large Integration (VLSI)Technology
    (2) Large Scale Integration (LSI) Technology
    (3) Integrated Circuits (ICs)
    (4) Transistor
    (5) Vacuum tubes

49.

    (-78) in 2's complement,

    (1) $0100\ 1110_2$
    (2) $0100\ 1111_2$
    (3) $1011\ 0001_2$
    (4) $1011\ 0010_2$
    (5) $1001\ 0010_2$

50.

Consider the following Karnaugh map.
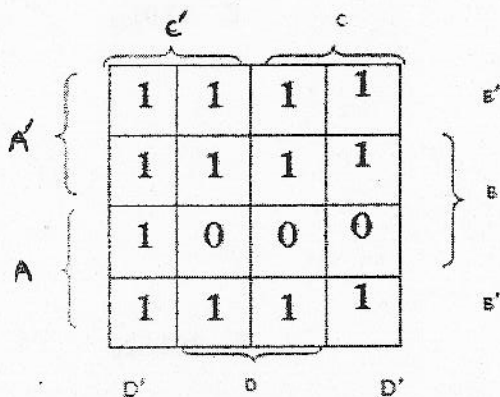
Which is the correct logic expression when you simplify it using given values.

    (1) A' + AB' + C'D'
    (2) A' + B' + AD'C'
    (3) A' + B' + C'D'
    (4) C'D' + A'C' + A'C' + B'
    (5) B'C + B'C' + A'C + C'D

De Mazenod College Kandana

Information and Communication Technology 20 E[II] Structured

Name:................... 3ʳᵈ Term Test   2016   Class:13 (New) Time: 1 Hour

Part A

Answer all 4 questions. Each question contains 25 marks

1.

A. Write python program for given output.   (15 marks)
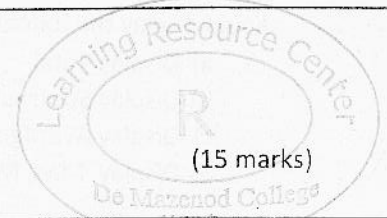
	Output	Python program code
1	>>> 0 1 2 3 4 >>>	
2.	[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]	
3.	[500, 550, 600, 650, 700, 750]	
4.	[0, 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99]	
5.	0 9 18 27 36 45 54 63 72 81 90 99 >>>	
6	[90, 189, 288, 387, 486, 585, 684, 783, 882, 981]	

1

B. Write a python program to input any two numbers (Num1 and Num2) and work as calculator, It should display the following outputs (10 marks)
a) Display Total
b) Display Subtract
c) Display Average
d) Display Max, Min

2.

A. Write the output of the following logic circuit
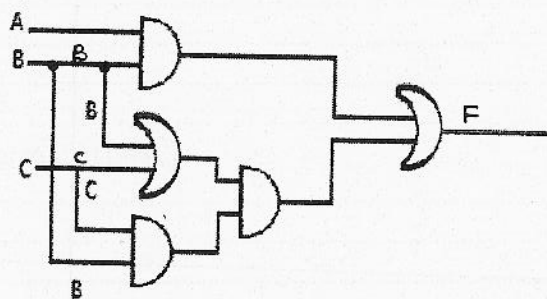
B. Simplify the output using Boolean algebraic laws

C. Draw the truth table for the simplified output

D. Consider the output of 1 and write the SOP for the output.

....

E. Consider the output of 0 and write the POS for the output.

....

F. Represent the SOP output in K-MAP

G. Convert the following SOP in to POS using Demorganc Law

    a) AB+BC

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

    b) A'B'C+AB

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

3.

A.

a) Convert the (43_{10}) number in to 8 bit binary

....

....

b) Convert (46_{10}) number in to 8 bit binary

....

....

c) Find the 1's complement of (43_{10})

....

....

....

....

....

d) Find the 1's complement of (-46_{10})

....

....

....

....

e) Find $(43_{10})+ (-46_{10})$ using 1's complement methods.

....

....

....

....

B.

a) Find the 2's complement of (43_{10})

....

....

....

....

b) Find the 2's complement of (-46_{10})

....

....

....

....

c) Find $(43_{10})+ (-46_{10})$ using 2's complement methods.

....

....

....

....

De Mazenod College Kandana

Information and Communication Technology 20 E[II] Essay

Name:..................... 3rd Term Test   2016   Class:13 (New) Time: 2 Hour

Answer any 4 questions   Part B
Each question contains 25 marks

1.

  A. Simplify the following k-map write your answer in SOP

1)

A\B	0	1
0	1	0
1	0	1

2)

AB\C	0	1
0,0	1	0
0,1	1	1
1,1	1	1
1,0	0	0

3)

AB\CD	0,0	0,1	1,1	1,0
0,0	1	0	0	1
0,1	0	0	1	1
1,1	0	0	0	0
1,0	1	0	0	1

4)

AB\CD	0,0	0,1	1,1	1,0
0,0	1	0	1	1
0,1	0	0	1	1
1,1	0	0	0	0
1,0	1	0	0	1

5)

AB\CD	0,0	0,1	1,1	1,0
0,0	0	0	0	0
0,1	1	1	1	1
1,1	1	1	1	1
1,0	1	1	1	1

6)

AB\CD	0,0	0,1	1,1	1,0
0,0	1	0	0	1
0,1	0	1	1	0
1,1	0	1	1	0
1,0	1	0	0	1

7)

AB\CD	0,0	0,1	1,1	1,0
0,0	1	1	0	0
0,1	0	1	1	0
1,1	0	0	1	1
1,0	0	0	0	1

8)

A\BC	0,0	0,1	1,1	1,0
0	0	1	0	0
1	1	1	1	1

  B. Use the Boolean lows simplify the following formulas

      a) $(AB)'+(A'+B)(B'+B)$

      b) $XY+X(Y+Z)+Y(Y+Z)$

      c) $(A+C)(AD+(AD)')+AC+C$

      d) $(A+B)(A+C)$

2.

A. Calculate the following

a) $11010_2 - 100_2$

b) $1100_2 + 11_2$

c) $AF_{16} - B_{16}$

d) $A99_{16} + F_{16}$

e) $675_8 - 476_8$

f) $11011_2 \times 10_2$

g) $11001_2 / 101_2$

B. Calculate the following bitwise operators

a) 11111_2 BITWISE AND 11_2
b) 111111_2 BITWISE OR 101_2
c) 111111_2 BITWISE XOR 1001_2

3.

A. Draw and label the process state diagram

B. Briefly explain the diagram

C. Name the 3 schedulers and give one functionality for each

D. What is virtual memory and give one function of it.

E. What is Kernel of Operating system and give 3 function of it.

4.

A. Convert the following in to Decimal

a) 2.3_8

b) $A.5_{16}$

c) 11.11_2

B. Convert the following in to Binary

a) 3.5_8

b) $4.F1_{16}$

c) 23.5_{10}

C. Convert the following in to octal
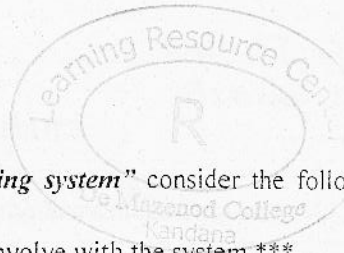
a) 34_{10}

b) 111011_2

c) 121_{16}

D. Convert the following in to hexadecimal

a) 111101_2

b) 1234_8

c) 16_{16}

5. Refer to the upper school student's *"library membership issuing system"* consider the following information.

consider there are many class teachers and many students are involve with the system.*

Student request library membership form and student receive the application form from the assistant librarian .

Student fills the application form and handover to the class teacher. Class teacher certify the application form and hand over to the assistant librarian. Student hand over the student record book to the assistant librarian.

- ✓ Assistant librarian checks the valid application with the help of student record book. Assistant librarian handed over the Student record book to the chief librarian.
- ✓ Student pay the membership bill to the library cashier .Student receive the bill payment receipt by cashier. Cashier handover the payment bill description to the chief librarian.
- ✓ Chief librarian handle the membership issuing with the help of student Record book, valid application forms and payment details.
  Student receive the student record book with membership number and student receive valid membership card.
  A. Identify the two external entities of the current system.(2)
  B. Draw the activity diagram for the current system and label the system boundaries.(10)
  C. Draw document flow diagram for the current system.(10)
  D. Name 2 case tools which can used to draw the physical design of the current system.(3)

6. Refer to the case study *"library membership issuing system"* consider the following information.
Student receive the library member ship application form from the assistant librarian. Student fill the membership application form and hand over the filled member ship application form to the class teacher. Class teacher certify and hand over the certified membership application form to the assistant librarian.

Student handover the student record book to the assistant librarian(hint: consider the student record book as document, not the storage).

- ✓ Assistant librarian checks the membership application with the help of student record book and certified membership application. And store the valid application details are in manual (M1) valid application file. Assistant librarian handed over the student record book to the chief librarian.
- ✓ Student pay the bill to the cashier. Casher handle the bill and issue the bill receipt to the student. Cashier save the payment details in manual (M2)payment file.
- ✓ Chief librarian use the M1valid application file , M2payment file and student record book. Chief librarian handel the membership and issue the valid membership card and hand over the student record book with the membership Number to the student .Chief librarian save the valid member details in M3 valid member file.

consider there are many class teachers and many students are involve with the system.*
  A. Draw the Level 0 DFD (context diagram)   (10)
  B. Draw the level 1 DFD for above case study.   (10)
  C. With refer to the case study Library membership issuing system read the following BSO.

BSO-1

Multi_user management information system

- ✖ Satisfies all the essential requirements of Library membership issuing system
- ✖ Multi_user system with four computers connect with server and a laser printer.
- ✖ Computers 40-80 Gb hard disk
- ✖ Pentium - 4 2.66 GHz
- ✖ Cost

4 Computers	- 200 000/=
Laser printer	- 28 000/=
1 Server	- 100 000/=
Total	- 328 000/=

BSO-2

- ✖ Satisfies all the essential requirements
- ✖ Provides decision-making support with a built in array of statistical & operation research tools.
- ✖ Multi-user system with four computers connect with server and a laser printer.
- ✖ Computers 40-80 Gb hard disk
- ✖ Pentium - 4 2.66 GHz
- ✖ Cost

4 Computers	- 200 000/=
Laser printer	- 28 000/=
1 Server	- 125 000/=
Total	- 353 000/=

BSO-3

- ✖ Satisfies all the essential requirements of the business.
- ✖ Facilitates for online advertising, reservations and payments, online membership.
- ✖ A WAN system with 4 computers and laser printer.
- ✖ Computers 40-80 Gb hard disk
- ✖ Pentium - 4 2.66 GHz
- ✖ Cost

4 Computers	- 200 000/=
Laser printer	- 28 000/=
1 Server	- 100 000/=
1 Modem	- 5 000/=
Total	- 333 000/=

BSO-4

✖ Satisfies all requirements of the business.
✖ Facilitates for online booking, advertising, viewing books and online membership.
✖ A WAN system with 4 computers and 4 laser printer.
✖ Computers 40-80 Gb hard disk
✖ Pentium - 4   2.66 GHz
✖ Cost

4 Computers	- 200 000/=
4 Laser printer	- 112 000/=
1 Server	- 100 000/=
1 Modem	- 20 000/=
Total	- 432 000/=

a) What is the most suitable BSO for Library membership issuing system.   (2marks)
b) Justify your answer with 3 reasons.   (3marks)