Kanman Science and Technology University
Department of Computer Science and Engineering
1st Year 1st Semester B.Sc. Engineering Final Examination-2017

Course Title: Electrical Circuit Analysis **Course Code: EEE 105**
Total Marks: 60 **Time: 3 (three) Hours**

N.B. :i) Answer **SIX** questions taking any **THREE** from each Section,
ii) All questions are of equal values,
iii) Use separate answer script for each section,
iv) All symbols represent their usual meaning

Section-A

1. a) Define node, junction, loop and mesh from circuit diagram and also identify it? 3

b) Find the values of V_1, V_2, and V_3 from the following circuit in figure- 1(b). 3

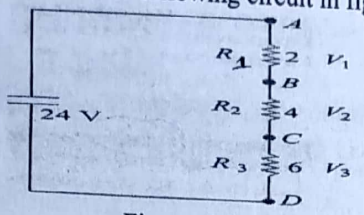


Figure- 1(b)

c) Find the Norton's equivalent circuit for the network in figure-1(c) and current (I_2) through the resistor R_2, where E_1= 120V, E_2 =180V, R_1=40Ω, R_2= 12Ω, 24Ω, 36Ω and R_3= 60Ω. 4

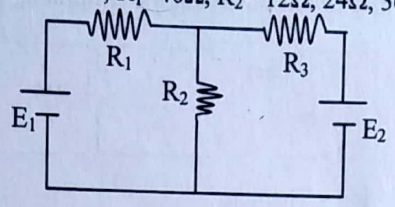


Figure-1(c)

2. a) Find the Thevenin's equivalent circuit and current through the R_3= 7Ω for the network in figure-2(a). 4

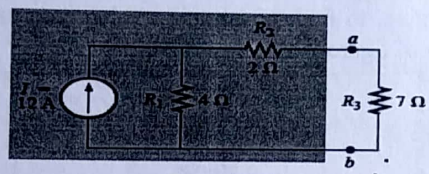


Figure-2(a)

b) Explain the Kirchhoff's voltage law and Kirchhoff's current law with proper circuit examples. 2

c) What is power factor? Determine the average power dissipated in a network whose input current and voltage are the following: 4

$$i = 5 \sin (\omega t + 40^0)$$
$$v = 10 \sin (\omega t + 40^0)$$

3. a) In the network of figure-3(a), using Reciprocity theorem, find (i) ammeter current when battery is at A and ammeter at B and (ii) when battery is at B and ammeter at point A. Also calculate the transfer resistance. 5

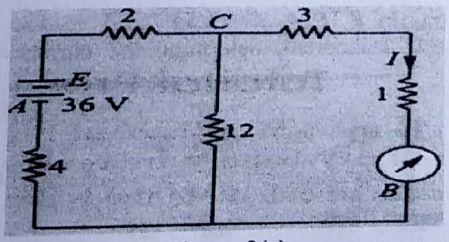


Figure-3(a)

b) Write down the application of filter circuits. Classify the filter circuits. 2

c) For the following pairs of voltage and current, determine whether the element involved is a capacitor, an inductor or a resistor. Determine the value of C, L, or R if sufficient data are provided. 3

$$v = 1000 \sin (377t + 10^0)$$
$$i = 5 \sin (377t - 80^0)$$

4. a) Find the voltage across and current through the load resistor R_L in the circuit of figure-4(a) using Millman's theorem. 4

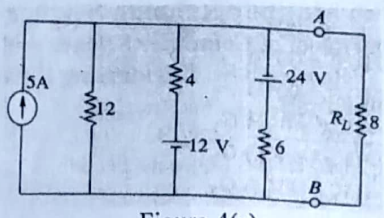


Figure-4(a)

b) Prove that $I_{rms} = 0.707\ I_m$. 4

c) What is the phase relationship between the following waveforms: 2

$v = 10 \sin(\omega t + 30^0)$

$i = 5 \sin(\omega t + 70^0)$

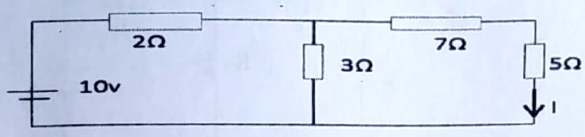
Section-B

5. a) Prove that average power $P = V_{rms} I_{rms} \cos(\theta)$. Find the real power for resistor and inductor. 5

b) Draw the high-pass RL filter circuit and mention its output voltage and cutoff frequency equations. 2

c) Design a high-pass RL filter that has a cutoff frequency of 4 kHz when R = 3 kΩ. Calculate the inductor of inductance L. 3

6. a) Prove that the following circuit satisfying the reciprocity theorem: 4



b) State and Explain Norton's Theorem? 4

c) Define the peak amplitude and peak-to-peak value of a waveform. Mention the tasks of function generator. 2

7. a) Use Millman's theorem, to find the common voltage across terminals A and B and the load current in the circuit of figure-7(a). 4

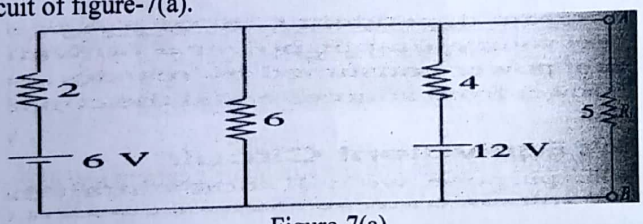
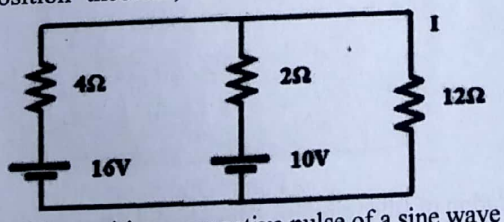


Figure-7(a)

b) Show that if the source current leads the applied voltage, the network is predominantly capacitive, and if the applied voltage leads the source current, the network is predominantly inductive. 4

c) The current through a 5Ω resistor is given. Find the sinusoidal expression for the voltage across the resistor for $i = 40 \sin(377t + 30^0)$. 2

8. a) Using the superposition theorem, determine the current through the 12Ω resistor of the following figure: 5



b) Show that the area of the positive or negative pulse of a sine wave is $2A_m$. 2

c) What is phasor? Perform the following division and leave the answer in rectangular form. 3

$(8 + j8)/(2 + j2)$

Bangabandhu Sheikh Mujibur Rahman Science and Technology University
Department of Computer Science and Engineering
1st Year 1st Semester B.Sc. Engineering Final Examination-2017

Course Title: Introduction to Computer Systems **Course Code: CSE101**
Total Marks: 60 **Time: 3 (three) Hours**

N.B.
i) Answer **SIX** questions taking any **THREE** from each Section, ii) All questions are of equal values.
iii) Use separate answer script for each section

Section: A

1.	**a)**	Describe the various types of computers on the basis of applications. How many ways computer data can be represented? Explain each of them with examples.	4
	b)	What do you understand by computer architecture? Is it same as computer organization? If no, explain the difference between them.	4
	c)	How does the control unit assist the CPU in carrying out its operations?	2
2.	**a)**	What is cache hit? Explain the concept of using the cache memory in computer system with diagram.	4
	b)	What is the importance of decoding phase of machine cycle? Which component of CPU plays an important role in decoding phase?	4
	c)	List the different types of CPU registers.	2
3.	**a)**	Illustrate the communication process between the processor and printer.	4
	b)	Explain the importance of a bus in the computer system. What are the different types of buses usually found in the computer system?	4
	c)	What are the purposes of synchronous DRAM?	2
4.	**a)**	Why complement is needed in the computer system? Subtract 12 from 11 using two's complement.	4
	b)	Why ASCII code is used? Convert the binary number 10100011 to its equivalent Gray coded.	3
	c)	What is nibble? Represent the decimal digits (0-9) in excess-3 BCD code.	3

Section: B

5.	**a)**	"A computer software performs two distinctive tasks". Mention these two tasks. Which software is responsible for which tasks?	4
	b)	List at least six utility programs with their functions.	3
	c)	What is a debugger? Why is it used?	3
6.	**a)**	Write down the instruction for find out the best of two out of three on a worksheet in MS-Excel.	4
	b)	Write a short note on the following commands: i) DIR, ii) COPY, iii) TREE, iv) COMP	4
	c)	Define the following terms pertaining to MS-PowerPoint: i) Slide pane, ii) Task pane, iii) Status bar, iv) Notes pane.	2
7.	**a)**	What is an operating system and why it is used?	3
	b)	What is the difference between process and program? State the different states of a process with appropriate diagram.	5
	c)	Write the features of RAM and ROM of computer system.	2
8.	**a)**	Explain the concept of peer-to-peer network.	2
	b)	What are the different types of network topologies? What are the limitations of ring topology?	6
	c)	What is web browser? Give at least three of them.	2

Bangabandhu Sheikh Mujibur Rahman Science and Technology University
Department of Computer Science and Engineering
1st Year 1st Semester B.Sc. Engineering Final Examination-2017
Course Title: Technical English Language **Course Code: ENG105**
Total Marks: 60 **Time: 3 (three) Hours**

Section- A

Read the following passage and answer the given questions:

In a culture obsessed with measuring talent and ability, we often overlook the important role of inspiration. Inspiration awakens us to new possibilities by allowing us to transcend our ordinary experiences and limitations. Inspiration propels a person from apathy to possibility, and transforms the way we perceive our own capabilities. Inspiration may sometimes be overlooked because of its elusive nature. Its history of being treated as supernatural or divine hasn't helped the situation. But as recent research shows, inspiration can be activated, captured, and manipulated, and it has a major effect on important life outcomes. Inspiration has three main qualities. Pyschologists Todd M. Thrash and Andrew J. Elliot have noted these core aspects of inspiration: evocation, transcendence, and approach motivation. First, inspiration is evoked spontaneously without intention. Inspiration is also transcendent of our more animalistic and self-serving concerns and limitations. Such transcendence often involves a moment of clarity and awareness of new possibilities. As Thrash and Elliot note, "The heights of human motivation spring from the beauty and goodness that precede us and awaken us to better possibilities." This moment of clarity is often vivid, and can take the form of a grand vision, or a "seeing" of something one has not seen before (but that was probably always there). Finally, inspiration involves approach motivation, in which the individual strives to transmit, express, or actualize a new idea or vision. According to Thrash and Elliot, inspiration involves both being inspired by something and acting on that inspiration.

Inspired people share certain characteristics. Thrash and Elliot developed the "Inspiration Scale," which measures the frequency with which a person experiences inspiration in their daily lives. They found that inspired people were more open to new experiences, and reported more absorption in their tasks. "Openness to Experience" often came before inspiration, suggesting that those who are more open to inspiration are more likely to experience it. Additionally, inspired individuals weren't more conscientious, supporting the view that inspiration is something that happens to you and is not willed. Inspired individuals also reported having a stronger drive to master their work, but were less competitive, which makes sense if you think of competition as a non-transcendent desire to outperform competitors. Inspired people were more intrinsically motivated and less extrinsically motivated, variables that also strongly impact work performance. Inspiration was least related to variables that involve agency or the enhancement of resources, again demonstrating the transcendent nature of inspiration. Therefore, what makes an object inspiring is its perceived subjective intrinsic value, and not how much it's objectively worth or how attainable it is. Inspired people also reported higher levels of important psychological resources, including belief in their own abilities, self-esteem, and optimism. Mastery of work, absorption, creativity, perceived competence, self-esteem, and optimism were all consequences of inspiration, suggesting that inspiration facilitates these important psychological resources. Interestingly, work mastery also came before inspiration, suggesting that inspiration is not purely passive, but does favor the prepared mind.

Inspiration is not the same as positive affect. Compared to the normal experiences of everyday life, inspiration involves elevated levels of positive affect and task involvement, and lower levels of negative affect. Inspiration is not the same state as positive affect, however. Compared to being in an enthusiastic and excited state, people who enter an inspired state (by thinking of a prior moment they were inspired) reported greater levels of spirituality and meaning, and lower levels of volitional control, controllability, and self-responsibility for their inspiration. Whereas positive affect is activated when someone is making progress toward their immediate, conscious goals, inspiration is more related to an awakening to something new, better, or more important: transcendence of one's previous concerns.

Inspiration is the springboard for creativity. Inspired people view themselves as more creative and show actual increases in self-ratings of creativity over time. Patent-holding inventors report being inspired more frequently and intensely than non-patent holders, and the higher the frequency of inspiration, the higher the number of patents held. Being in a state of inspiration also predicts the creativity of writing samples across scientific writing, poetry, and fiction (as judged by a panel of fellow students) independent of SAT verbal scores, Openness to Experience, positive affect, specific behaviors (e.g., deleting prior sentences), and aspects of the product quality (e.g., technical merit). Inspired writers are more efficient and productive, and spend less time pausing and more time writing. The link between inspiration and creativity is consistent with the transcendent aspect of inspiration, since

creativity involves seeing possibility beyond existing constraints. Importantly, inspiration and effort predi... different aspects of an activity. Individuals who exerted more effort writing spent more of their time pausing, deleted more words, wrote more sentences per paragraph, and had better technical merit and use of rhyming in poems, but their work was not considered more creative.

1. **A.**Write,in one sentence,the central idea of each of the five paragraphs of the given passage. 5
   B. Paraphrase this passage in your own words. 5
2. **A.**Transcribe the following words using IPA(any eight): 4
   Three,youth,century,north,pleasure,entry,job,believe,home,passage
   B.Correct the following passage using capitalization and punctuation marks: 6

a healthful snack

everyone loves a snack once in a while here is a recipe for making your own healthful snack first cut an apple in half and clean out the core next place some raisins in each half of the apple then sprinkle some cinnamon over the raisins place the apple halves on a cookie sheet and bake them in an oven for 20 minutes at 300 degrees finally remove the apple halves from the oven and let them cool a little then dig in

3. Correct the following passage: 10

Cell Phones Endanger Drivers

One of the recent developments in modern technology, cellular phones, can be a threat to safety. A study for Donald Redmond and Robert Lim of the university of Toronto showed that cellular phones poses a risk to drivers. In fact people who talk by the phone while driving are for times more likely to have an automobile accident than those whom do not use the phone while drive. I like to use my cell phone when I am driving because it is convenient. The researchers studied 699 drivers. Who were in an automobile accident while they were using they're cellular phones. The researchers concluded that the mane reason for the accidents was not that people used one hand for the telephone and one hand for driving. Instead the cause of accidents were usually that the drivers became distracted angry or upset by the phone call. As a result the drivers' lost concentration. Many people find that monthly plans are more economical than pre-paid plans.

Section-B

1. 15

(A). We are looking for a highly motivated postdoctoral researcher to work on Data Pitch (https://datapitch.eu/), an EU Horizon 2020 €7 million collaborative research and innovation programme involving industrial partners across Europe, which runs until December 2019. The post is based in the Web and Internet Science (WAIS) research group (www.wais.ecs.soton.ac.uk) which undertakes interdisciplinary research focusing on the science and technologyof the Web and the Internet.

The post is available for one year in the first instance.

Applications for Research Fellow positions will be considered from candidates who are working towards or nearing completion of a relevant PhD qualification. The title of Research Fellow will be applied upon successful completion of the PhD. Prior to the qualification being awarded the title of **Senior Research Assistant will be given.*

For further information please contact Professor Elena Simperl (email: e.simperl@soton.ac.uk).

Application procedure:

You should submit your completed online application form at www.jobs.soton.ac.uk. **The application deadline will be midnight on the closing date stated above**. If you need any assistance, please call Suzanne Stone (Recruitment Team) on +44 (0) 23 8059 4043.

OR

(B). Flora software Ltd. Is looking for some young and creative Assistant Programmers. Now write a cover letter for the post of Assistant Programmer with reference to an advertisement dated on 14 May 2017 in The Daily Star. Application should be sent to the Managing Director of Flora Software Ltd., 23/1 Banani, Dhaka on or before 30 May 2017.

2.Write an argumentative essay on any of the following topics: 15

(A). It's not the ideological difference among the teachers rather than the opportunistic ideology behind teacherpolitics isposing an enormousblow to the establishment of a solid and sound academic community. What do you think?

OR

(B). Some people think that universities should provide graduates with the knowledge and skills needed in the workplace. Others think that the true function of a university should be to give access to knowledge for its own sake, regardless of whether the course is useful to an employer. What, in your opinion, should be the main function of a university? Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj
Department of computer Science & Engineering
1st Year 1st Semester B.Sc. Engineering Final Examination-2017

Course Name: Structured Programming Language **Course Code: CSE103**
Full Marks: 60 **Times: 3(Three) Hours**

N.B.: i. Answer **SIX** questions, taking any **THREE** from each section.
ii. Figure in the right margin indicate full marks;
iii. Use **separate answer script** for each section.

Section A

1. a) Write various types of bitwise operator. If a = 7, b = 8 & c=5, write the output (X,Y) of the following statements:i). X = (a = = b)? a: b; ii). Y = (b > c)? b : c; 4

b) Write a program to take three integers in three variable x, y and z, from the terminal and rotate their values such that x become y, y become z and z become x. 4

c) If x = 9 & y = 11, what will be the output of the following statements: 2
i). a = (++x) + y; ii). c = a+(--y) + b;

2. a) Describe the four basic data types. How could we extend the range of values they represent? 2

b) What would be the value of x after execution of the following statements? 2

```
intx,y=50;
char z='a';
x=y+z;
```

c) What is the value of x, y and z in the following expression? 3

```
x = 5, y = 10, z = 3;
x += y;
y = x % -2;
z *= y;
```

d) Which of the following are invalid statement and why? 3
i) #define X=50 ii) # define MIN 25 iii) #define salary 2500; iv) #define K 5, M 11
v) #Define Array 40 vi) #define VALUES$ 50

3. a) What is an operand? What is the relationship between operator and operand? 2

b) Determine the value of each of the following logical expressions if a=6, b=12 and c=-6 4
(i) a>b && a<c (ii) a<b && a>c (iii) a==c|| b>a (iv) b>15 && c<0 || a>0

c) What is printed by the following program? 2

```
main()
{
int x=5, y=10, z=10;
x=y==z;
printf("%d",(x>y)?x:y);
}
```

d) List the advantages of using shorthand assignment operators. 2

4. a) What is the purpose of if-else statement? 2

b) How can you use for loops when the number of iteration are not known? 2

c) What will be the output of the segment when executed? 2

```
int a=10, b=5;
if(a>b)
{
if(b>5)
printf("%d",b)
}
else
printf("%d",a):
```

d) Write down the functions of break and continue statements. 2

e) Explain the basic differences between while and do-while loops 2

Section B

5. a) Which of the following prototype declarations are invalid? Why? 3
(i) int fun(int a, b);(ii) fun(int, float, char); (iii) void fun(void, void) (iv) void fun(int a, int&b);

b) Explain call by value and call by reference. 2

c) Describe recursive function with example. 3

d) What is the output of the following code? 2

```
int n=0, m=1;
do
{
printf(m);
m++;
}
while(m<=n);
```

6. a) Write a program to find the largest number form n inputted numbers, using the concept of dynamic memory allocation. 4

b) Identify errors, if any, in each of the following array declaration statements. 2
i) int score (100) ii) float values[10, 15] iii) float avg[row],[column] iv) char name[50]

c) How will you define a structure and assigning values to structure members? 2

d) What is the output of the following program? 2

```
main()
{
char string[]="Hello world";
int m;
for(m=0; string[m]!='\0'; m++)
if((m%2)==0)
printf("%c",string[m]);
}
```

7. a) Write a program to define a type named "**country**" with three members (i.e. **countryCode**, **countryName** and **countryArea**), using structure. Write a program to take input for two countries using the pointer variable and print them. 4

b) What is printed by the following program? 2

```
int m=100;
int *p1=&m;
int **p2=&p1;
printf("%d", **p2);
```

c) Distinguish between (*m)[5] and *m[5]. 2

d) Write down the result of the following code segment? 2

```
char s1[]="Dhaka";
char s2="Gopalgonj";
strncpy(s1,s2,3);
printf("%s",s1);
```

8. a) How pointer variable different from ordinary variable? 2

b) Write the output of the following code segment: 3

```
void main() {
inti;
 for(i=1; i<=3; i++)
 display();}
void display() {
 auto int p = 0;
static intq = 0;
p = q + 1;
 q = p +1;
printf("p = %d, q = %d \n", p, q);}
```

c) Write a program to read data from the keyboard, write it to a file called "Input", count how many words are there in that file and display the result on the output screen. 5