A NAAC Accredited Institution
KINGS
COLLEGE OF ENGINEERING
Recognized under 2(f) & 12(B) of UGC
Approved by AICTE, New Delhi
Affiliated to Anna University, Chennai
TÜVRheinland CERT ISO 9001

DEPARTMENT OF CIVIL ENGINEERING

REFRESHER COURSE

UNITS AND MEASUREMENTS

YEAR/SEMESTER: III/05

ACADEMIC YEAR: 2022-2023(ODD SEM)

PREPARED BY

Mr.R.RAMCHANDAR/ AP /CIVIL

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23 (ODD)

Date: 20.07.2022

CIRCULAR

This is to inform, that our department is going to conduct a **Refresher Course on UNITS AND MEASUREMENTS** on this academic year 2022-2023, interested students are requested to enroll their name to Mr.R.Ramchandar AP/CIVIL on or before **30.07.2022**.

R. Ramchandar 20/7/22

Coordinator
(Mr.R.Ramchandar AP/CIVIL)

R. Saravanan 20/07/2022

HOD/CIVIL
(DR.R.SARAVANAN)

SYLLABUS

OBJECTIVES :

- To introduce the fundamentals of units
- To know about the basic measurements
- To know about the imperial units

UNIT I - FUNDAMENTALS OF UNITS 6

Introduction - Systems of units - Traditional systems - Metric systems - Natural systems

UNIT II - TYPES OF UNITS 6

Metric System of units - The imperial system of units - US customary units - Basic standard quantity.

UNIT III - UNIT OF MEASUREMENT LIST 6

Length - Mass – capacity- Time - Temperature - Conversion of the units of measurement

UNIT IV - LENGTH, MASS & VOLUME 6

Imperial Units of Measurement - Units of Measurement for Length - Units of Measurement for Mass - Units of Measurement for Volume

UNIT V - TEMPERATURE, TIME & CHART 6

Units of Measurement for Temperature - Units of Measurement of Time - Units of Measurement Chart - Comparison of metric and imperial

TOTAL: 30 PERIODS

OUTCOMES:

At the end of the course the student will be able to understand

- Understand types of units and fundamentals.
- Gain knowledge on system of units
- Measuring using different system of units.
- Gain knowledge on units and measurements
- The use of various units.

R. Ramchandar 22/7/22

STAFF INCHARGE
(Mr.R.RAMCHANDAR)

R. Saravanan 22/07/2022

HOD/CIVIL
(Dr.R.SARAVANAN)

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DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

Sub Name	: UNITS AND MEASUREMENTS	**Branch / Year / Sem**	: B.E Civil /III/05
Staff Name	: Mr.R.Ramchandar	**Batch**	: 2019-2023
		Academic Year	: 2022-23(ODD)

Topic No	Topic	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT I	**FUNDAMENTALS OF UNITS**			**(6)**
1	Introduction - Systems of units	BB	2	2
2	Traditional systems	PPT	2	4
3	Metric systems - Natural systems	BB	2	6
UNIT II	**TYPES OF UNITS**			**(6)**
4	Metric System of units	BB	1	7
5	The imperial system of units	BB	2	9
6	US customary units	BB/PPT	2	11
7	Basic standard quantity.	BB	1	12
UNIT III	**UNIT OF MEASUREMENT LIST**			**(6)**
8	Length	BB	1	13
9	Mass - capacity	BB	2	15
10	Time	BB/PPT	1	16
11	Temperature	BB	1	17
12	Conversion of the units of measurement	BB	1	18
UNIT IV	**LENGTH, MASS & VOLUME**			**(6)**
13	Imperial Units of Measurement	BB/PPT	2	19
14	Units of Measurement for Length	BB	2	21
15	Units of Measurement for Mass	BB/PPT	1	22
16	Units of Measurement for Volume	BB	1	23
UNIT V	**TEMPERATURE, TIME & CHART**			**(6)**
17	Units of Measurement for Temperature	BB/PPT	1	24
18	Units of Measurement of Time	BB	2	26

19	Units of Measurement Chart	BB/PPT	2	28
20	Comparison of metric and imperial	BB	2	30

COURSE OUTCOME

At the end of the course the student will be able to understand

- Understand types of units and fundamentals.
- Gain knowledge on system of units
- Measuring using different system of units.
- Gain knowledge on units and measurements
- The use of various units.

R. Ramchandar 22/7/22

Prepared by

(Mr.R.RAMCHANDAR)

R. Dhanam 22/07/2022

Verified By

HOD/CIVIL

Format-QP06

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DEPARTMENT OF CIVIL ENGINEERING

SPECIAL TIME TABLE (1.8.2022 - 6.8.2022,ODD SEM)

B.E – CIVIL (Regulation 2017) - With Effect from 1.8.2022

Batch:2020 - 2024 **Strength:20**

Year: III **Semester: V** **Class Room : 235** **Block: II**

Session	1	2	10.45 am - 11.00 am	3	4	12.30 pm - 01.10 pm	5	6	02.40 pm - 02.50 pm	7	8
Day	09.15am - 10.00am	10.00am - 10.45am		11.00am - 11.45am	11.45am - 12.30pm		01.10pm - 01.55pm	01.55pm - 02.40pm		02.50pm - 03.35pm	03.35pm - 04.20pm
MON	ORIENTATION		BREAK	COMM.SKILL		LUNCH BREAK	BC		BREAK	CC	
TUE	RFC			COMM.SKILL			BC			CC	
WED	RFC			T&P(A)	T&P(SS)		BC			CC	
THU	RFC			COMM.SKILL			BC			CC	
FRI	RFC			COMM.SKILL			BC			CC	
SAT	RFC			COMM.SKILL			BC			CC	

SUB CODE	NAME OF THE SUBJECT	CREDITS	NAME OF THE STAFF	DEPT	PERIODS/WEEK
VALUE ADDITION INTIATIVES (VAI)					
Orientation	Orientation Program	-	Mr.R.Sundharam	CIVIL	2
BC	Bridge Course	-	Ms.K.Elakkiya	CIVIL	12
COMM.SKILL	Communication Skill	-	Mr.J.Radhakrishnan	ENGLISH	10
RFC	Refresher Course	-	Mr.R.Ramchandar	CIVIL	10
T&P (A)	Training & Placement - Aptitude		Dr.K.Sudhakar	T&P	1
T&P(SS)	Training & Placement - Softskill		Mr.B.Suresh Babu	T&P	1
CC	Certification Course - AutoCADD	-	Mr.R.Chandrasekar	CIVIL	12

CLASS CO-ORDINATOR	NAME OF THE REPRESENTATIVES	ROLL NO
Mr.R.Sundharam	G.Bharath S.Sneha	01 13

VALUE ADDITION INTIATIVES (VAI) - REGULAR HOURS					
CC	Certification Course - AutoCADD	VAI	Mr.R.Chandrasekar	CIVIL	2
GATE / CE	GATE / Competitive Exam	VAI	Ms.D.Shrividhya	CIVIL	2
LIB/NET	Library / Internet	VAI	Mr.R.Sundharam	CIVIL	1
NPTEL	NPTEL Swayam Courses	VAI	Mr.K.Arun	CIVIL	1
T&P (A)	Training & Placement - Aptitude	VAI	Dr.K.Sudhakar	T&P	1
T&P(SS)	Training & Placement - Softskill	VAI	Mr.B.Suresh Babu	T&P	1
VAC	Value Added Course on Urban Planning	VAI	Mr.R.Chandrasekar	CIVIL	3

30/7/22
DEPT. TTC

30/07/2022
HOD

30/7/2022
PRINCIPAL

UNITS AND MEASUREMENT

INTRODUCTION

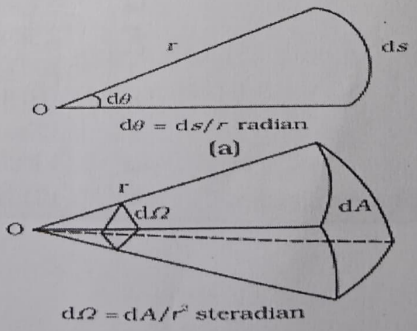
Measurement of any physical quantity involves comparison with a certain basic, arbitrarily chosen, internationally accepted reference standard called **unit**. The result of a measurement of a physical quantity is expressed by a number (or numerical measure) accompanied by a unit. Although the number of physical quantities appears to be very large, we need only a limited number of units for expressing all the physical quantities, since they are interrelated with one another. The units for the fundamental or base quantities are called **fundamental or base units**. The units of all other physical quantities can be expressed as combinations of the base units. Such units obtained for the derived quantities are called **derived units**. A complete set of these units, both the base units and derived units, is known as the **system of units.**

THE INTERNATIONAL SYSTEM OF UNITS

In earlier time scientists of different countries were using different systems of units for measurement. Three such systems, the CGS, the FPS (or British) system and the MKS system were in use extensively till recently. The base units for length, mass and time in these systems were as follows :

- In CGS system they were centimetre, gram and second respectively.
- In FPS system they were foot, pound and second respectively.
- In MKS system they were metre, kilogram and second respectively.

The system of units which is at present internationally accepted for measurement is the Système Internationale d' Unites (French for International System of Units), abbreviated as SI. The SI, with standard scheme of symbols, units and abbreviations, was developed and recommended by General Conference on Weights and Measures in 1971 for international usage in scientific, technical, industrial and commercial work. Because SI units used decimal system, conversions within the system are quite simple and convenient. We shall follow the SI units in this book. In SI, there are seven base units as given. Besides the seven base units, there are two more units that are defined for (a) plane angle dθ as the ratio of length of arc ds to the radius r and (b) solid angle dΩ as the ratio of the intercepted area dA of the spherical surface, described about the apex O as the centre, to the square of its radius r, as shown in Fig. (a) and (b) respectively. The unit for plane angle is radian with the symbol rad and the unit for the solid angle is steradian with the symbol sr. Both these are dimensionless quantities.



SI Base Quantities and Units

Base quantity	SI Units		
	Name	Symbol	Definition
Length	metre	m	The metre is the length of the path travelled by light in vacuum during a time interval of 1/299,792,458 of a second. (1983)
Mass	kilogram	kg	The kilogram is equal to the mass of the international prototype of the kilogram (a platinum-iridium alloy cylinder) kept at international Bureau of Weights and Measures, at Sevres, near Paris, France. (1889)
Time	second	s	The second is the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium-133 atom. (1967)
Electric current	ampere	A	The ampere is that constant current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross-section, and placed 1 metre apart in vacuum, would produce between these conductors a force equal to 2×10^{-7} newton per metre of length. (1948)
Thermo dynamic Temperature	kelvin	K	The kelvin, is the fraction 1/273.16 of the thermodynamic temperature of the triple point of water. (1967)
Amount of substance	mole	mol	The mole is the amount of substance of a system, which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon - 12. (1971)
Luminous intensity	candela	cd	The candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12} hertz and that has a radiant intensity in that direction of 1/683 watt per steradian. (1979)

Some units retained for general use (Though outside SI)

Name	Symbol	Value in SI Unit
minute	min	60 s
hour	h	60 min = 3600 s
day	d	24 h = 86400 s
year	y	365.25 d = 3.156×10^7 s
degree	°	$1^\circ = (\pi/180)$ rad
litre	L	1 $dm^3 = 10^{-3}$ m^3
tonne	t	10^3 kg
carat	c	200 mg
bar	bar	0.1 MPa = 10^5 Pa
curie	Ci	3.7×10^{10} s^{-1}
roentgen	R	2.58×10^{-4} C/kg
quintal	q	100 kg
barn	b	100 $fm^2 = 10^{-28}$ m^2
are	a	1 $dam^2 = 10^2$ m^2
hectare	ha	1 $hm^2 = 10^4$ m^2
standard atmospheric pressure	atm	101325 Pa = 1.013×10^5 Pa

Physical Quantity	SI Unit of Measurement	Symbol
Length	Meter	m
Mass	Kilogram	kg
Temperature	Kelvin	K
Time	Second	s
Capacity/Volume	Litre	L
Current	Ampere	A
Amount of Substance	Mole	mol

Unit of Measurement List

The table above shows the SI units but we use other units as well to measure the given physical quantities. Let us list some of the commonly used to units of measurement below:

- Length - kilometer, meter, centimeter, millimeter
- Mass - kilogram, gram, milligram
- Capacity - kilolitre, litre, milliliter, centilitre
- Time - Minute, Hour, Second, Days, Week, Month, Year
- Temperature - Kelvin, Celsius, Fahrenheit

All the above units for a specific physical quantity can be expressed in terms of each other using the conversion of the units of measurement.

Imperial Units of Measurement

Imperial units of measurement are the units from the British Imperial System (System of Weights and Measures used in Great Britain). As we discussed the metric units, the imperial system uses different units to measure the physical quantities like length, mass, volume, and area. Let us go through imperial units of measurement in the table below:

Traditional systems

Historically many of the systems of measurement which had been in use were to some extent based on the dimensions of the human body. As a result, units of measure could vary not only from location to location but from person to person.

Metric systems

Metric systems of units have evolved since the adoption of the original metric system in France in 1791. The current international standard metric system is the International System of Units (abbreviated to SI). An important feature of modern systems is standardization. Each unit has a universally recognized size.

Both the imperial units and US customary units derive from earlier English units. Imperial units were mostly used in the British Commonwealth and the former British Empire. US customary units are still the main system of measurement used in the United States outside of science, medicine, many sectors of industry, and some of government and military, and despite Congress having legally authorised metric measure on 28 July 1866.[7] Some steps towards US metrication have been made, particularly the redefinition of basic US and imperial units to derive exactly from SI units. Since the international yard and pound agreement of 1959 the US and imperial inch is now defined as exactly 0.0254 m, and the US and imperial avoirdupois pound is now defined as exactly 0.45359237 kg.

Natural systems

While the above systems of units are based on arbitrary unit values, formalised as standards, some unit values occur naturally in science. Systems of units based on these are called natural units. Similar to natural units, atomic units (au) are a convenient system of units of measurement used in atomic physics.

Also a great number of unusual and non-standard units may be encountered. These may include the solar mass (2×10^{30} kg), the megaton (the energy released by detonating one million tons of trinitrotoluene, TNT) and the electronvolt.

Metric Units of Measurement

The metric units of measurement in mathematics are standard units defined to measure length, height, weight, area, and capacity (volume). It is based on the decimal system as it includes numbers in powers of 10. The modern form of the metric units are called the SI units and are accepted worldwide. Each unit has a universally recognized size. Let us see some of the commonly used SI units in the table below.

SI Units of Measurement

SI units of measurement are units of the international system of units, also known as the metric system which is used across the world and each unit has a standard measure.

Physical Quantity	Imperial Units
Length	foot, inch, yard, mile
Mass	ounce, pound, stone, ton
Capacity	gallon, pint, quart, fluid ounce

Note: The imperial units of measurement can be expressed in terms of the metric units and vice-versa as they are standard units.

Units of Measurement for Length

Length is a physical quantity that gives the measure of how long an object is. There are different aspects of measuring length such as distance covered, height, etc. Units of measurement for all the physical quantities belong to the same category. Each unit of measuring length can be expressed in terms of each other using the conversion method as these units have a standard value. Let us see the commonly used metric and imperial units of measurement of length below along with their relations with one another.

System	Units of Measurement	Conversion
Metric Units	Centimeter (cm)	1 cm = 10 mm
	Meter (m)	1 m = 100 cm
	Kilometer (km)	1 km = 1000 m
	Millimeter (mm)	1 mm = 0.001 m
Imperial Units	Foot (feet)	1 foot = 12 inch
	Inches (inch)	1 inch = 0.83333 feet
	Mile	1 mile = 5280 feet
	Yard	1 yard = 3 feet = 36 inch

Units of Measurement for Mass

Mass is a physical quantity that tells how heavy or light an object is. It is also commonly called the weight of the object. The SI unit of mass is the kilogram (kg). The table below shows the different and commonly used units of measuring mass in the metric and imperial systems along with their conversions:

System	Units of Measurement	Conversion
Metric Units	Milligram (mg)	1 mg = 0.001 g
	Gram (g)	1 g = 1000 mg
	Kilogram (kg)	1 kg = 1000 g
Imperial Units	Ounce (oz)	1 oz = 0.0625 lb
	Pound (lb)	1lb = 16 oz
	Ton	1 ton = 2000 lbs

Please note that there are other units of measurement of mass that are used such as tonnes, stone, microgram imperial ton, etc. The above table shows the commonly used units only.

Units of Measurement for Volume

Volume, also known as the capacity, gives the amount of space that an object occupies or the maximum space the object has. The SI unit of volume is litre (L). We can also express the units of measuring volume in terms of cubic length units such as centimeter cube (cm^3), meter cube (m^3), etc. Let us go through some of the commonly used units of measurement of volume in the table below:

System	Units of Measurement	Conversion
Metric Units	Millilitre (ml)	1 m = 0.001 l
	Litre (l)	1 l = 1000 ml
	Kilolitre (kl)	1 kl = 1000 l
	Cubic Centimeter (cm^3)	1 l = 1000 cm^3
Imperial Units	Fluid ounce (fl. oz.)	1 fl. oz. = 1/20 pt
	Gallon (gal)	1gal = 128 fl. oz.
	Pint (pt)	1 pt = 16 fl. oz.

Units of Measurement for Temperature

Temperature is a physical quantity that describes how hot or cold an object or the weather is. We have mainly three units of measurement of temperature, Celsius, Kelvin, and Fahrenheit. Kelvin is the SI unit of measuring temperature. The table given below shows the different units of measuring temperature and their conversion.

Units of Measurement of Time

Time is a measure that tells about the time taken to complete a process, travel from one point to another. It is an ongoing process of continuous events. We measure time in three units, seconds, minutes, hours, days, weeks, months, and years. The table given below describes these units and their relation with each other.

Units of Measurement Chart

Now that we have discussed the different units of measurement used across different systems of measurement, let us summarize the units in a chart below for a quick review:

Quantity	Units of Measurement
Length	Meter, Kilometer, Centimeter, Millimeter, Feet, Yard, Inch, Mile
Mass	Gram, Milligram, Kilogram, Ounce, Pound, Ton
Volume	Litre, Millilitre, Kilolitre, Gallon, Pint, Fluid Ounce
Time	Second, Minute, Hour, Day, Month, Week, Year
Temperature	Kelvin, Celsius, Fahrenheit,

Important Notes on Units of Measurement

- The **units of measurement** are the units that are used to represent physical quantities like length, mass, temperature, current, area, volume, intensity, etc.
- We use two systems of units of measurement - metric and imperial.
- In the early days, hand span, arm span, and foot span were used as units of measurement.

Example 1: What is the unit 'acre' used for? Express one acre in terms of sq. yards and sq. feet.

Solution: An acre is a unit of measurement of area. Earlier, it was used to measure the size of the field. One acre is equal to 43,560 square feet. We can also express acre in terms of square yards.

1 acre = 43,560 square feet = 4840 square yards.

Answer: 1 acre = 43,560 square feet = 4840 square yards.

Example 2: Convert 5 kilograms in an imperial unit of measurement pound.

Solution: We know that 1 kilogram is approximately equal to 2.2 pounds. So, 5 kg in pounds is given by,

5 kg = 5 × 2.2 pounds

= 11 pounds

Answer:5kg is equal to 11 pounds.

Example 3: How many feet are there in 3 miles?

Solution: We know that 1 mile is equal to 5280 feet. So, 3 miles in feet are given by,

3 miles = 3 × 5280 feet

= 15,840 feet

Answer: 3 miles is equal to 15, 840 feet.

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DEPARTMENT OF CIVIL ENGINEERING

STUDENTS ENROLMENT

The following students were interested in enrolling their name in Refresher Course – **UNITS AND MEASUREMENTS** for the academic year 2022-2023.

S. No	Reg. No	Name of the Student	Signature of the Student
1	821120103001	BHARATH G	
2	821120103002	DHARUN KUMAR K	
3	821120103003	HARIHARAN B	
4	821120103004	JAILAKSHMAN S	
5	821120103005	JENOVA JASMINE N	
6	821120103006	KATHIRESWARI P	
7	821120103007	KIRUTHIKASRI J	
8	821120103008	MAHARISH H	
9	821120103009	MOHAMED FAISAL B	
10	821120103010	NIKESHA J	
11	821120103013	SNEHA S	
12	821120103014	SRIRAM M C	
13	821120103015	VISHNU R	
14	821120103301	AKARAMUTHALVAN D	
15	821120103302	ATHITHIYAN E	
16	821120103303	DULASIRAM S	
17	821120103305	HARI HARAN U	
18	821120103306	JOSHUVA M	
19	821120103307	KRISHNA KANTH N	
20	821120103308	MADHAVAN S	

Total Number of students enrolled: 20

1/8/22

Signature of Course Incharge

01/08/2022

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23 (ODD SEM)

III YEAR CIVIL / V SEM

REFRESHER COURSE ON "UNITS AND MEASUREMENTS" - ATTENDANCE REPORT

S.No.	Reg. Number	Student Name	2/3/22	3/3/22	4/3/22	5/3/22	6/3/22	8/3/22	8/3/22	9/3/22	9/3/22	13/3/22	14/3/22	21/3/22	27/3/22	28/3/22	28/3/22
			1,2	1,2	1,2	1,2	1,2	4,5	6	4,5	6	6,7	4,5,6	5,6	6,7,8	5,6	7,8
1	821120103001	BHARATH G	/	/	/	/	/	A	/	/	/	/	/	/	/	/	/
2	821120103002	DHARUN KUMAR K	A	/	/	/	/	/	/	/	/	/	A	/	/	/	/
3	821120103003	HARIHARAN B	/	/	/	/	A	/	/	/	/	/	/	/	/	/	/
4	821120103004	JAILAKSHMAN S	/	/	/	/	/	/	/	/	/	/	A	/	/	/	/
5	821120103005	JENOVA JASMINE N	A	/	/	/	/	/	/	/	/	/	/	/	/	/	/
6	821120103006	KATHIRESWARI P	A	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7	821120103007	KIRUTHIKASRI J	/	/	/	/	/	/	A	/	/	/	/	/	/	/	/
8	821120103008	MAHARISH H	/	/	/	/	A	/	/	/	/	/	/	/	A	/	/
9	821120103009	MOHAMED FAISAL B	/	A	/	/	/	/	/	A	A	/	/	/	/	/	/
10	821120103010	NIKESHA J	/	/	/	A	/	/	/	/	/	/	/	/	/	/	/
11	821120103013	SNEHA S	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
12	821120103014	SRIRAM M C	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
13	821120103015	VISHNU R	A	/	/	/	/	/	/	A	A	/	/	/	/	/	A
14	821120103301	AKARAMUTHALVAN	/	/	/	/	/	/	/	/	/	/	A	A	/	/	/
15	821120103302	ATHITHIYAN E	/	/	/	A	/	/	/	A	/	/	/	/	/	/	/
16	821120103303	DULASIRAM S	/	/	/	/	A	/	/	/	/	/	A	/	/	/	/
17	821120103305	HARI HARAN U	/	/	/	/	/	/	/	/	/	/	/	/	A	/	A
18	821120103306	JOSHUVA M	/	/	/	/	/	/	A	/	/	/	/	/	A	/	/
19	821120103307	KRISHNA KANTH N	/	/	/	/	/	A	A	/	/	/	/	/	A	/	/
20	821120103308	MADHAVAN S	/	/	/	A	/	/	/	/	/	A	/	/	/	/	/
TOTAL STUDENTS			20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
PRESENT			16	19	20	17	17	18	17	17	18	19	16	19	16	20	18
ABSENT			04	01	-	03	03	02	03	03	02	01	04	01	04	-	02
COURSE INCHARGE SIGN																	

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ACADEMIC YEAR 2022-23 (ODD SEM)

RFC-UNITS AND MEASUREMENTS

Assessment Marks

III YEAR CIVIL / 05 SEM

S.No.	Reg. Number	Student Name	Total Marks (50)
1	821120103001	BHARATH G	45
2	821120103002	DHARUN KUMAR K	38
3	821120103003	HARIHARAN B	40
4	821120103004	JAILAKSHMAN S	42
5	821120103005	JENOVA JASMINE N	45
6	821120103006	KATHIRESWARI P	46
7	821120103007	KIRUTHIKASRI J	42
8	821120103008	MAHARISH H	45
9	821120103009	MOHAMED FAISAL B	40
10	821120103010	NIKESHA J	42
11	821120103013	SNEHA S	48
12	821120103014	SRIRAM M C	42
13	821120103015	VISHNU R	40
14	821120103301	AKARAMUTHALVAN D	38
15	821120103302	ATHITHIYAN E	36
16	821120103303	DULASIRAM S	40
17	821120103305	HARI HARAN U	40
18	821120103306	JOSHUVA M	44
19	821120103307	KRISHNA KANTH N	38
20	821120103308	MADHAVAN S	40

R. Ramchandar 30/8/22

SUBJECT INCHARGE

(Mr.R.RAMCHANDAR)

R. Saravanan 30/08/2022

HOD/CIVIL

(DR.R.SARAVANAN)

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CERTIFICATE OF PARTICIPATION

This is to certify that Mr./Ms. **G.BHARATH** of **III YR** Civil Engineering has completed **REFRESHER COURSE** in the topic **UNITS AND MEASUREMENTS** organized by the Department of Civil Engineering, Kings College of Engineering, Thanjavur, during **AUGUST 2022**.

R. Ramchandar		J. Arputha
Mr.R.RAMCHANDAR	**Dr.R.SARAVANAN**	**Dr.J.ARPUTHA VIJAYA SELVI**
COURSE INCHARGE	**HOD/CIVIL**	**PRINCIPAL**

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COURSE INCHARGE	HOD/CIVIL	PRINCIPAL