Affiliated Engineering College
University of Dhaka
1st Year 1st Semester Examination 2020
Department: Electrical and Electronic Engineering
Course Code: EEE 1101 Course Title: Electrical Circuit-I

Time : 2 hours Full marks: $14 \times 3 = 42$

Answer any **3** (**Three**) questions.

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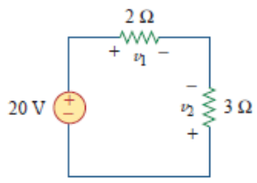
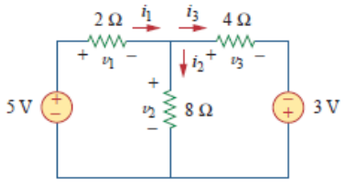
1 (a) Define voltage, current, power and energy. 2

(b) For the following circuit; find v_1, v_2, i_1, i_2, I and P. 4



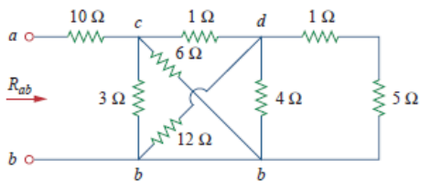
(c) Write the statements of KVL and KCL. 3

(d) Find the current and voltages in the following circuit. 5

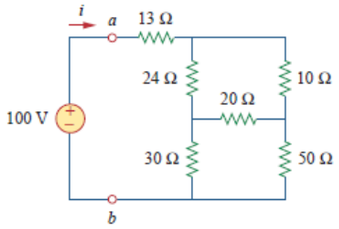


2 (a) Describe the equivalent resistance of two parallel resistors and current divider rules. 5

(b) Calculate the equivalent resistance R_{ab} in the circuit. 4

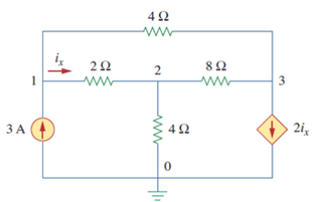


(c) For the following bridge network find R_{ab} and i. 5

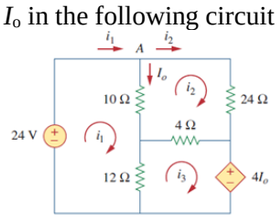


3 (a) What is super node and super mesh? Write some steps to determine node voltage. 4

(b) Determine the voltage at the nodes 5

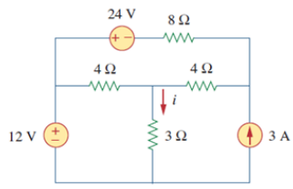


(c) Use mesh analysis to find the current I_o in the following circuit 5

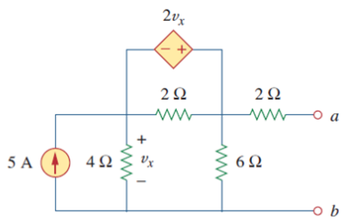


4 (a) What is superposition theorem? Write some steps to apply superposition principle. 3

(b) For this circuit use the superposition theorem to find i. 5



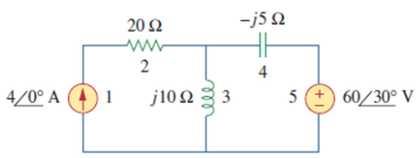
(c) Find the Thevenin equivalent of the following circuit at terminal a-b. 6



5 (a) Define instantaneous and average power. 2

(b) Derive the maximum average power transfer theorem. 6

(c) Determine the average power generated by each source and the average power absorbed by each passive element in the following circuit. 6



University of Dhaka, Affiliated Engineering Colleges

1st Year 1st Semester Examination 2020, Department of Electrical and Electronic Engineering

PHY 1101: Electricity and Magnetism, Modern Physics and mechanics.

Time: 2.00 hours Marks: 42

Answer any 3(**Three**) question

1.	(a)	Explain Coulomb's law of electrostatics in general and vector form.	3
	(b)	What is point charge? Find the equation of potential due to a point charge?	7
	(c)	A disc has a radius R of 2.5cm and a surface charge density +5.89 μC/m^2 of its upper face. Calculate the electric field at a point on the central axis at (i) a distance x = 12cm from the disk and (ii) the electric field at the surface of the disk.	4
2.	(a)	State and prove Gauss Theorem.	7
	(b)	Two-point charges q_1 & q_2 are 5m apart and their combined charge is $20\mu c$. What is the magnitude of the two charges if (a) One repels the other with a force of 0.075N (b) attracts the other with a force of 0.525N?	3
	(c)	What is capacitance? Two capacitor have a capacity of 5 μF when connected in parallel and 1.2 μF when connected in series. Calculate their individual capacitance.	4
3.	(a)	State Kirchhoff's law & apply it to a Wheatstone bridge & find the condition for balance:	5
	(b)	Find the expression for current, *i*, in RC circuit for a constant emf ε at any instant.	5
	(c)	Define self and mutual inductance. State Biot-Savart law.	4
4.	(a)	Define Nuclear fission, photoelectric effect, Nuclear binding energy.	3
	(b)	Establish Einstein's mass energy relation.	7
	(c)	Calculate the threshold wave length for tungsten surface whose work function is 4.5 eV?	4
5.	(a)	Define radioactivity. State and explain Radioactive decay law.	6
	(b)	Compare the properties of radioactive particles	4
	(c)	The half-life of radium is 1620 years. In how many years will one gram of pure element (i) lose 10 centigram (ii) be reduced to 10 centigram?	4

University of Dhaka, Affiliated Engineering Colleges
Department of Electrical and Electronic Engineering (EEE)
1st Year 1st Semester Examination -2020 (Session: 2019-2020)

Course Code: GED 1101 Total Mark: 42
Course Title: English for Technical Communication Time: 2.00 Hours

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Part-A (Comprehension): 14 Marks

Read the following passage carefully and answer the questions afterwards:

The Internet is the global system of interconnected computer networks that uses the Internet protocol suite to communicate between networks and devices. It is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents and applications of the WWW, electronic mail, telephony, and file sharing.

Most traditional communication media, including telephony, radio, television, paper mail and newspapers are reshaped, redefined, or even bypassed by the Internet, giving birth to new services such as email, Internet telephony, Internet television, online music, digital newspapers, and video streaming websites. Newspaper, book, and other print publishing are adapting to website technology, web feeds and online news aggregators. The Internet has enabled and accelerated new forms of personal interactions through instant messaging, Internet forums, and social networking services. Online shopping has grown exponentially for major retailers, small businesses, and entrepreneurs, as it enables firms to extend their "brick and mortar" presence to serve a larger market or even sell goods and services entirely online. In fact, Internet has become part and parcel of modern life.

1 a) What is Internet? 5

b) What do you know about WWW?

c) What does the phrase "brick and mortar" refer to?

d) Mention some of the functions of Internet.

e) How does the institutes teach morality to the younger generation?

2. Write the contextual meaning of the following words in English and make sentence with them. 5

(i) Irrespective, (ii) Infuse, (iii) Symposium, (iv) Appreciation (v) Uplift

3. Write a precise of the above passage. 4

Part -B (Grammar): 14 Marks

4. Write right form of verbs: 5
   i. The Examiners made us (to show) our identification in order to admit to the exam center.
   ii. Sadia (to sleep) for five hours and is still sleeping.
   iii. She (to get) promotion recently.
   iv. It's time you (to realize) your mistake.
   v. We look forward to (to receive) a response from you.

5. Transform the following sentences as directed. 5
   (a) The baby burst into tears when it saw its mother. (Make it Simple)
   (b) It was a very interesting story. (Make it Exclamatory)
   (c) Tell me where you live (Simple).
   (d) Dickens is more popular than Hardy. (Make it Positive Degree).
   (e) The teacher punished the boy for his disobedience (Compound).

6. Correct the following sentences: 4
   i. Every students like the teacher.
   ii. Where I can find a library?
   iii. The Engineering College campus is not enough big.
   iv. Do you like a glass of papaya juice?

Part- C (Writing): 14 Marks

7. Write an essay on "The effect of Engineering Education on the socio-economic condition of the country". 7

8. Write a paragraph on "Corruption". 7

Or

Write an application to the principal of your college for Wi-Fi connection in your college.

Affiliated Engineering College, University of Dhaka
1st Year 1st Semester Final Examination 2020
Department: Electrical and Electronic Engineering
Course Code: CSE 1101 Course Title: Computer Programming

Time : 2 hours Full marks: $14 \times 3 = 42$

Answer any **5** (**Five**) questions.

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1 (a) Define algorithm and flowchart. Write down the characteristics of a good quality algorithm. 5
(b) What is relational operator? Explain "=" and "= =" operators with example. 3
(c) What is operator precedence and associativity? State the necessity of it. 3
(d) Is the following code fragment valid? What will be the output if so? State your reason. 3

```
int a=2, b=5, c; c=(a++)+(++b); printf ("%d%d%d", a, b, c);
```

2 (a) Differentiate between class and structure. Explain the syntax for defining a class with example. 6
(b) Explain the visibility of base class members for the access specifiers: public while creating the derived class and also explain the syntax for creating derived class. 4
(c) What is keyboard? List the rules for naming a variable in C. 1+3

3 (a) What is function prototype in C? Write a program by using Call by Value idea. 5
(b) What is function in C? Explain how to declare a function with example. 4
(c) Write a program to find the grade according to the following rules using switch statement. 5

Marks	Grade
80-100	A+
70-79	A
60-69	B
0-59	F

4 (a) What is an array? Explain the declaration and initialization of one and two dimensional arrays with example. 1+4
(b) Write a program in C to find the area and perimeter of a circle. 4
(c) Write down any 5 character functions reside in ctype.h header file with description and appropriate example. 5

5 (a) Design and develop a C program to read a year as an input and find whether it is leap year or not. Also consider the end of the century. 5
(b) What is s structure? Explain the syntax of structure declaration with example 5
(c) Distinguish between a variable and constant. 4

Affiliated Engineering College, University of Dhaka
1st Year 1st Semester Examination 2020
Department: Electrical and Electronic Engineering
Course Code: Math 1101
Course Title: Differential and Integral Calculus and Co-ordinate Geometry

Time : 2 hours | Full marks: $14 \times 3 = 42$

Answer any **3** (**Three**) questions

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1 (a) A function f(x) is defined in (0, 3) in the following way: 4

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

show that f(x) is continuous at x=1 and x=2.

(b) If $f(x)=\begin{cases} 3+2x \text{ for } -3/2 < x \le 0 \\ 3-2x \text{ for } 0 < x \le 3/2 \end{cases}$ 5

Show that f(x) is continuous at x=0 but $f'(0)$ does not exist.

(c) If $y = (\sin^{-1} x)^2$ then show that $(1-x^2)y_{n+2}-(2n+1)xy_{n+1}-n^2y_n=0$ 5

2 (a) Evaluate (i) $\lim_{x\to 0}(\cos x)^{(\cot x)^2}$ (ii) $\lim_{x\to 0}\left(\frac{\tan x}{x}\right)^{1/2}$. 6

(b) State and prove Leibnitz's theorem. 8

3 (a) If $I_n = \int_0^{\pi/4} \tan^4 x dx$ then prove that $I_n+I_{n-2} = \frac{1}{n-1}$ and from this integral find the value of $\int_0^{\pi/4} \tan^5 x dx$. 5

(b) Write the definition of Beta function and Gamma function. Show that $\beta(m,n) = \frac{\Gamma m\, \Gamma n}{\Gamma(m+n)}$. 1+4

(c) Find the area created by the loop $3ay^2 = x(x-a)^2$. 4

4 (a) Determine the area length of the parabola $y^2=4ax$, extended from its apex to one end of its latus rectum. 5

(b) Find the surface area of the solid body generated by the revolution of the asteroid $x^{2/3}+y^{2/3}=a^{2/3}$ around y axis. 5

(c) Find the Value of $\iint_R (y+1)dA$ where R is a region bounded by y=sinx and y=cosx, $0 \le x \le \frac{\pi}{4}$. 4

5 (a) State and prove fundamental theorem of integral Calculus. 5

(b) Find the value of the integral $\int_0^{\pi} x\cos^4 x dx$. 4

(c) What is convergent and divergent of an integral? Test convergence and divergence of the following integral 1+2+2

(i) $\int_0^3 \frac{dx}{(3-x)^2}$ (ii) $\int_0^1 \frac{\ln x}{\sqrt{x}} dx$