Kafrelsheikh University
Faculty of Engineering
Electrical Engineering Dept.
Subject:Computer Technology

[16/1/2018]

Final Term Exam
Prep. Year
Time: 3 hours
Full mark: 60

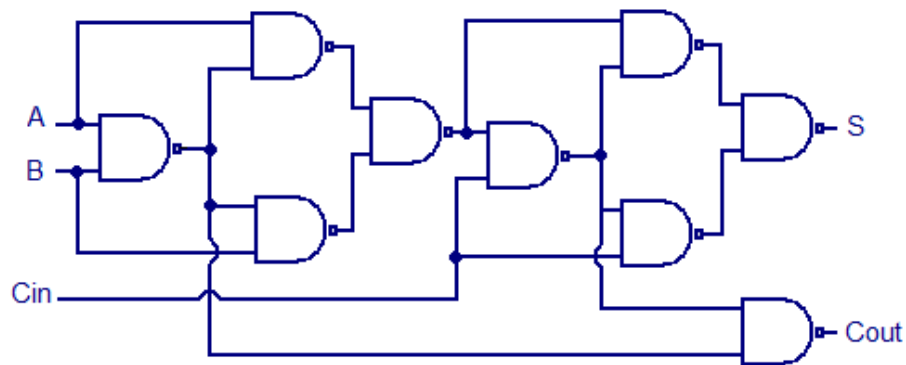## (Model Answer)

Question [1]: [20 marks] [ILOs: a2,b3,c5]

a) Design a one bit full adder , adds 1bit "a" to 1 bit "b" , result 1 bit "S" , consider carry from lower bit "Cl" and carry to a higher bit "Ch"

A	B	CIN	COUT	S
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

3MARKS

$S = A'B'C_{IN} + AB'C_{IN}' + A'BC'_{IN} + ABC_{IN}$

$C_{OUT} = A'BC_{IN} + AB'C_{IN} + ABC'_{IN} + ABC_{IN}$
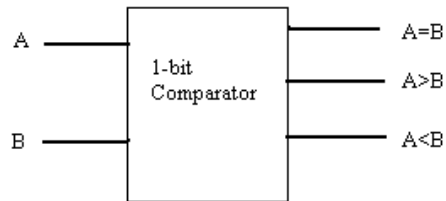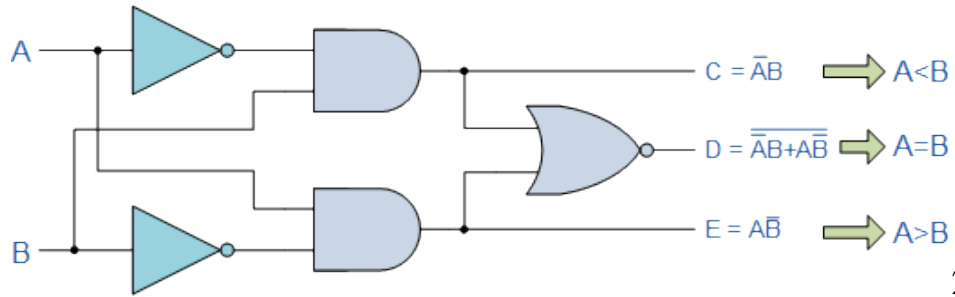

Full adder using NAND logic

3M

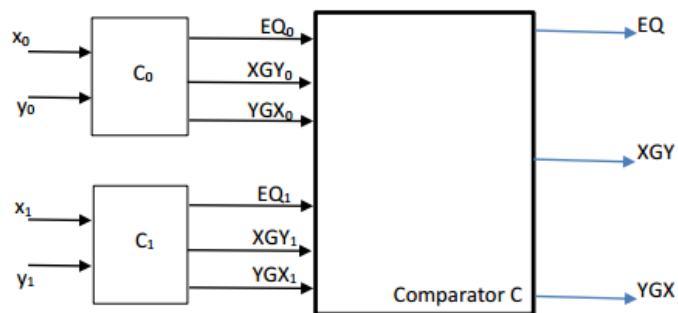b) Design a one bit comparator that compares 1bit "a" to 1 bit "b" resulting either of 3 outcomes: less if a<b, equal if a=b , greater if a>b. use this module to compare 2 bits "a -number" to 2 bits "b- number"
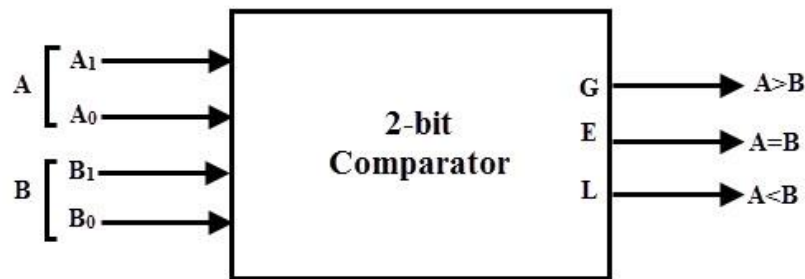
Input		Outputs		
X	Y	X>Y	X=Y	X<Y
0	0	0	1	0
0	1	0	0	1
1	0	1	0	0
1	1	0	1	0

2MARKS

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$C = \bar{A}B \Rightarrow A<B$

$D = \overline{\bar{A}B + A\bar{B}} \Rightarrow A=B$

$E = A\bar{B} \Rightarrow A>B$

2M

Inputs				Outputs			Inputs				Outputs		
X		Y		X>Y	X=Y	X<Y	X		Y		X>Y	X=Y	X<Y
0	0	0	0	0	1	0	1	0	0	0	1	0	0
0	0	0	1	0	0	1	1	0	0	1	1	0	0
0	0	1	0	0	0	1	1	0	1	0	0	1	0
0	0	1	1	0	0	1	1	0	1	1	0	0	1
0	1	0	0	1	0	0	1	1	0	0	1	0	0
0	1	0	1	0	1	0	1	1	0	1	1	0	0
0	1	1	0	0	0	1	1	1	1	0	1	0	0
0	1	1	1	0	0	1	1	1	1	1	0	1	0

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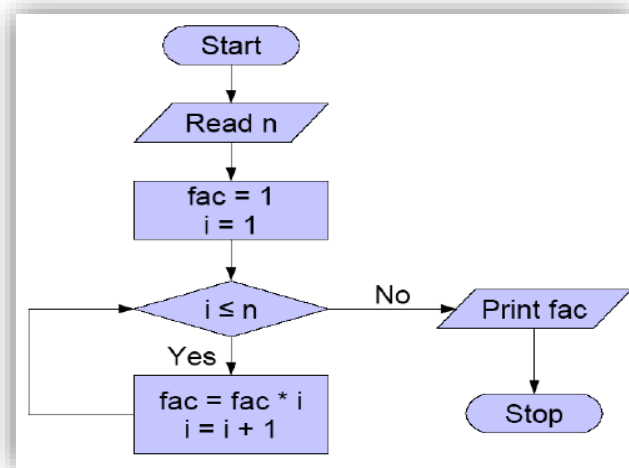Time: 3 hours
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3M

c) Draw a flowchart, write an algorithm and write a C program to calculate the factorial of a number.

Flowchart: 3M

Algorithm:

step 1. Start
step 2. Read the number n
step 3. [Initialize]
   i=1, fac=1
step 4. Repeat step 4 through 6 until i=n
step 5. fac=fac*i
step 6. i=i+1
step 7. Print fac
step 8. Stop

C program: 4M

```c
#include<stdio.h>
void main()
{ int n,i,fac=1;
 printf("Enter any number : ");
 scanf("%d", &n);
 for(i=1; i<=n; i++)
   fac = fac * i;
 printf("Factorial value of %d = %d",n,fac);
 }
```

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Question [2]: [40 Marks] [ILOs: a1,a2,a3,b1,b3,b4,c3,c5,d4]

أجب عن هذا السؤال بالورقة المخصصة لذلك والموجودة فى نهاية كراسة الإجابة

- **Write True (T) or False (F) for the following sentences:**

1) Email allow attaching files via messages. **(T)**

2) SMS messages can be sent to you when the system is off. **(T)**

3) HD capacity is more than flash memory. **(T)**

4) Scanner converts the hard copy into softcopy. **(T)**

5) Flash memory is considered as I/O device. **(T)**

6) Increasing resolution of screen improves the quality of picture. **(T)**

7) Printer converts the hard copy into softcopy. **(F)**

8) Pocket computers are the most expensive systems. **(F)**

9) GUI stands for general used icons. **(F)**

10) RAM stands for real access mode. **(F)**

11) SRAM is non volatile memory. **(F)**

12) Speakers are input devices. **(F)**

13) In Arduino Uno, The number of digital I/O is 10.   **(F)**

14) Windows operating system must be booted before starting any computer process.**(T)**

15) Flash memory is NVRAM. **(T)**

16) Adobe Photoshop program is used to edit pictures. **(T)**

17) Print Screen key in the keyboard is used to copy the screen in image format. **(T)**

18) Computer networks aims to share their resources. **(T)**

19) Service providers include firewall to protect themselves from hackers. **(T)**

20) ISDN stands for integrated services data network. **(T)**

21) Supercomputers are faster than personal ones. **(T)**

22) Speed of processor is measured by MHZ. **(T)**

23) CPU includes ALU and control unit. **(T)**

24) Each computer connected to internet must has its own address number (IP). **(T)**

25) $675_{10} = 1243_8$ **(T)**

26) $12.25_{10} = 1100.01_2$ **(T)**

27) Touch screen is for data out only. **(F)**

28) Internet is a LAN network. **(F)**

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29) The following code: **digitalWrit(IN4, LOW);   dely(500);** has 3 errors. **(F)**

30) AA $_{16}$ x 25 $_{10}$ = 348 $_8$ **(F)**

31) Extension for power point files is   .doc   **(F)**

32) Giga hertz is used to measure memory capacity**.   (F)**

33) Arduino Uno can be used for Traffic Light by using 3 DC Motors.   **(F)**

34) In Arduino Uno, The number of analog inputs is 6.   **(T)**

35) ROM stands for Read only memory**. (T)**

36) The following code: **if(distance<30) { stopm(); sharpright();}** has no errors.**(T)**

37) LAN allows sharing printers. **(T)**

38) Arduino Uno can detect the distance by using Ultrasonic sensor.**(T)**

39) Dc motor drive used for control of the speed of DC Motors.   **(T)**

40) Arduino is very good for rapid Prototyping. **(T)**

- **Select the suitable answer of the following:**

41) Which of the following is a part of CPU
   a) ALU   b) Printer   c) HD   d) Otherwise

42) Which of the following is an output unit:
   a) mouse   b) printer   c) camera   d) Scanner

43) Which of the following is non volatile memory?
   a) RAM   b) Camera   c) HD   d) Otherwise

44) Starting Information about the connected input/output devices are stored in:
   a) RAM   b) Operating System   c) HD   d) BIOS

45) Functions of Os are
   a) file management   b) error management   c) Both a,b   d) Otherwise

46) To compute a mathematical term, computer uses:
   a) keyboard b) ALU   c) memory   d) Otherwise

47) Which part is not included in CPU?
   a) Printer   b) Control unit   c) Cache memory   d) Otherwise

48) Extension of document file is:
   a) .xls   b) .doc   c) .html   d) .ppt

49) which of the following is a volatile RAM.
   a) Magnetic disks   b) Memory cards   c) DRAM   d) Otherwise

50) What data type can be processed by computers
   a) text   b) pictures   c) videos   d) a,b,c

51) A company has 2 LAN networks in 2 distinct towns , the 2 networks are connected.
   This type of network is?   a) LAN   b) MAN   c)FAN   d) WAN

52) In computers, subtraction is carried out using:
   a) 9's complement   b) 1's complement   c) 2's complement   d) Otherwise

53) **4AC** XOR **B2D** =…...   a) 42F   b) F81   c) 02D   d) Otherwise

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54) POST term in computer stands for:
a) power on self test   b) post office box   c) test the message   d) Otherwise

55) Logical simplification for the expression $f = A.B'+A.C+B.C' +A'.C' =$
a) A+B.C   b) A+ C'   c) A' +B'   d) Otherwise

56) Logical simplification for the expression $f = x'.y'.z'+ x.y'.z' +x.y'.z +x'.y' .z=$
a) x+y.z   b) x' +y'   c) y'   d) Otherwise

57) Logical simplification for the expression $f = x+ x'.y + x.y'.z =$
a) x+y+z   b) y'   c) x.y   d) x +y

58) $1100\ 1100_2 = \ldots\ldots$
a) 204_{10} b) 314_8 c) CC_{16} d) All of these

59) $ABC_{16} = \ldots\ldots$
a) 5247_8 b) 101010111011_2 c) 2784_{10} d) Otherwise

60) $120_8 = \ldots\ldots$
a) 50_{16} b) 80_{10} c) 1010000_2 d) All of these

61) $110.011_2 = \ldots\ldots$
a) 6.33_8 b) 6.7_{16} c) 6.31_{10} d) 6.3_8

62) $AB.CD_{16} = \ldots\ldots$
a) 101.101_2 b) Otherwise   c) 253.632_8 d) 171.181_{10}

63) $AB.A_{16} = \ldots\ldots$
a) Otherwise   b) 10101011.101_2 c) 293.5_8 d) $1C1.625_{10}$

64) $101_2\ X\ 101_2 = \ldots\ldots$
a) 25_{10} b) 101011_2 c) 23_8 d) Otherwise

65) $1000_2 - 1_2 = \ldots\ldots$
a) A_{16} b) 7_{10} c) 8_8 d) All of these

66) $1101_2\ X\ 10_2 = \ldots\ldots$
a) 25_{10} b) 101011_2 c) 32_8 d) Otherwise

67) $77_8 - 76_8 = \ldots\ldots$
a) 1_{16} b) 1_{10} c) 1_2 d) All of these

68) $55_{16} + 15_{10} = \ldots\ldots$
a) 46_{16} b) 140_8 c) 100_{10} d) All of these

69) $144_8 \div 10_{10} = \ldots\ldots$
a) A_{10} b) A_{16} c) 21_8 d) All of these

70) The number of errors in the following Code: **pinMode(IN3,OUTPUT);**
a) Zero   b) 2   c) 3   d) 5

71) The number of errors in the following Code: **Digitalwrite(IN2, Low);**
a) 2   b) Zero   c) 5   d) 7

72) The number of errors in the following Code: **analogWrite(ENB,100)**
a) 3   b) 1   c) 2   d) Zero

73) The following code: **if(distance<30) { stopm() sharpright();}** has
a) 3 errors   b) 2 errors   c) 1 error   d) No errors

74) In Arduino Uno board: Which pin has a built-in LED?
a) Pin A0   b) Pin 15   c) Pin 7   d) Pin 13

75) What voltage does the Arduino operate at?
a) 50 volts   b) 35 volts   c) 5 volts   d) 75 volts

76) How many arguments does the function **pinMode** need to have??

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a) 4   b) 2   c) 3   d) 1

77) In Arduino: What does IDE stand for?

a) Integrated Development Environment   b) Internet Data Exchange

c) Identifier Extension   d)Otherwise

78) Number of error in the following C code is: **printF("How are you?\n")**

a) 2   b)Zero   c)1   d) Otherwise

79) Number of error in the following C code is: **scanf("%d", n);**

a) 1   b)Zero   c) 2   d)Otherwise

80) Number of error in the following C code is: **if (n < 0) printf("Error!");**

a) Zero   b) 2   c)1   d)Otherwise

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Good luck: *Prof. Dr.: Ali Sakr &&   Dr. Eng.: Tamer Medhat*