

International Islamic University Chittagong
Department of Computer Science and Engineering

Mid Term Examination, Autumn-2023

Course Code: EEE-1121

Time: 1 hour 30 minutes

Program: B.Sc. Engineering in CSE

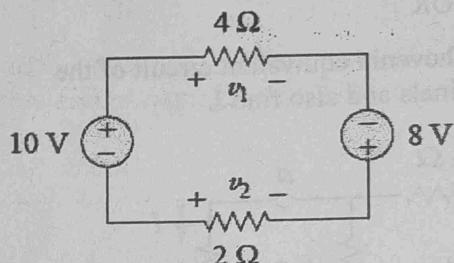
Course Title: Basic Electrical Engineering

Full Marks: 30

[Answer all the questions from the followings. Figures in the right margin indicate full marks]
Course Outcomes (COs) and Blooms Levels are mentioned in additional columns.

Marks

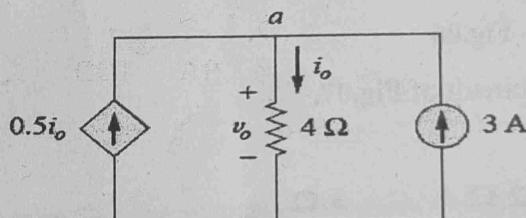
- 1) a) Explain ohm's law and Find V_1 & V_2 and in the circuit of Fig.01.



CO1 Ap 5

Fig.01

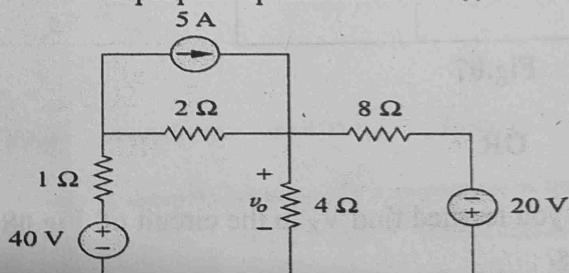
- 1) b) Explain KCL and Find current i_O and voltage v_O in the circuit shown in Fig.02.



CO1 AP 5

Fig.02

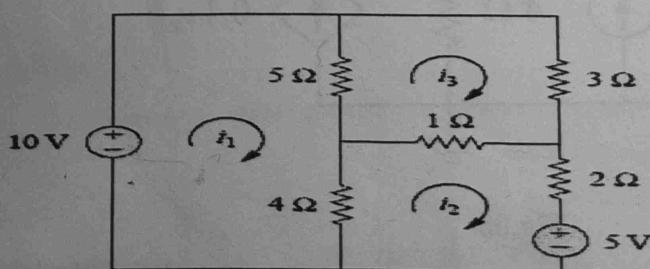
- 2) a) What type of circuit analysis do you think you should use to find V_o in the circuit of Fig. 03 also with proper explanation find v_o .



CO2 E 5

Fig.03

- 2) b) Using mesh analysis find i_1 , i_2 and i_3 from the circuit of Fig.04.



CO2 An 5

Fig. 04

- 3) a) Explain source transformation and using source transformation determine the current and power in the resistor 8Ω from Fig.05

CO2 E 5

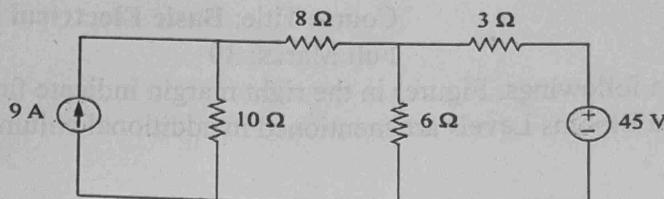


Fig.05
OR

- 3) a) State Thevenin's Theorem. Find the Thevenin equivalent circuit of the circuit in Fig.06 to the left of the terminals and also find I.

CO2 E 5

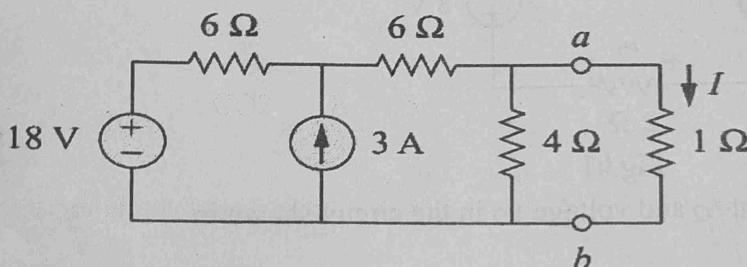


Fig.06

- 3) b) Use superposition to find V_0 in the circuit of Fig.07.

CO2 Ap 5

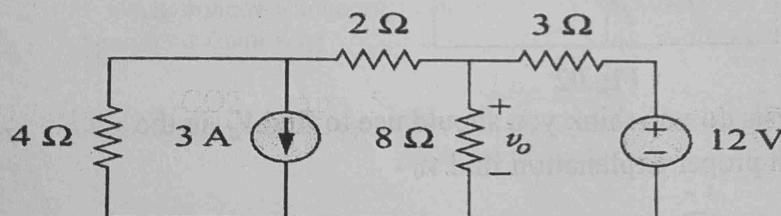


Fig.07

OR

- 3) b) Using any of the circuit theorem you learned find V_x in the circuit of Fig.08 also explain the theorem in details.

CO2 Ap 5

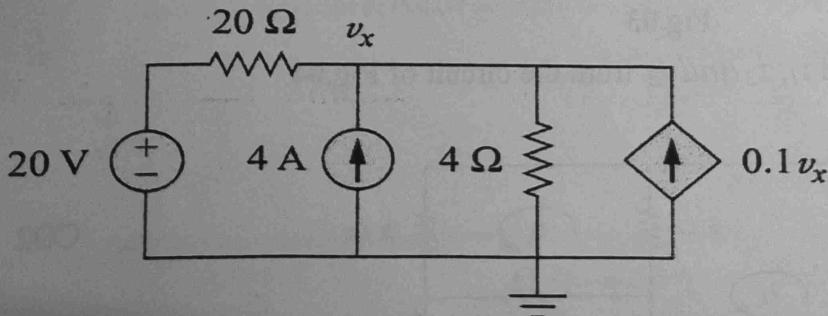


Fig.08

(i) The figures in the right-hand margin indicate full marks

(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

Course Outcomes (COs) of the Questions

CO1	Understand the basic knowledge of mechanics, optics and thermodynamics in the context of engineering.
CO2	Apply mathematical knowledge of mechanics, optics and thermodynamics to formulate and solve basic engineering problems.

Bloom's Levels of the Questions

Letter Symbols	R	U	App	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1. a) Define center of mass and moment of inertia. CO1 R 2
 b) Find the expression for the rotational kinetic energy of a rotating body. CO1 U 5
 c) A circular disc of mass 100 grams and radius 10 cm is making 120 rpm about an axis passing through its centre and perpendicular to its plane, Calculate its kinetic energy. CO2 An 3
2. a) What is gravitational potential? CO1 R 1
 b) Derive an expression for gravitational potential due to spherical shell at a point outside shell. CO1 U 6
- Or**
- State and prove the theorem of perpendicular and parallel axes in momentum of inertia.
- c) If an object of mass 5 kg is situated at a distance 100 cm from the center of a sphere of radius 110 cm. Determine the value of gravitational potential.
- Or**
- Calculate the gravitational force of attraction between two metal spheres each of mass 90 kg, if the distance between their centres is 40 cm. Given $G = 6.67 \times 10^{-11} \text{ N m}^2/\text{kg}^2$. Will the force of attraction be different if the same bodies are taken on the moon, their separation remaining the same. CO2 An 3
3. a) What is Wave Function? CO1 R 1
 b) Derive an expression of time independent Schrodinger wave equation. CO1 U 6
 c) An electron has a speed of $2 \times 10^4 \text{ cm/Sec}$ accurate to 0.01%. With what fundamental accuracy can we locate the position of this electron? CO2 An 3



International Islamic University Chittagong (IIUC)
Department of Computer Science and Engineering (CSE)
Mid Term Examination

Program: B. Sc. in CSE

Course Code: MATH-1107

Time: 1:30 hours

Semester: Autumn-2023

Course Title: Mathematics-I

Total Marks: 30

- (i) Answer all the questions. The figures in the right-hand margin indicate full marks.
- (ii) Please answer the several parts of a question sequentially.
- (iii) Course Learning Outcomes (CLOs) and Bloom's Levels are mentioned in additional Columns.

Course Learning Outcomes (CLOs) of the Questions

CLO1:	Compute the functions, limit and continuity of a function, derivatives, integrals and extrema of single-variable and/or multivariable functions.
CLO2:	Understand the techniques of differentiation and integration.

Bloom's Taxonomy Domain Levels of the Questions

Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

- | | | Marks | CLOs | DLs |
|---|--|-------|------|-----|
| I. | a) Obtain the Maclaurin's series generated by the function $f(x) = \cos x$ | 2 | CLO1 | U |
| b) Find the domain and range of the function,
$f(x) = x+2 + x-2 $ | | 2 | CLO1 | U |
| c) Test the differentiability of the following function at $x = 0$ | | 3 | CLO1 | U |

$$f(x) = 3 + 2x; -\frac{3}{2} \leq x < 0$$

$$= 3 - 2x; 0 \leq x \leq \frac{3}{2}$$

$$= -3 - 2x; x \geq \frac{3}{2}$$

Or

Test the differentiability of the following function at $x = \frac{\pi}{2}$

$$f(x) = 1; x < 0$$

$$= 1 + \sin x; 0 \leq x < \frac{\pi}{2}$$

$$= 2 + \left(x - \frac{\pi}{2}\right)^2; x \geq \frac{\pi}{2}$$

- d) Evaluate the limit using L'Hospital's rule $\lim_{x \rightarrow 0} \left(\frac{1}{x}\right)^{\tan x}$ 3 CLO1 U
 Or
 Differentiate $\tan^{-1} \frac{\sqrt{1+x^2}-1}{x}$ with respect to $\sec^{-1} \frac{1}{2x^2-1}$
2. a) Find the differential co-efficient of e^x by the first principle method. 3 CLO2 U
 b) Find the differential co-efficient of the following function $y = x^{\cos^{-1} x}$ 2 CLO2 U
 c) If $C = 1 + r \cos \theta + \frac{r^2 \cos 2\theta}{2!} + \frac{r^3 \cos 3\theta}{3!} + \dots$,
 $S = r \sin \theta + \frac{r^2 \sin 2\theta}{2!} + \frac{r^3 \sin 3\theta}{3!} + \dots$
 Prove that $C \frac{dC}{dr} + S \frac{dS}{dr} = (C^2 + S^2) \cos \theta$
3. a) If $y = e^{a \sin^{-1} x}$ then prove that 6 CLO2 App
 i. $(1 - x^2)y_2 - xy_1 - a^2 y = 0$
 ii. $(1 - x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2 + a^2)y_n = 0$
- b) State Rolle's theorem. Verify the Roll's theorem for the function 4 CLO2 R&U
 $f(x) = x^2 - 3x + 2$ in the interval $(1, 2)$
 Or
 State Mean Value theorem. Verify Mean Value theorem for the function $f(x) = \frac{x^3}{4} + 1$ over the interval $[0, 2]$. CLO2 R&U

x=5 y=2

International Islamic University Chittagong

Department of Computer Science & Engineering

B.Sc. in CSE, Mid Term Examination, Autumn 2023

Course Code: CSE-1121

Total Marks: 30

Course Title: Computer Programming 1

Time: 1 Hour 30 Minutes

[Answer all the following Questions. Figures in the right-hand margin indicate full marks]

- 1(a) Consider the following code segment:

2

```
int x = 2147483649;  
printf("x = %d\n", x);
```

(i) Will the above code segment show the correct output? If not, what should be done here? Remember, you can use maximum 32-bit wide variables.

(ii) What is the drawback of the code segment you've written for the previous question?

- 1(b) You are given N number of integer values; count the number of 5 or 3s in the list.

2

OR

Write a program to display whether the year is leap year or not. Given the year by the user. (We say that a year is a leap year if it is evenly divisible by 400 or if it is evenly divisible by 4 but not by 100).

- 1(c) Find the output of the following code segments:

2

[Replace X with the second last digit of your ID, and Y with the last digit of your ID. For example, if your ID be C161026, then X = 2, Y = 6]

(i) int a = 39;
int b = Y;
int c = -a;
int d = -b;
printf("%d %d %d %d", a % b, c % b, c % d, a % d);

(ii) double a = -X.7;
double b = fabs(floor(a));
printf("%lf", b);

(iii) int e, c = 5, d = -10, a = X, b = Y;
e = c++ - -d * b / a;
printf("%d", e);

(iv) int a = X.5 + Y.5;
printf("Z = %d\n", a);

- 1(d) Write a program to compute the real roots of a quadratic equation $ax^2+bx+c=0$

The roots are given by the equations:

$$X_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$X_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

The program should request for the values of the constants a, b and c and print the values of x_1 and x_2 .

Use the following rules:

- (i) No solution, if both a and b are zero.
- (ii) There is only one root, if $a = 0$ ($x = -c/b$).
- (iii) There are no real roots, if $b^2 - 4ac$ is negative.
- (iv) Otherwise there are two real roots ($b^2 - 4ac \geq 0$).

Test your program with appropriate data so that all logical paths are working as per your design.

Incorporate appropriate output messages.

2(a) `int a = 5;
int b = XY; // Here XY is the last two digits of your ID
if (n > 0)
 if (n == 7)
 a /= 9, b += 2;
else
 a *= 3; b -= 5;
printf("a = %d b = %d", a, b);`

What will be the values of *a* and *b* if *n* assumes a value of

- (i) 7
- (ii) 4
- (iii) 0

Explain with rough calculations.

- 2(b) Write a C program that will take a positive integer N as input, and produce output as described below: 3
- (i) If N is a multiple of 2, print **TWO**.
 - (ii) If N is a multiple of 5, print **FIVE**.
 - (iii) If N is a multiple of both 2 and 5, print **BOTH**.

Sample Input	Sample Output
4	TWO
15	FIVE
20	BOTH

- 2(c) The Kingsman is recruiting agents. There are 3 candidates left, named **Cruise**, **Eggsy**, and **Bond**. Only 4 one of them can join the Kingsman. The tallest candidate with the maximum IQ can join the force. You're given the heights (cm) of the remaining 3 candidates in the aforementioned order in the first line. The second line contains their IQ in the same order. Print the name of the person who is joining the Kingsman. If neither of the candidates can join, print **NONE**.
[All the inputs are integers. To join the force, a candidate must have a minimum 160 cm, and a minimum IQ of 82.]

Sample Input	Sample Output
150 165 170 75 85 80	Eggsy
150 165 170 75 80 80	None

OR

You have gone to a shop for buying a product, suppose A. Price of the product and quantity of the products you want to buy are known. That shop will give you **10%** discount if the cost is more than **1000**. That shop will give **30%** discount if the cost will be more than **5000**.

Now write a program where input will be price of product A is P and quantity of product A is Q. Determine the final cost of the products.

Sample Input	Sample Output
500 3	1350
550 11	4235
400 2	800

- 3(a) Write the outputs of the following code segments:
 [Replace X with the second last digit of your ID, and Y with the last digit of your ID. For example, if your ID be C161026, then X = 2, Y = 6]

(i)	<code>int n = X; while (--n) { printf("%d\n", n); }</code>	(ii)	<code>int n = Y; do { printf("%d\n", n); } while (--n);</code>	(iii)	<code>int n = XY; for (; ;) { printf("%d\n", n); }</code>
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- 3(b) Write a C program using switch statement to input mark of one subject Computer. Calculate the grade according to following:

Marks ≥ 90 : Grade A

Marks ≥ 80 : Grade B

Marks ≥ 70 : Grade C

Marks ≥ 60 : Grade D

Marks ≥ 40 : Grade E

Marks < 40 : Grade F

Sample Input	Sample output
92	Grade A
55	Grade E
35	Grade F

- 3(c) Print first N terms of a series called **Strabonacci** [$N > 3$]

In **Strabonacci** the first three terms are 1. Each of the next terms is the summation of the previous three terms.

A positive integer N is given, where $3 < N \leq 20$.

Sample Input	Sample output
7	1 1 1 3 5 9 17
5	1 1 1 3 5

Don't use array to solve this problem.

OR

Write a C program that will take a positive integer number with N digits and determine -

- i. The sum of the digits of the input number.
- ii. The mean of the digits of the number.
- iii. The number of even digits in the input number.

Sample Input	Sample output
4 1254	Sum of digits: 12 Mean: 3 Number of even digit: 2
5 25422	Sum of digits: 15 Mean: 3 Number of even digit: 4

International Islamic University Chittagong

Morality Development Program (MDP)

Midterm Examination, Autumn– 2023

Course Title: Tajweedul Quran-I

Course Code: MDP-1101, 1st Semester

Full Marks : 30

Time :1.30

Answer the following questions: $3 \times 10 = 30$

Q.1	<p>Write the meaning of the following terms:</p> <p>a.Tajweed b. Tarteel c. Tanween d. Tashdid e. Harakah f. Bas-malah g. Al-halq h.Makhraj i.Gunnah j.Al-Jawf.</p>	$10 \times 1 = 10$
Q.2	<p>Write the meaning of Suratun Naas and Suratul Ikhlas.</p>	$5 \times 2 = 10$
Q.3	<p>Write the Makhraj of the following letters:</p> <p>ل - ف - ع - ي - ط - ق - ك - خ - ن - ز</p> <p>Or</p> <p>Define “Madd” and explain the types of Madd with example.</p>	10

International Islamic University Chittagong

Centre for General Education (CGED)

Mid-term Examination Autumn-2023

Course Code: UREL-1106

Course Title: Advanced English

Time: 1 Hour & 30 Minutes Full Marks 30 (Written-25+Speaking-05)

Section-A: Reading Part

Read the following passage carefully and answer the questions.

Thousands of bees live in a hive. There are three types of bee in a hive. They are the Queen bee, the drones and the workers. The Queen is the head of the colony of bees. She doesn't command them, but she is essential to the life of the colony. She keeps its members together. She also lays eggs that produce the future members of the colony.

The drones are the males of the colony. The name drone has come to mean a lazy person, because the drones of a colony of bees do not take part in the work of the hive; but the life of the colony could not continue without them. They are not numerous in comparison with the total population of the family of bees, and they live for only three months, but in that time they perform the essential function of fertilizing the eggs of the Queen bee by mating with her. Fertilized eggs produce worker bees. Unfertilized eggs produce drones, a very small number in the entire family.

The worker bees carry out all the work of the colony. Wild bees build their homes in the hollows of the trees. Colonies of bees also live in hives that men provide for them. They fly out into forests, fields and gardens to gather nectar from flowers. They take the nectar back to the hive. There it is made into honey and stored in cells as food for the winter. As they fly from flower to flower, they carry with them pollen that clings to their bodies and legs. (This pollen fertilizes the blossoms that will later become fruit) The worker bees bring water to the hive. They ventilate the hive and protect it from their enemies. They feed their Queen and look after her young ones. These are the responsibilities of the worker bees. There are about thirty to forty thousand worker bees in each colony.

1. Answer the questions as directed.

1x8=8

- a) There is a _____ at the base of the large tree. (Find a word in the passage that can complete this sentence)
- b) All the bees *contribute* to the life of the colony. Rewrite the sentence replacing the word in italics.
- c) Drone bees suck up honey from the blossoms of trees. (Is this statement true/false?)
- d) Make a sentence of your own with the expression *in comparison with*.
- e) Explain the word "numerous".

- f) "The responsibility of the bees is equal in the beehive". Do you agree? Write your opinion in one sentence.
- g) "They feed their Queen and look after her young ones". Here *they* refers to _____.
- h) What is the function of pollen?

Read the following passage carefully and answer the questions.

Dengue fever and other severe dengue symptoms are the result of a viral illness spread by mosquito bites. Those infected with dengue often have a high temperature, headache, bodily pains, nausea, and rash. As Aedes mosquitoes, which transmit the dengue virus, have surged in the early days of summer, doctors have warned that Bangladesh may have an even more severe outbreak of the disease in 2023 than in the previous years. Here are 5 tips to aid you in combating this virus.

Aedes mosquitoes generally become active two hours after dawn and stay active until two hours before nightfall. Since they cannot differentiate between natural and artificial light, these mosquitoes have been reported to attack in regions that are brilliantly illuminated. Cover all windows with fine net screens if possible.

Dengue mosquitoes usually hide behind curtains, beds, sinks, wardrobes, etc. If you neglect to close the windows, you will not be able to avoid mosquitoes. As a result, you may install an ultraviolet light either directly above or close to the entranceway.

Dengue-carrying mosquitoes flourish in containers of stagnant water such as tires, rubber covers, plant pots, pet water bowls, sinks, etc. So, remove any unnecessary water from your home by draining flower pots, changing out water-filled bowls, removing any water plants, making sure your septic tank and plumbing are in good working condition, and covering any containers you use to store water. Eliminating mosquito breeding grounds helps reduce the spread of dengue fever significantly as mosquito multiplying gets disrupted.)

Mosquito repellents come in many varieties such as oils, lotions, sprays, patches, wipes, and coils. You must keep mosquitoes away from home by spraying the room, lighting a coil, or installing a liquidator. When working on a laptop, studying, doing housekeeping, or cooking, it is not always practical to sit behind a mosquito net. Therefore, apply mosquito repellent lotion to the exposed skin before starting your activity. Some repellent lotions include Vitamin E for skin protection, so choose accordingly whichever is suitable for your skin.

We have learned the value of good immunity from diseases such as dengue and corona virus in the past years. If you have a strong immune system, strong bugs do not make you sick enough to go to the hospital. So, the best way to avoid getting dengue fever would be to boost your immune system by eating a healthy diet, working out every day, and making other positive changes to your life. In fact, sleep under a mosquito net to get a good night's sleep and protect yourself from dengue fever with robust immunity.

2. Decide whether the statements are right or wrong.

$$0.5 \times 3 = 1.5$$

- a) Now dengue fever is not as formidable as coronavirus.
- b) Mosquito repellent may help you fight Aedes mosquito.
- c) Stagnant water in tires, tubes, containers is the best spots to breed aedes mosquitoes.

3. Answer the question as directed. $0.5 \times 4 = 2$

- a) The passage deals with (the origin of aedes mosquitos/severity of aedes mosquitoes/the ways to fight against aedes mosquitoes) [Choose the best answer from the alternatives]
- b) Exclusion from consideration. (Choose a word from the passage for this expression)
- c) "Changing out water-filled bowls" (Explain the expression). *Imperative*.
- d) Make a sentence with "get disrupted".

4. Complete the sentences with suitable words from the passage. $0.5 \times 3 = 1.5$

- a) Aedes mosquitoes spread dengue virus to human beings.
- b) Mosquitoes _____ helps to reduce the dengue virus infection.
- c) Nothing but a mosquito net can ensure good sleep at night and protect from dengue fever.

5. Answer the questions as per directions. $1 \times 2 = 2$

- a) What is the apparent symptom of dengue fever?
- b) Mention a hidden truth about Aedes mosquito.

Section B: Grammar Part

6. Answer the questions according to the directions. $1 \times 5 = 5$

- a. Hardest hit by the high temperature and the drought was/ were the cause of farmers' agony. (show the correct subject -verb agreement)
- b. If someone had not mentioned her name, I hardly think I (recognize) her. (Apply right form of verb)
- c. Her face along with her eyes were less radiant than the full moon. (Correct the sentence if it is incorrect)

- d. When it was daylight, I (awaken) by the sound of chopping. (Use right form of verb).
- e. The orphan boy is going to be take care of. (Is the sentence correct? If not, correct the sentence)

Section-C: Writing part

7. Answer any one of the following 05

Write a paragraph on the topic sentence given below:

Incessant rainfall in Chattogram has paralyzed the city life for days.

Or

Recently SSC results have been published. Rafi has got A+ from a famous school in the city this year. Not only he but also his parents are very glad. His relatives and neighbors are celebrating his brilliant result. Yet his father and mother are worried(Expand these sentences into a complete story)

8. Speaking test. (To be taken by the concerned teacher in a convenient time.) 05

International Islamic University Chittagong
Centre for General Education
Midterm- Examination, Autumn -2023
Course Code: UREM-1101
Course Title: Text of Ethics and Morality

Marks: 30

Duration: 1.50 hours, 30

Answer the following questions

SL	Questions	Marks	CLOs	Blooms taxonomy domain
01	<p>a. Write the meaning of Suratul Fatiyah.</p> <p>b. Explain the necessity of ethics and morality in human life.</p>	4 6	CLO-1	Remember & Creative
	<p><i>or</i></p> <p>Give a detailed introduction to Arabic language including its Moon letter and Sun letter with visible elements of pronunciation.</p>	10	CLO-1	Remember
02	Who is Muttaqi? Who were benefited from the holy Quran? Explain the conditions.	10	CLO-1	Creative
03	<p>a. How many surahs are there in the Holy Quran?</p> <p>b. How many benefits are there if you start your work with Bismillah?</p> <p>c. What are Is-tiadha and Basmalah?</p> <p>d. Write in detail about the procreation of creation of humankind.</p> <p>e. How many Makki and Madani surahs are there?</p> <p>f. Write the bad behaviors which are mentioned in Surahtul Hujarah.</p>	1 2 2 1 2	CLO-1 CLO-2	Remember & Understand