भारतीय सूचना प्रौद्योगिकी संस्थान कोटा
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY KOTA

B.Tech. (CSE+ECE), Semester – I
End Term Examination, Odd Semester 2022-23

Circuit Theory (ECT103)

Marks: 30 (Weightage – 30%) **Time: 90 minutes** **Date: January 5, 2023**

Note: Attempt all questions in sequence. Attempt all parts of a question at one place. Show all the steps.

KVL, KCL, Thevinen, Norton, superposition, Max. power

1. Solve for Vx in the circuit shown in Fig. 1 using superposition theorem. **[6]**

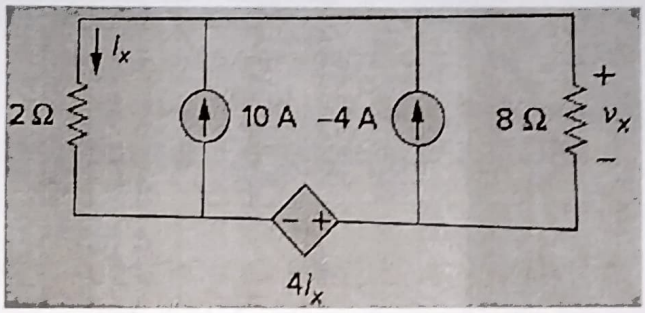
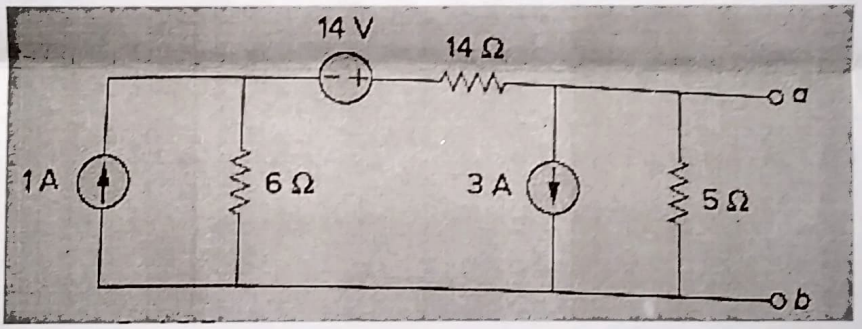


Fig. 1

2. Find the Thevenin's and Norton's equivalent circuits at terminal a-b of the circuit given in Fig. 2. **[6]**



3. What resistor connected across terminals a-b will absorb maximum power from the circuit shown in Fig. 3? What is that maximum power? **[6]**

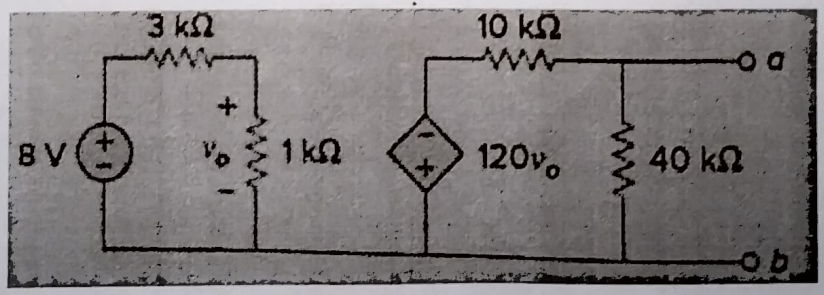


Fig. 3

4. Use mesh analysis to calculate the currents i_1 and i_2 as shown in circuit 4. [6]

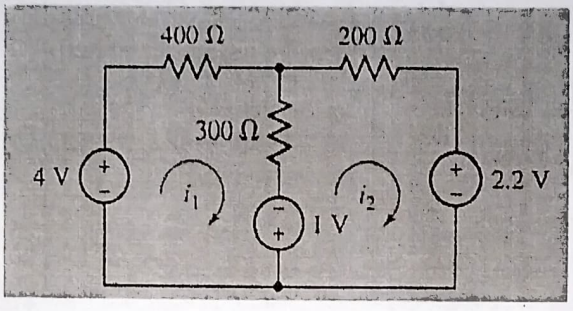


Fig. 4

5. Use nodal analysis to calculate the voltages v_1 and v_2. [6]

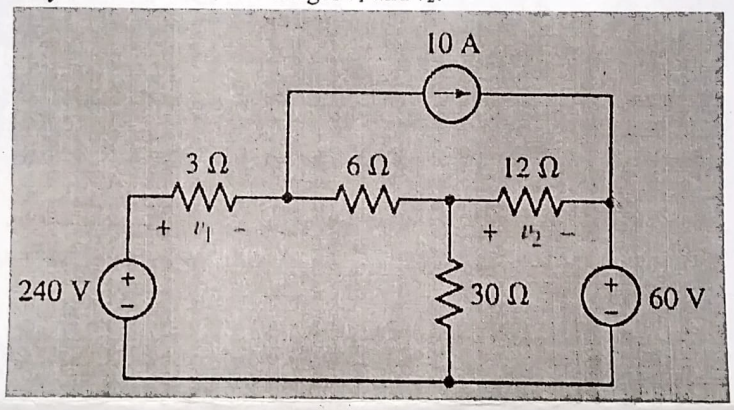


Fig. 5

*** *Be Good, Do Good* ***

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INDIAN INSTITUTE OF INFORMATION TECHNOLOGY KOTA

B.Tech. (ECE/CSE), Semester – I
Mid-Term Examination – 2023

Digital Design (ECT101)

Marks: 30 **Time: 90 minutes** **Date: January 6, 2023**

Note: All questions are compulsory. Any missing data may be assumed suitably.

Start to Half & Full Adder

1) Find the outcome of Binary addition operation, 1001+1010 assuming the operands are
   (a) Unsigned
   (b) Sign magnitude
   (c) Two's complement [2+2+1]

2) Using 3's complement method, perform the subtraction of the following two numbers in base-4 notation $0213_4 - 32104_4$. You need to show the subtraction completely without actually changing the base. Show the complete calculation for full credit. [5]

3) Find the number of minterms in the canonical SOP form for a Boolean function $F(A,B,C) = A + BC$. [4]

4) Design the Exclusive OR gate using a minimum number of:
   (a) NAND gates [2]
   (b) NOR gates [2]
   (c) Evaluate $1 \oplus X \odot 0 \oplus Y \odot 1$ [1]

5) (a) Assume high logic as '1' and low logic as '0'. For a given 4-bit input data bit, find output (in 4-bit) of a given combinational logic circuit diagram as shown in Fig.1. [2]

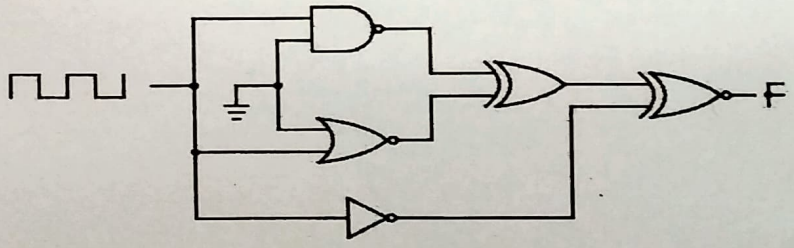
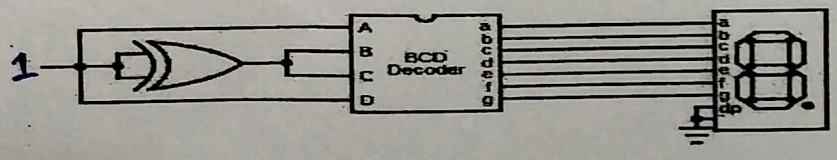


Fig.1

(b) Using Boolean algebra, prove that $Y = A(B + C) + BC = AB + (A \oplus B)C$ and draw a truth table. [3].

6) (a) Design a 4-bit BCD-to-excess-3 code converter using the unused combinations of the code as don't-care conditions and draw the combination logic circuit diagrams. [5]
   (b) Consider a BCD decoder as BCD to 7 segment converters as shown in Fig.2, which of the 7-segments will glow for a given set of input data bit? [1]



INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, KOTA

B.Tech I year, Semester I

Mid Term Examination Jan 2023

Communication Skills (HST 101)

CSE and ECE

Diary of Anne Frank
Wings of Fire
Grammar

Time: 1.30 mins

MM: 30

Instructions: The paper consists of 3 sections .All sections are compulsory.

SECTION A

A. **Answer the following question in about 60 words each. Attempt any 5 question.** **(5x 2= 10)**

1) **What was the influence of Jallaluddin on the life of Abdul Kalam? Substantiate your answer with proper details from the text.**
2) **How can you prove that Anne Frank's diary is a record of the agonizing experiences faced by Jews during the Second World War? What role does the diary play in making her the person she becomes?**
3) **What was Abdul Kalam's concept of 'spirituality'?**
4) **Bring out the difference between an autobiography and a diary as a form of creative outburst.**
5) **Draw a character sketch of A P J Abdul Kalam by drawing details from the extract of 'Wings of Fire'.**
6) **What do you understand by Holocaust? What is the main focus of such writings?**

SECTION B

B. **Do as directed (any 6 questions from 7 to 13)** **(2*6=12)**

7) **Make two words using each prefix:** **(2)**
   a) multi- **b) non-**

8) **Write two synonyms for each word:** **(2)**
   a) Enormous **b) Amicable**

9) **Give one word substitutions for:** **(2)**
   a) A believer in the existence of god.....
   b) A period of ten years .....

10) **Give the antonym for each word:** **(2)**
    a) Adversity **b) Opposition**

11) **Change the following sentences from active to passive:** **(2)**

    a) She is going to deliver the letter. **b) He has done his homework.**

12) Fill in the blanks with appropriate forms of verbs given in the brackets: (2)

a) Ten miles---------- (is/are) a long way to walk.
b) This morning the news ---------- (is/are) good but I am afraid it might worsen any day.
c) All the information you gave me last time---------- (was/were) completely true.
d) Measles ---------- (is/are) not very painful but quite annoying.

13) Complete the following sentences: (2)

a) The zookeeper would have punished her with a fine if.....
b) If you take your driving lessons regularly .....
c) If my friend borrowed my car and got a speeding ticket.....
d) I can run faster if .....

SECTION C

14. Expand <u>any one topic</u> in about 70 words : (3)

CREATIVITY / FREEDOM / PEN IS MIGHTIER THAN THE SWORD

15. Read the passage and answer the following questions given below: (5)

How can children be taught to rely upon their own spiritual resources and resist the temptation to become reading addicts, hearing addicts, seeing addicts? First of all they can be taught how to entertain themselves, by making things themselves, by playing musical instruments, by purposeful study, by scientific observations and by the practice of some art and so on. But such education of the hand and of the intellect is not enough. In Psychology the Gresham's law suggests –that bad money drives out the good. So is the case in life where most people tend to perform the actions that require least efforts, to think the thought that are easiest to fill, the emotions that are most vulgarly commonplace, to give rein to their desires. Along with necessary knowledge and skill must be given the will to use them under the pressure of incessant temptation to take the line of least resistance. Most people will not wish to resist these temptations unless they have a coherent philosophy of life, which makes it reasonable and right for them to do so. The other method of heightening resistance to suggestion is purely intellectual and consists of training young people to subject the diverse devices of the mass media to critical analysis .The first thing that education must do is to analyze the words currently used in newspapers, on platforms by preachers and broadcasters. Their critical analysis and constructive criticism should reach out to the children and the youth, with such clarity that they learn to reach to forceful suggestions in the right way at the right time.

Answer the following questions briefly: (1*5=5)

1. **How can children be taught from becoming reading, hearing and seeing addicts?**
2. **What can critical analysis help us?**
3. **What is the meaning of the Gresham's Law?**
4. **What should be the real aim of education?**
5. **Find the word from the passage that means 'logical and consistent'**

Reg ID.

Indian Institute of Information Technology, Kota (Rajasthan)

Mid-Term Examination- Jan 04, 2023

Time: 1 h 30 m
Max Marks: 30
Note: All questions are compulsory.

Subject: Mathematics - I
Couse Code: MAT101

Matrices & Partial Derivatives

Q. 1 If $A = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$, then show that $A^n = A^{n-2} + A^2 - I$ for $n \geq 3$. Hence find A^{50}. (5)

Q.2 Discuss and sketch the curve $r = a + b\cos\theta$, $(a > b > 0)$. (5)

Q.3 For what values of the parameter λ and μ do the system of equations $x + y + z = 6, x + 2y + 3z = 10$ and $x + 2y + \lambda z = \mu$ has (i) unique solution (ii) infinite number of solutions (iii) no solution. (5)

Q.4 If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$, then find the value of $x^2\frac{\partial^2 u}{\partial x^2} + y^2\frac{\partial^2 u}{\partial y^2} + 2xy\frac{\partial^2 u}{\partial x \partial y}$. (5)

Q.5 Find all the asymptotes to the curve $(x + y)^2(x + y + 2) - x - 9y + 2 = 0$. (5)

Q.6 Find eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ and hence obtain the eigen values of $\boldsymbol{adjoint}\ (\boldsymbol{A})$. (5)

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Indian Institute of Information Technology Kota

Department of Computer Science and Engineering

Mid Term Examination (January 2023)

Computer Science and Programming (CST101)

Start to loops

Duration: 1.5 hrs

Max Marks: 30

Part I

Q1. Identify and correct the errors in each of the following statements (Note: There may be more than one error per statement. For each statement, either write **No error** or specify and correct the error in each statement) **5 marks**

a)
```
scanf("d", value);
```
b)
```
printf("The product of %d and %d is %d"\n, x, y);
```
c)
```
firstNumber + secondNumber = sumOfNumbers
```
d)
```
if (number => largest)
    largest == number;
```
e)
```
*/ Program to determine the largest of three integers /*
```
f)
```
Scanf("%d", anInteger);
```
g)
```
printf("Remainder of %d divided by %d is\n", x, y, x % y);
```
h)
```
if(x = y);
    printf( %d is equal to %d\n", x, y );
```
i)
```
print("The sum is %d\n," x + y);
```
j)
```
Printf( "The value you entered is: %d\n, &value );
```

Q2. What is the output of the following code? **3 marks**

```
#include<stdio.h>
int main()
{
  int a=15, b=1,e,f;
  if(a<b?a:b)
  {
    e=a&b;
    printf("%d", e);
  }
 else
  {
    f=a^b;
    printf("%d",f);
  }
  return 0;
}
```

Q3. Fill in the blanks in each of the following. **4 Marks**

(a) Every C program begins execution at the function_____

(b) The _____begins the body of every function and the_____ ends the body of every function.

(c) Every statement ends with a(n) _____

(d) The _____ standard library function displays information on the screen.

(e) The escape sequence *\n* represents the _____ character, which causes the cursor to position to the beginning of the next line on the screen.

(f) The _____Standard Library function is used to obtain data from the keyboard.

(g) The conversion specifier_____is used in a *scanf* format control string to indicate that an integer will be input and in a *printf* format control string to indicate that an integer will be output.

(h) The_____ statement is used to make decisions.

Q4. Given the sides of a triangle, write a C program to find whether the triangle is equilateral, isosceles, or right angled. **4 marks**

Q5. Draw a flow chart to find the maximum of four numbers.

2 marks

Q6. Write a program in 'C' that takes input an integer number of seconds and print the equivalent time in hours, minutes and seconds. The recommended output format is something like 7322 seconds is equivalent to 2 hours 2 minutes 2 seconds. **4 marks**

Q7. Write the answer to the following **3 marks**

1. Convert 42 (base 10) into a binary number (base 2)
2. Convert 10110100 (base 2) into the hexadecimal system (base 16)
3. 1 KB= _____ Bits

Part II

Q8. Write the output of the following code/program? (if error, then specify the cause of error) **5 marks**

A.

```
#include <stdio.h>
int main()
{
  int a = 20;
  ;
  ;
  printf("%d", a);
  ;
  return 0;
}
```

B.

```
#include<stdio.h>
int main() {
  int i;
   if(i=0,2,3)
     printf("IIITKOTA");
   else
    printf("Computer Science programming");
  printf("%d\n", i);
  return 0;
}
```

C.

```
#include <stdio.h>
void main()
{
  int a = 1, b = 2, c = 3;
  c = a = = b;
  printf("%d", c);
}
```

D.

```
#include <stdio.h>
int main(){
  int x = 0;
  int y;
  x = (x = = (x = = 1));
  printf("%d", x);
  return 0;
}
```

E.

```
#include <stdio.h>
int main()
{
int a = 25;
printf("%o %x", a, a);
return 0;
}
```