Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code:CSE-1101, **Course Title:** Computer Fundamentals Lab

Session: 2019-2020

Time: 3 Hours **Marks:** 60

NB: 1. Answer all the questions.
2. Figures in the right margin indicate marks.
3. All parts of a question must be answered serially.

1. (a) Describe the followings: 15
   i. Hardware & Software
   ii. Operating System
   iii. Microprocessor
   iv. Cache Memory
   v. Floppy disk

   (b) Write down some differences between RAM and ROM. 05

2. (a) Define Software. Write down some differences between Hardware and Software. 05

   (b) Describe the followings: 15
   i. System software
   ii. Application software
   iii. Function of Operating System
   iv. DOS, Windows & Mac
   v. I/O Devices

3. Convert the followings: 20
   i. $(DABCFAB)_{16} = (?)_8$
   ii. $(DEFBAC)_{16} = (?)_{10}$
   iii. $(1011111101101.1101\underline{10100})_2 = (?)_{10}$
   iv. $(85357652.98759)_{10} = (?)_2$

(11000 101100 111010001010100. 11111 ...)$_2$

00116110101011100111116101011

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Eng.) Final Exam-2020

Course Code: CSE-1102; **Session:** 2019-2020

Course Title: Structured Programming Language

Time: 3 Hours **Marks:** 60

NB: 1. Answer any **FOUR (4)** questions out of **SIX (6)** questions.
2. Figures in the right margin indicate marks (15*4=60).
3. All parts of a question must be answered serially.

1.	**(a)**	What is mean by structured programming? as a structured programming language write the main characteristic of c programming language.	**5**
	(b)	Write the modes of operation in the base of users.	**3**

	(c)	What is difference between the %e and the %E printf() format specifiers?
		What is wrong with this program? Write the solution.
		#include <stdio.h>
		int f1 (void);
		int main(void)
		{ Doble answer;
		Answer=f1();
		printf("%f", answer);
		return 0 ; }
		Int f1(void)
		{
		Return 100;
		}.
			3

	(d)	**What is a symbolic constant?** Identify & explain the purpose of the library function in the following expression i) Strlen("hello\0",'e') iv) exp(x) ii) Abs(i-2*j) v)pow(d1,d2) iii) Floor(x+y) vi) rstrlen()	**4**
2.	**(a)**	"C is considered as a Procedural Language"- Justify the statement.	**2**
	(b)	What are the rules for variable declaration C programming language.	**4**
	(c)	Differentiate between global and local variable in C with appropriate example.	**4**
	(d)	Write down a C program to calculate multiplication of two matrices.	**5**
3.	**(a)**	What is Data file? Describe the different types of data file that use in c and file type specifications with its meaning.	**4**
	(b)	What do know about function prototype? Show the prototype for a function called purge( ) that has no parameters and returns pointer to a double.	**5**

	(c)	What is wrong with this recursive function?
		
		void f (void)
		{
		int I;
		printf("in f() \n");
		/* call f() 10 times */
		for (i=0, i<10; i++)
		f();
		}
			3

	(d)	Write a program that create an input function similar to prompt() . have it input a string rather than an integer.	3
4.	(a)	Write a recursive function called rstrlen () that uses recursion to compute the length of a string. Demonstrate it in a program.	3

	(b)	What is the relationship between structure member and a structure?
		Is this program correct?
		#define STDIO <stdio.h>
		#include STDIO
		int main (void){
		printf("this is a test.");
		Return 0;
		}
			3

	(c)	How is a structure-type pointer variable declared? Write the basic idea behind a linked data structure.
		What is wrong with this fragment?
		struct {
		int i;
		char str[80];
		double balance;
		} svar;
		svar - > I = 100;
			5

	(d)	What is bit-field? Write a program that uses a union to convert an int into a long.	4
5.	(a)	Differentiate between call by value and call by reference in C programming language.	3
	(b)	Write down a C program to print Fibonacci series using recursion.	5
	(c)	Differentiate between static memory allocation and dynamic memory allocation.	3
	(d)	Write a program that counts the number of bytes in a file(text or binary) and displays the result. Have the user specify the file to count on the command line.	4
6.	(a)	What does strcmp() and strcat() do? Describe different types of array with examples.	5

	(b)	What is pointer? Why is the base type of pointer important ?
		Identify errors, if any then give the explanation, in each of the following statements
		#include<string.h>
		#include<stdio.h>
		int main (void)
		{
		char str[5];
		strcpy(str, "this is a test");
		printf(str);
		return 0;
		}
			4

	(c)	Write a program that reaptedly reads strings from the keyboard until the user enters quit.	3
	(d)	Rewrite the following array reference using pointer arithmetic . int count [100] [10]; count[44] [8] = 99;	3

printf ("WORld");
reversSentene();
}
reversSentenee ()
{ ~~printf~~ for(s=0; s<=15; s++)
{ printf ("%c",

#include <stdio.h>
includ <strlen.h>
reversSentene();
int main(void)
{ char s[5]

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: CSE-1103; **Session:** 2019-2020

Course Title: Structured Programing Language Lab

Time: 3 Hours **Marks:** 60

NB: 1. Answer specific **Two (2)** questions out of all questions.
2. Marks(20*2=40)+.(Viva 20) =60
3. All parts of a question must be answered serially.

1.	Write a C program to compute the sum of the two given integer values. If the two values are the same, then return triple their sum. 3 9 12 12 12 72
2.	Find the average of four given number by keyboard with C program.

3.	Write a C program to print a big 'C'.
	Expected Output:
	
	`  ######`
	`##  ##`
	`#`
	`#`
	`#`
	`#`
	`#`
	`##  ##`
	`  ######`

4.	Write a C program to compute the perimeter and area of a circle with a radius of 6 inches. *Expected Output*: Perimeter of the Circle = 37.680000 inches Area of the Circle = 113.040001 square inches
5.	Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches. and width of 5 inches. *Expected Output*: Perimeter of the rectangle = 24 inches Area of the rectangle = 35 square inches
6.	Write a C program to print the following characters in a reverse way. *Test Characters*: 'X', 'M', 'L' *Expected Output*: The reverse of XML is LMX
7.	Write a C program to convert specified days into years, weeks and days. Note: Ignore leap year. Test Data: Number of days : 1329 Expected Output : Years: 3 Weeks: 33 Days: 3

8.	Write a C program that accepts two integers from the user and calculate the sum of the two integers.
9.	Write a C program that accepts two item's weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items. Test Data : Weight - Item1: 15 No. of item1: 5 Weight - Item2: 25 No. of item2: 4 Expected Output: Average Value = 19.444444
10.	Write a C program that prints all even numbers between 1 and 50 (inclusive).
11.	Write a C program that accepts three integers and find the maximum of three.
12.	Write a program that converts Centigrade to Fahrenheit.
13.	Write a C program to check whether a given number is even or odd.
14.	Write a C program to check whether a given number is positive or negative. Test Data: 165 Expected Output: 165 is a positive number.
15.	Write a C program that reads three floating values and check if it is possible to make a triangle with them. Also calculate the perimeter of the triangle if the said values are valid. Input the first number: 25 Input the second number: 15 Input the third number: 35 Expected Output: Make triangle Perimeter = 75.0
16.	Write a C program that reads an integer between 1 and 12 and print the month of the year in English. Test Data: Input a number between 1 to 12 to get the month name: 8 Expected Output: August
17.	Write a C program to read the age of a candidate and determine whether it is eligible for casting his/her own vote in Bangladesh Test Data : 22 *Expected Output* : Congratulation! You are eligible for casting your vote.
18.	Write a C program to find whether a given year is a leap year or not. Test Data: 2016 Expected Output: 2016 is a leap year.
19.	Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies. Test Data: 7 9 Expected Output : The coordinate point (7,9) lies in the First quadrant.
20.	Write a C program to find the sum of first 10 natural numbers. Expected Output: The first 10 natural number is: 1 2 3 4 5 6 7 8 9 10 The Sum is : 55
21.	Write a C program to find the sum of first 100 natural numbers.
22.	Write a program in C to display n terms of natural number and their sum. Test Data: 8 Expected Output: The first 8 natural number is : 1 2 3 4 5 6 7 8 The sum of Natural Number upto 8 terms : 36

23.	Write a program in C to display the pattern like right angle triangle using an asterisk * * * * * * * * * *
24.	Write a program in C to display the pattern like right angle triangle with a number. 1 1 2 1 2 3 1 2 3 4
25.	Write a program in C to make such a pattern like right angle triangle with a number which will repeat a number in a row. 1 22 333 4444
26.	Write a program in C to make such a pattern like right angle triangle with a number which will repeat a number in a row. 1 3 3 5 5 5 7 7 7 7
27.	Write a program in C to make such a pattern like right angle triangle with number increased by 1. 1 2 3 4 5 6 7 8 9 10
28.	Write a program in C to display the pattern like angle triangle with a char. + + + + + + + + + +
29.	Write a program in C for addition of two Matrices of same size (3X3).
30.	Write a program in C for addition of two Matrices of same size. Expected Output : The First matrix is : 1 2 3 4 The Second matrix is : 5 6 7 8 The Addition of two matrix is : 6 8 10 12

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: EEE-1104; **Session:** 2019-2020

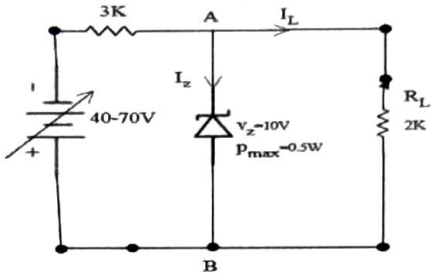
Course Title: Basic Electrical Engineering

Time: 3 Hours **Marks:** 60

NB: 1. Answer any **FOUR (4)** questions out of **SIX (6)** questions.
2. Figures in the right margin indicate marks(15*4=60).
3. All parts of a question must be answered serially.

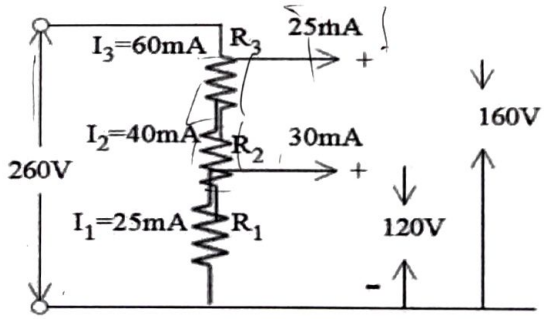
1. (a) State "Voltage Regulation Law" with its two cases. **05**

(b) Find the battery current I, I_z and I_L in the given circuit. How will these values be affected if source voltage increases to 70 V? **03**



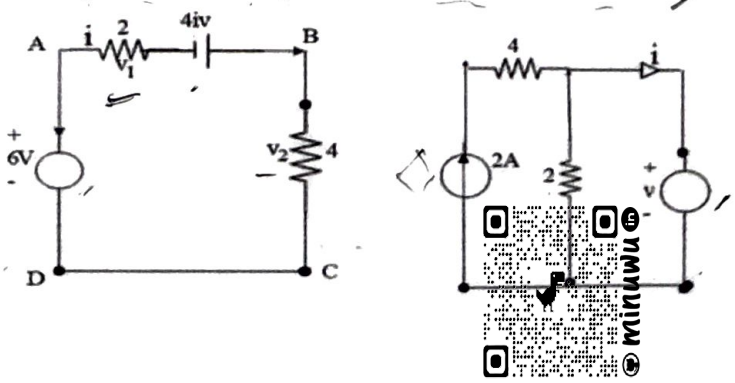
(c) 'Parallel circuit is called as multiple connections or shunt connections.' Describe the laws of parallel circuit. **03**

(d) A tapped voltage divider is to be connected across a 260V dc supply to provide outputs of (a) 25mA at 120V and (b) 30mA at 160V. Find the resistance of each section of the divider, its power dissipation and total resistance if the bleeder current passed by the divider is to 60mA. **04**



2. (a) State and prove Kirchhoff's Voltage Law with a simple example. **04**

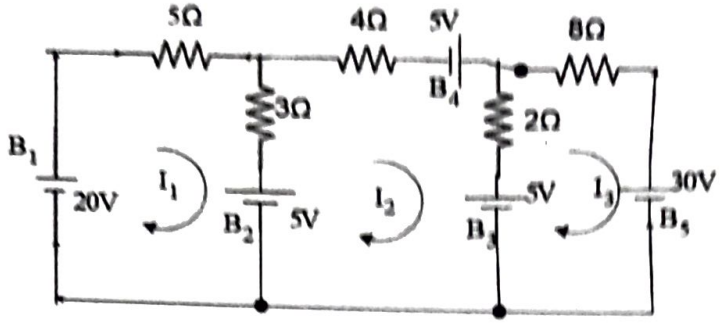
(b) Using Kirchhoff's voltage law, to find the values of current **I** and the voltage drops v_1 and v_2 in the given circuit, which contains a current-dependent voltage source, what is the voltage of the dependent source? [All resistance values are in ohms.] **02**



(c) Elaborate the process of conversion **Delta** network to **Star** network properly. 03

(d) How nodal analysis method is processes with current sources. 03

(e) Determine the current supplied by each battery in the circuit given below using mesh method. 03

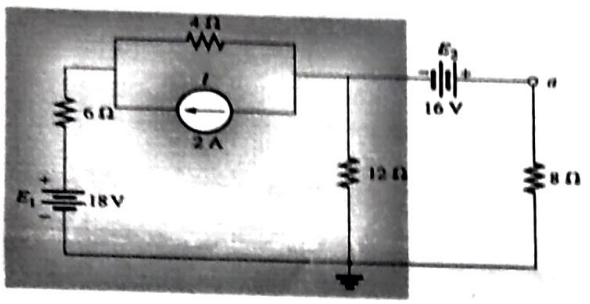


3. (a) For the given network: 06

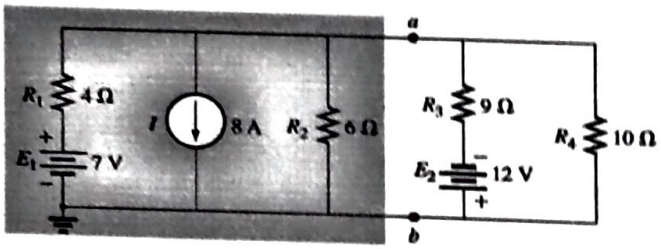
i. Find the Thévenin equivalent circuit for the portion of the network in the shaded area.

ii. Reconstruct the network of with the Thévenin equivalent network in place.

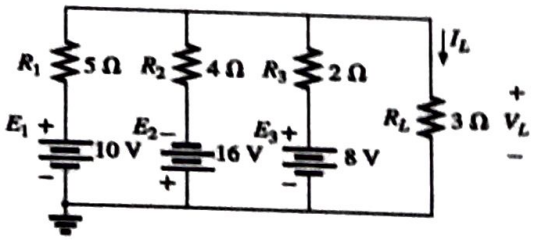
iii. Using the resulting network of part (b) find the voltage V_a.



(b) Find the Norton equivalent circuit for the portion of the network to the left of a-b in the given network. 05



(c) Using Millman's theorem, find the current through and voltage across the resistor R_L in the given figure. 04



4. (a) State **Faraday's law** of electromagnetic induction. 04

(b) What do you know about mutual inductance and stray inductance? 04

(c) Write about" the inductance in parallel without M mutual inductance 04

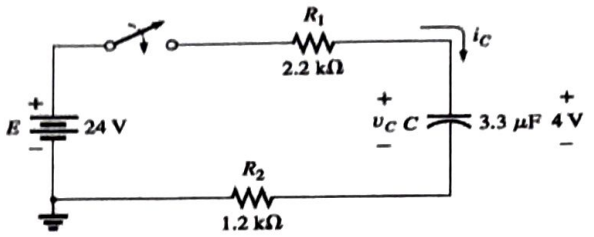
(d) An iron ring 30cm mean diameter is made of square of iron of 2cm × 2cm cross section and is uniformly wound with 400turns of wire of 2mm^2 cross section. Calculate the value of the self inductance of the coil. (Assume μ_r=800) **03**

5. (a) Describe the transients in capacitive networks (charging and discharging phases) and formulate the necessary equations with appropriate figures. **05**

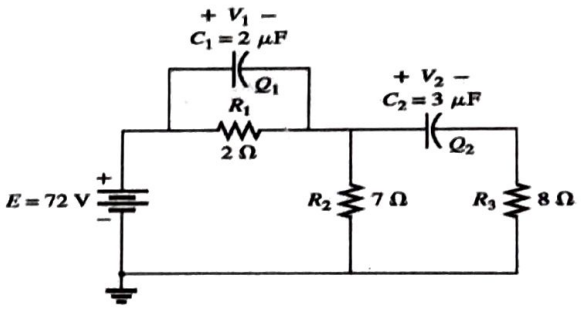
(b) The capacitor in the given figure has an initial voltage of 4 V. **05**

i. Find the mathematical expression for the voltage across the capacitor once the switch is closed.

ii. Find the mathematical expression for the current during the transient period.



(c) Find the voltage across and the charge on each capacitor of the network in the following figure after each has charged up to its final value. **05**



6. (a) Write about **Average** value and **R.M.S.** value. **02**

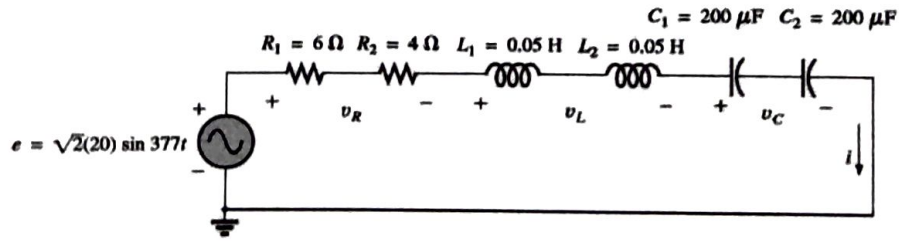
(b) Describe Phasor Diagram of RL,RC and RLC series circuits. **05**

(c) For the circuit given below: **06**

i. Calculate I, V_R, V_L, and V_C in phasor form

ii. Calculate the total power factor.

Calculate the average power delivered to the circuit.



(d) State Maximum Power Transfer theorem. **02**

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: Math-1106; **Session:** 2019-2020

Course Title: Calculus

Time: 3 Hours **Marks:** 60

NB: 1. Answer any **FOUR (4)** questions out of **SIX (6)** questions.
2. Figures in the right margin indicate marks(15*4=60).
3. All parts of a question must be answered serially.

1. (a) Mathematically define left hand limit of a function. Does $\lim_{x \to 0} \frac{1-\cos^3 x}{\tan^2 x}$ exists? Explain. **5**

(b) State Cauchy's necessary and sufficient condition for the existence of limit of a function. **2**

(c) A function $f(x)$ is defined in (0, 3) in the following way: **5**

$$f(x) = x^2 \text{ when } 0 < x < 1$$
$$= x \text{ when } 1 \le x < 2$$
$$= \frac{1}{4} x^3 \text{ when } 2 \le x < 3$$

Show that f(x) is discontinuous at x = 1 and x = 2

(d) Mathematically define continuity and discontinuity of a function with example. **3**

2. (a) Find the differential coefficients of: **6**

i) $\tan^{-1}\left(\sqrt{\frac{1-x}{1+x}}\right)$

ii) $(\sin x)^{\cos x} + (\cos x)^{\sin x}$

(b) Find y_n in the following case: **3**

y= sinx sin2x sin3x

(c) State and prove Leibnitz's theorem. **6**

3. (a) Find dy/dx for the following functions: **3*3**

$$i)\ x^p y^q = (x+y)^{(p+q)}$$

$$ii) y = \sin\{2\tan^{-1}\sqrt{\frac{1-x}{1+x}}\}$$

$$iii)\ y = \tan^{-1}\frac{\sqrt{1+x^2}-1}{x}$$

(b) Define maxima of a function. Show that the maximum value of $x + \frac{1}{x}$ is less than its minimum value. **3**

(c) Show that the minimum value of $\frac{x}{logx}$ is e. 3

4. Evaluate: 15

i) $\int(3\sin x\cos^2 x-\sin^3 x)dx$

ii) $\int\cos(2\cot^{-1}\sqrt{\frac{1-x}{1+x}})dx$

iii) $\int\log(x-\sqrt{(x^2-1)}dx$

5. (a) Define Beta and Gamma function. Find : 5

i) $\Gamma(\frac{5}{2})$

ii) $B(\frac{1}{4},\frac{3}{4})$

(b) Evaluate : 10

i) $\int_0^1 \frac{dx}{\sqrt{x\log\frac{1}{x}}}$ using gamma function

ii) $\int_0^{\pi/2}\sqrt{\tan\phi}d\phi$ using beta function

6. (a) State and prove Walli's formula. 5

(b) Define improper integral. Solve the improper integral: $\int_{-\infty}^{\infty}\frac{xdx}{x^4+1}$ 5

(c) If $I_n = \int_0^{\frac{\pi}{2}} x^n \sin x\,dx$ then show that $I_n + n(n-1)I_{n-2} = n(\frac{\pi}{2})^{n-1}$ and also find the value of $\int_0^{\frac{\pi}{2}} x^5\sin x dx$, that is I_5. 5

Rangamati Science and Technology University

Department of Computer Science and Engineering

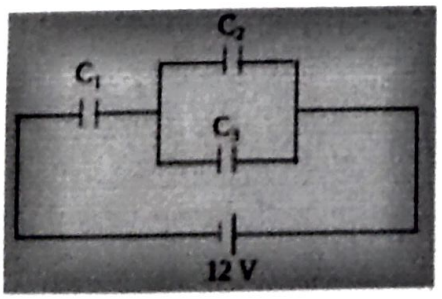
1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: PHY-1107; **Session:** 2019-2020

Course Title: Physics

Time: 3 Hours **Marks:** 60

NB: 1. Answer any **FOUR(4)** questions out of **SIX(6)**questions.
2. Figures in the right margin indicate marks(15*4=60).
3. All parts of a question must be answered serially.

1.	**(a)**	Write down the applications of Gauss Law. Distinguish between unipolar electric field and non-polar electric field.	**3+3=6**
	(b)	A large plane charge sheet having surface charge density $\sigma=2.0\times10^{-6}$ lies in the x-y plane. Find the flux of the electric field through a circular area of radius 1 cm lying completely in the region where x,y,z are all positive and with its normal making an angel of 60° with the z-axis.	**4**
	(c)	A particle of mass 5.0×10^{-6} g is kept over a large horizontal sheet of charge of density 4.0×10^{-6} cm^{-2}. Calculate the amount of charge should be given to this particle so that if released, it doesn't fall down. Also calculate the number of electrons are to be removed to give this charge. Do you think the mass will be decreased due to the removal of these electrons? If yes, then find the decreased mass.	**5**
2.	**(a)**	Write down the conditions for Interference. Derive a relation between path difference and phase difference.	**4**
	(b)	Establish the expression of phase difference for both constructive and destructive interference.	**6**
	(c)	A viewing screen is separated from a double slit source by 1.2 m. The distance between two slits is 0.030mm. The second order bright fringe is 4.5cm from the center line. Calculate the distance between adjacent bright fringes.	**5**
3.	**(a)**	Derive the equation between potential difference and intensity.	**4**
	(b)	Write short note on: I. Dielectric II. Electric Potential III. Newton's Ring	**6**
	(c)	C1=3 μF, C2=4 μF,C3=3 μF, are connected in series and parallel. Determine the electric energy on the circuit. 	**5**

4.	**(a)**	Define self induction and mutual induction. Distinguish between step-up transformers and step-down transformers.	**5**
	(b)	<table><tr><th>Transformer</th><th>N_p</th><th>N_s</th><th>V_p</th><th>V_s</th><th>I_p</th><th>I_s</th></tr><tr><td>1</td><td>1000</td><td></td><td>120</td><td>12</td><td>0.4</td><td>2</td></tr><tr><td>2</td><td>80</td><td>8</td><td>20</td><td>2</td><td></td><td>2.5</td></tr></table> Based on the above table, if the efficiency of both transformers is the same,50%, determine Ns and Ip.	**10**
5.	**(a)**	Explain plane of polarization and plane of vibration.	**4**
	(b)	State Brewster's Law. Show that at the polarizing angle of incidence, the reflected and refracted rays are mutually perpendicular to each other.	**7**
	(c)	The refractive index for glass is 1.52. Calculate its polarizing angle and angle of refraction for a ray of light incident.	**4**
6.	**(a)**	Distinguish the main features of diamagnetic, paramagnetic and ferromagnetic substances.	**5**
	(b)	Derive Coulomb's law from Gauss's law.	**5**
	(c)	Two parallel plates of area 20 cm^2 each are separated by a distance of 10 mm. If one plate carries a charge $+2\times10^{-9}$ C and the other carries a charge -2×10^{-9} C. Calculate the electric field in the space between them.	**5**

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: PHY-1108; **Session:** 2019-2020

Course Title: Physics Lab

Time: 3 Hours **Marks:** 60

NB: 1. Answer all the questions.
2. Figures in the right margin indicate marks.
3. All parts of a question must be answered serially.

1. Describe the followings: 20
   i. Post Office Box
   ii. Galvanometer
   iii. Thermocouple
   iv. Time period of oscillations of a helical spring
   v. Ratio of e.m.f of two cells

2. a) Deduce the equation from which spring constant can be calculated. 15
   b) Write down the equation from which moment of inertia can be calculated.
   c) Write down the equation for determination of modulus of rigidity.

3. a) Write the experiment name/names where Jolly's thermometer and Hg – Barometer are used. Also write down the functions of those instruments in that experiment/s. 20
   b) Write the experiment name/names where Lee's and Chorlton's instrument is used. Also write down the functions of this instrument in that experiment/s.

4. Define Bad Conductor. Write down the equation from which you can determine the thermal conductivity of a bad conductor. 05

Rangamati Science and Technology University

Department of Computer Science and Engineering

1st Year 1st Semester B.Sc. (Engg.) Final Exam-2020

Course Code: Eng-1109; **Session:** 2019-2020

Course Title: English

Time: 3 Hours **Marks:** 60

NB: 1. Answer any **FOUR (4)** questions out of **SIX (6)** questions.
2. Figures in the right margin indicate marks (15*4=60).
3. All parts of a question must be answered serially.

1. (a) A job application for employment is a standard business document that is prepared with questions deemed relevant by employers. It is used to determine the best candidate to fill a specific role within the company. Now write a **job application and CV** for a private company in Dhaka. **10**

(b) What are the important things for a formal power point presentation? Briefly discuss the points on your opinion. **5**

2. (a) Many researchers, engineers and environmentalists are expressing deep concerns about changes in the overall climate of the planet. Fossil fuels are being continuously used to produce electricity. The burning of these fuels produces gases like carbon dioxide, methane and nitrous oxides which lead to global warming. Deforestation is also leading to warmer temperatures. **10**

Now, write a **report** with a title on Global Warming: Causes, Effects and Solutions.

(b) Make a short review on a novel named "Mother" written by Maxim Gorky. **5**

3. (a) Write down at least two synonyms for each of the following word. [**any five**] **5**

Delicious, Fear, Mischievous, Spectators, Quarantine, Pacify, Baffle

(b) Make five meaningful sentences with meaning from the following words. [**any five**] **5**

Quixotic, Jejune, Cupidity, Paragon, Parvenu, Arrant, Affluent

(c) Write down at least two opposites word for each of the following word. [**any five**] **5**

Probably, Protect, Annoy, Swift, Comedy, Hopeful, Awful

4. (a) It's easy to feel overwhelmed by everything you're hearing about coronavirus disease 2019 (COVID-19) right now. It's also understandable if your children are feeling anxious, too. Children might find it difficult to understand what they are seeing online or on TV – or hearing from other people – so they can be particularly vulnerable to feelings of anxiety, stress and sadness. But having an open, supportive discussion with your children can help them understand, cope and even make a positive contribution for others. **10**
Now Write a dialogue between you and your children regarding coronavirus disease 2019 (COVID-19).

(b) Write a short note on how you have developed yourself during pandemic. **5**

5. **(a)** Write a paragraph on "**The Church**" with 150 words. **10**

(b) Write an E-mail to your best school friend describing a nostalgic and memorable day that once you passed together. **5**

6. **(a)** Write a **Composition** with relevant dispute. [**any one**] **15**

I. Democracy and Secularism
II. Media and Communication