STUDENTS ASSIGNMENTS Departments of Science & Commerce 2021-22

GOVT. DEGREE COLLEGE: RAYACHOTY
DEPARTMENT OF ZOOLOGY

ASSIGNMENTS - ACADEMIC YEAR: 2021 –2022

Name of the Lecturer: Dr.M.Muniya Naik

S.No.	Date	Class	Topic
1	08-4-22	III BZC	Golgi Complex.
2	17-2-22	III BZC	Nucleus.
3	08-4-22	III BZC	Ultra structure of Animal cell.
4	19-2-22	III BZC	Endoplasmic reticulum.
5	08-4-22	III BZC	Gene interaction
6	20-3-22	III BZC	Polygenes
7	12-04-22	III BZC	Chromosomes.
8	17-3-22	III BZC	Multiple alleles.
9	8-4-22	III BZC	Mutation theory.
10	8-4-22	III BZC	Replication of Bacteriophage
11	2-2-22	III BZC	Sex determination.
12	8-4-22	III BZC	Lethal gene.
13	5-3-22	III BZC	Ribosomes.
14	8-4-22	III BZC	co-dominance - incomplete dominance.
15	3-3-22	III BZC	Mycoplasma.
16	3-2-22	III BZC	prokaryotic and Eukaryotic cell.
17	8-4-22	III BZC	Viruses.
18	8-4-22	III BZC	Viroid.
19	20-3-22	III BZC	Lysosomes.
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COMMISSIONERATE OF COLLEGIATE EDUCATION

GOVERNMENT OF ANDHRA PRADESH

ZOOLOGY

(UG courses)

GOVERNMENT DEGREE COLLEGE

RAYACHOTY, ANNAMAYYA (Dist.)

DEPARTMENT OF ZOOLOGY

Name of the Lecturer : Dr. M. MUNIYA NAIK

M.Sc. M.Phil., Ph.D., CSIR-NET.,

Name of the Department : ZOOLOGY

Academic Year : 2021-22

STUDENT ASSIGNMENTS REGISTER

intercross: AaBb × AaBb
mulattos mulattos

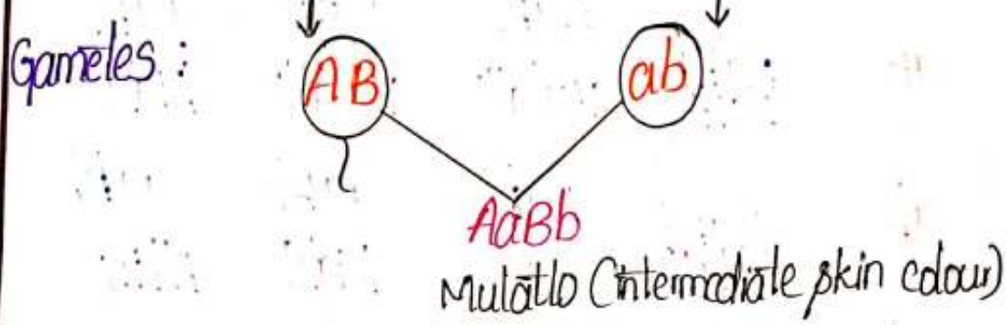
♀ \ ♂	AB	Ab	aB	ab
AB	AABB Negro	AABb Dark	AaBB Dark	AaBb Mulatto
Ab	AABb Dark	AAbb Mulatto	AaBb Mulatto	Aabb Light
aB	AaBB Dark	AaBb Mulatto	aaBB Mulatto	aaBb Light
ab	AaBb mulatto	Aabb Light	aaBb Light	aabb Albino

F2: 1/16 - 4/16 - 6/16 - 4/16 - 1/16
Negro Mulatto Negro Mulattoes Light Albino

posses the genotype AaBb. The Mulattos contain only two dominant genes and they produce only 50% pigments when compared to the negro who has 4 dominant genes. A mating of two such mutlattoes produces a wide variety of skin colour in the offspring, ranging from skins as dark as the original negro parent to as white as the the original albino parent. The result of this cross has been shown below:

parents: Negro X Albino

AA BB aa bb



Mulatto (intermediate skin colour)

Eg: Skin colour in man:

For example human skin colour varies in the population in gradation. It is called a quantitatives character. In man, skin colour is depend up on the prezence or absence of pigment melanin. Black skin is due to the prezence of melanin white skin is due to the absence of melanin.

Skin pigmentation in humans is controlled by atleast two or more inherited genes. In 1913 Development observed that black colour in Negro is controlled by the action of two types of dominant genes. They are A and the white skin is due to the prezence of recessive gene a and b. ∴ a pure negro has a genotype AABB and the pure white has aabb.

Marriage b/w black negroes & white albinos, race results in F1 offspring are intermediate b/w both parents. These are called 'mutttons'. Mulattos.

polygenes

The inheritance of two or more non-allelic gene controlling a single quantitive character in a cumulative fashion is called multiple gene inheritance. These genes are called pollygenes. The inheritance of polygene is called quantitative inheritance (or) polygenic inheritance.

Characteristic of polygene:

* polygenes for quantitative traits have following characters.
* Each contributing allele in the series of polygenes produces an equal effect.
* effect of each contributing alleles are cumulative (or) additive
* There is no epistasis among genes at different loci
* There is no linkage involved.
* Skin colour, height, weight in man and intelligence are the examples of polygenic inheritance.

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GOVERNMENT DEGREE COLLEGE

RAYACHOTY – 516269, KADAPA DISTRICT. (A.P.)

DEPARTMENT OF ZOOLOGY

(UG courses)

Assignment on

polygenes

Topic Submitted
BY

Name of the Student : P. VaNItha

Class : Degree 2nd yr

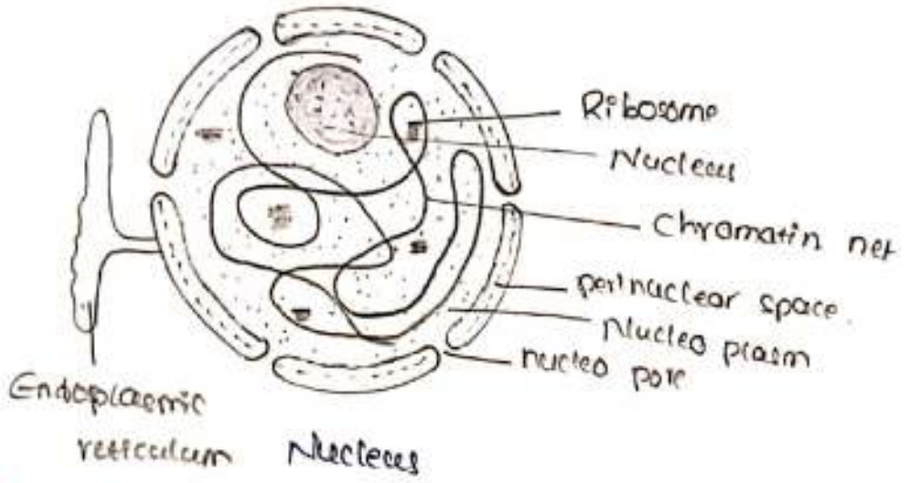
Date : 20-3-22

Academic Year: 2021- 2022

and inner layer.

2. Nuclear sap | Nucleoplasm :- The nucleus is filled with transport, semi-solid, acidophilic substance known as the nuclear sap or nucleoplasm or karyolymph.

3. Chromatin Reticulum :- The nucleoplasm contains many treated like structures called chromosomes, which form a network called the chromatin reticulum.



Function of Nucleus :-

* Nucleus contain the master plan for protein synthesis.
* Nucleous contains & associated with the formation of ribosomes.
* The synthesis of ribosomal RNA takes place in the nucleus.
* The nucleus regulates the cell cycle.

nuclei are known as polynuclear cells.

Eg:- Opalina.

The shape of the nucleus is related with the shape of the cell. Generally the nucleus is spherical.

The size of the nucleus is not constant. Generally nucleus occupies about 10 percent of the total cell volume. Nuclei vary in size from about 3 μm to 25 μm in diameter depending on cell type.

$$\text{Nucleocytoplasmic index} = \frac{\text{volume of the nucleus}}{\text{volume of the cytoplasm - volume of nucleus}}$$

$$NP = \frac{Vn}{Vc - Vn}$$

$\therefore Vn$ = Volume of the nucleus

Vc = volume of the cytoplasm.

Structure :- The nucleus is composed of following four parts. They are :

(1) Nuclear membrane

(2) Nuclear cap / Nucleoplasm

(3) Chromation reticulum

(4) Nucleolus.

Nuclear envelop :- The nucleus is separated from the cytoplasm by a semipermeable membrane called nuclear membrane. Nuclear membrane is double layered namely outer layer

NUCLEUS

Nucleus is the most important part of the cell. It controls all the cellular activities. So it is refferred to as the controlling centre of the cell. Nucleus was first discovered by Robert Brown. The study of nucleus of nucleus is called karyology. The nucleus is present in all eukaryotic cells. However it is absent from RBC of man and some lens cells of eye.

Generally, a cell contains only one nucleus. But some times two or more nuclei are present. Based on the the number of nucleus, the cells are classified onto the following types.

1. Mononucleate Cells :-

The cells which contain single nucleus. Such cells are called mononucleate cells. Eg :- Amoeba, a typical cell.

2. Binucleate cells :- The cells which contain two nuclei are known as binucleate cells.

Eg : paramecium and cells of cartilage and liver.

3. polynucleate cells :- The cells which contain many

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RAYACHOTY – 516269, KADAPA DISTRICT. (A.P.)

DEPARTMENT OF ZOOLOGY

(UG courses)

Assignment on

NUCLEUS

Topic Submitted
BY

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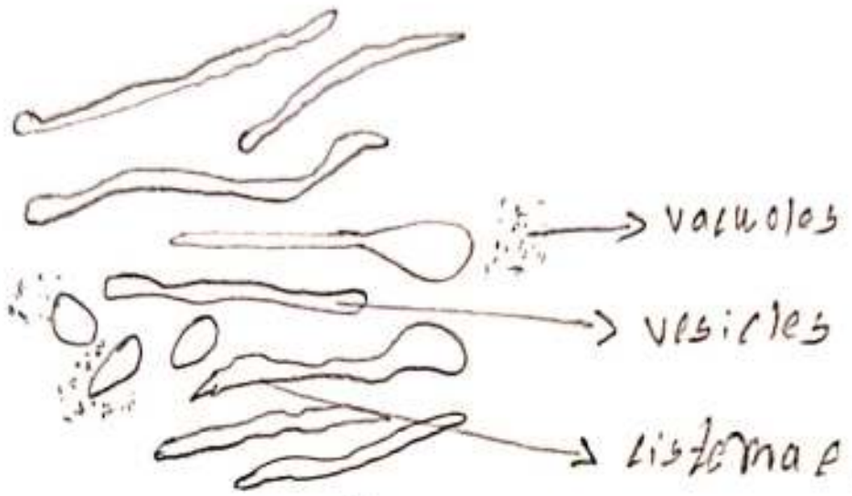
Class : 2nd year (BZC)

Date : _____

Academic Year: 2021- 2022

of the cisternae They develop either by budding or by constriction of the ends of the cisternae

The membrane of the golgi body is an used membrane and innilipid layer and two outer protein layers.



Golgi complex

functions of Golgi complex :-

1. The across soma of sperm is developed from golgi complex spermatogenesis.
2. golgi complex is involved in cell wall formation in plant cells.
3. Golgi complex involves in the formation of plasma membrane in animal cell.

of about 20-30nm. They are arranged in parallel bundles one above the other. In a Golgi complex the number of cisternae various from 3-7 in a animal cells and 10-20 in plant cells. the cisternae are slightly curved.

Hence the cisternae have convex and concave surface. cisternae has two sides namely forming face and maturing face.

the convex surface is the forming face Here new cisternae are added from endoplasmic reticulum.

② vacuoles :-

These are large spherical round sacs found at edges of cisternae these are formed by the expansion of the cisternae in which the two membranes are widely separated the cavity is about 60-200 nm.

③ vesicles :-

These are small drop like structure of about 40A in diameter. These are closely associated with the periphery

GOLGI COMPLEX

Golgi complex was discovered by camillo golgi in the nerve cells of barn owl. The golgi complex has been variously named as golgi golgi apparatus lipoeudrion dicoty some by various workers. Generally the term dictyosome is used for the golgi complex of lower invertebrate and plant cells.

Golgi complex is found in our eukaryotic cells exept RBC and sperms of mammaous and absent in prokaryotic cells. The shape of the golgi complex varies from one cell to another. They may be in the from of rods, granules vesicles or network - even in the same cell. there are variations with functional stages.

structure :-

under the electron microscope, the golgi apparatus cheppers to consist of three components they are : 1 cisternae 2 -vacuoles 3. vesicles.

1. cisternae :- these are flattended fluid filled sacs separated by intercisternal space

①

GOVERNMENT DEGREE COLLEGE

RAYACHOTY – 516269, KADAPA DISTRICT. (A.P.)

DEPARTMENT OF ZOOLOGY

(UG courses)

Assignment on

GOLGI COMPLEX.

Topic Submitted BY

Name of the Student : B. obulesu

Class : BSc. BZC IInd year III SEM

Date : 08-04-2022

Academic Year: 2021- 2022

the support and development of life. In addition to nitrogen gas and oxygen also contains small quantities of argon (0.9%) and carbon dioxide [0.03%] and traces of inert gas ozone sulphurdioxide Ammonia Carbon monoxide and a varying percentage of water vapour.

4. Biosphere :- In addition to the three constituents of the environment the biosphere namely the living organisms around man play an important role in influencing him the plants play an important role in maintaining the oxygen and Carbondioxide levels of the atmosphere. In other words they exert a profound influence on life.

Biosphere also comprises of the organisms that are essential as well as harmful to humans. These organisms include plants species such as algae and fungi and bacteria viruses and microbes

1) The lithosphere :- Ay. - the name indicates the rocks that form the earth Constitute this part of environment However the top layers of the earth mainly from this part of environment o/. lithosphere these top layers consists of several metalic silicates and other minerals and humus which is the vital organic part that is formed from the decayed plants and animals

2) The hydrosphere :- The development of human civilization and the recognition of the importance of water almost began at the same time Water is as essential as food for the survival of living beings About 97% of the water available is in the form of sea only 1% of water is good for human consumption

3. The atmosphere :- The atmosphere is an important part of man's environment it Contains mostly of 2 elements Nitrogen and oxygen [78 & 21 %] respectively these two elements play a vital role for

1. What is environment ? And explain the segments of environment

Ans: The environment of man comprises of the following segments

a) Lithosphere:- This is the upper layer of the earth and the minerals and rocks that forms from this layer

b) Hydrosphere:- This is the water that is on the earth All sources of water viz the sea the rivers and ground water are parts of the segments

c) Atmosphere:- this is the air around man the gases that form part of the atmosphere and their influence on life are discussed under this heading

d) Biosphere:- The living organisms that form part of man's environment are discussed in this and their inform of man are also envisaged

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Chemistry

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	25-2-22	III - B.Sc	Environment - Segments

Sl. NO	Name of the Student	Signature of the Student
1	G. Praveen Kumar	G. Praveen kumar
2	S. Irfan Basha	S. Irfan Basha
3	S. Akbar Basha	S. Akbar Basha
4	S. Yasar	S. Yasar
5	B. Raghavudu	B. Raghavudu
6	B. Sai Kumar.	B. Sai kumar
7	M. Reddappa Reddy	M. Reddappa Reddy
8	N. Satish Kumar	N. Satish kumar
9	P. Ram Mohan	P. Ram Mohan
10	G. Hajira	G. Hajira
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Signature of the Lecturer

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GOVT.DEGREE COLLEGE
RAYACHOTY

Department of chemistry

Name of the student : G. praveen kumar

Group : III BZC

Course : BSC

Roll No : 190310633001

Title of the Assignment : Environment - Segements

prevention measures:-

(1) waste water management:-

waste water treatment consists of removing pollutants from waste water through a physical chemical or biological process.

(2) Green agriculture:-

Globally, agriculture accounts for 70% of water resources, so it is essential to have climate friendly crops, efficient irrigation that reduces the need of water. Green agriculture is also crucial to limit the chemicals that enter the water.

(3) storm water management:-

storm water management is the effort to reduce runoff of rain water or melted snow into streets, Lawns and other sites and the improvement of water quality.

(4) Air pollution prevention:-

Air pollution has a direct impact on water contamination as 25% of human induced CO_2 emissions are absorbed by oceans. this pollution causes a rapid acidification of our oceans, and threatens marine life and corals. preventing air pollution is the best way to prevent this from happening.

(4) Marine dumping:

Every day, garbage such as plastic paper, aluminum, food, glass, or rubber are deposited in to the sea. these items take weeks to hundreds of years to decompose, and thus they are a major cause of water pollution.

water pollution effects:

(1) on the environment:

Water pollution truly harms biodiversity and aquatic ecosystems. the toxic chemicals can change the colour of water and increase the amount of minerals also known as eutrophication.

(2) ON human health:

Water pollution has very negative effects on public health. A lot of diseases results from drinking or being in contact with contaminated water, such as diarrhea, cholera, typhoid, or skin infections.

sources of water pollution:-

unsurprisingly, human activity is primarily responsible for water pollution, even if natural phenomenon such as landslides and floods can also contribute to degrade the water quality.

(1) Sewage and wastewater:

Inadequate sewage collection and treatment are sources of water pollution. According to the united Nations, more than 80% of the world wide wastewater goes back in the environment without being treated or reused.

(2) Agriculture:

Agriculture has an impact on water pollution due to the use of chemicals such as fertilizers, pesticides, Fungicides, herbicides or insecticides running off in the water, as well as livestock excrement, manure, and methane (green house effect).

(3) Industries:-

Industries produce a lot of waste containing toxic chemicals and pollutants. A huge amount of the industrial waste is drained in the fresh water which then flows in to canals, rivers and eventually in the sea.

(5) what is water pollution? Explain it's sources, effects and controls?

(A) water pollution can be defined as the contamination of a stream, river, lake, ocean or any other stretch of water, depleting water quality and making it toxic for the environment and humans.

There are two types of water pollution:-

(1) organic pollution due to micro-organisms - bacteria, and viruses - present in the water, generated by excrement, animal and vegetable waste.

(2) chemical pollution generated by the nitrates and phosphates of pesticides human and animal drugs, household products, heavy metals, acids and hydrocarbons used in industries.

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Chemistry

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	7-4-22	III - B.Sc	Water pollution

S.NO	Name of the Student	Signature of the Student
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7	N. Reddyppa reddy.	N. Reddyppa reddy
8	N. Sateesh kumar	N. Sateesh kumar
9	P. Ramamohan	P. Ram mohar
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GOVT.DEGREE COLLEGE
RAYACHOTY

Department of chemistry

Name of the student	:	N. Satish Kumar
Group	:	III - BZC
Course	:	B.Sc
Roll No	:	190310633011
Title of the Assignment	:	Water pollution

This is turn results in a great threat to the very existence of life on earth. All the dereloped countries which widely use the CFC's for air-conditioning by now are aware of the situation and are trying to find out safer substitutes for CFC's.

iii) ozone depletion :-

The ozone layers exists at a hight of 1kilo meters and beyond in the strato sphere segment of the atmosphere. the temperature of the stratosphere is around $-55^{\circ}c$ which reduces upto $-2^{\circ}c$ with the increasing altitude. Even though ozone (O_3) is very unstable in the ordinary temperature it is quite stable at very low temperature of the stratosphere.

Scientists have discovered that in the recent years the increased human activity is over crowding the stratosphere with the oxides of nitrogen from nuclear explosions conducted by scientists at various places.

A new places of species compound which deplates the ozone layer was also found to be rapidly polluting the stratosphere namely the chloroflora carbons.

2) Green house effect:-

A Green house is a glass house created in the open to grow plants in it without exposing them to the external temperature in cold countries.

In recent years with the global increase in the carbon dioxide production with the great industrial development and the increase in the population of the present day world. man is subjecting the earth to unlimited deforestation and is increasingly produce a large excess of carbondioxide by burning the carbonaceous fuels. the carbon dioxide produced forms a protective umbrella like the glass house walls. It lets in the solar radiations on to the earth which warm it up but do not permit the infrared and other longer wave length radiations to escape. consequently the earth gets heated up and remains warm and the temperature of earth rises. this is called the green house effect. In effect the "green house effect" is the progressive "global warming."

$SO_2 + H_2O \longrightarrow H_2SO_3$

$NO + NO_2 + H_2O \longrightarrow 2HNO_3$

These reactions are better catalysed by the particulate matter in the atmosphere such as soot and metal oxides. thus the chief acids responsible for the acid rain are sulphuric and nitric acids.

Besides the sulphuric and nitric acids, acid rains also contains HCl gas form natural and anthropogenic sources. the adverse effects of acid rain are many. pure water from a rainfall has the pH around 6.0 to 7.0 due to the dissolved atmospheric CO_2 and natural gases. However acidi rain exhibits a pH 5.00 or much below depending upon the strength of acid involved in its formation. In agriculture acid rains retards the growth of all plants especially the leguminous ones as it effect the nitrogen fixing bacteria.

4 Explain the following

i) Acid rains

ii) Green house effect

iii) Ozone depleciation.

1) i) Acid rains :-

Acid rain is a result of acidic oxides dissolving in water this is due to several industries releasing acid exhaust gases into the atmosphere the oxides responsible for acid rain are the oxides of carbon, Nitrogen and sulphur

Sources of the acidic oxides - Industries using coal and sulphur releases the oxides of carbon and sulphur in large quantities

$C + O_2 \longrightarrow CO_2$; $S + O_2 \longrightarrow SO_2$

SO_2 gets oxidised to SO_3 in the presence of ozone and other gases

$SO_2 + O_3 \longrightarrow SO_3 + O_2$

These oxides interact with rain water to form acids.

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Chemistry

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	24-3-22	III-B.Sc	Acid Rains, Green house effect.

Sl.NO	Name of the Student	Signature of the Student
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GOVT.DEGREE COLLEGE
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Department of chemistry

Name of the student	:	CH. HAJERA
Group	:	3rd B.Z.C
Course	:	B.Sc
Roll No	:	190316633014
Title of the Assignment	:	ACID RAINS & GREEN HOUSE EFFECT.

* NO to plastic bags
* Reduction of forests fires and
* use filters for chimneys
* Avoid using of products with chemicals
* Implement Afforestation

* Most of air pollution comes from energy use and production says John Wake Director of Tec clean air project part of Tec air pollution
* Respiratory and heart problems
* The effect of air pollution are alarming
* Child health problems
* CO on inhalation it passes are alarming lungs into blood stream
* It reacts with heamoglobin (Hb) of RBC forming a stable coordination complex called carboxy hoemoglobin
* If ~~react~~ CO causes difficulty in breathing
* It also causes mental disturbances and irritation of mue membrane
* CO causes dizziness headache cardiac and pulmonary changes

Control :-

* using public transports
* Turn off the lights when not in use
* Recycle and Reuse

like the Sahara the Gobi and Harlamatta are responsible for $PM_{2.5}$ pollution due be the size of the Grains Spread

* Wild fires generate high levels of Pm pollution along with CO and NOX
* Volcanoes release NH_3 and SO_2 during eruptions which can from secondary pm when combined other pollutants in the atmosphere
* Volcanoes release NH_3 and SO_2 during eruption along with CO and ~~NOX~~ in the atmosphere
* Salt from Sea Spray also constitutes as Pm pollution contributing up to 80% of particle levels in coastal areains
* Stationary Sources such as Power plants oil refineries industrial Facilities and factories
* Area Sources, such as agriculture area aries and wood burning fireplaces
* Natural Sources such as wind blown dust wild fires and volcanoes

Effects: Because of air pollution so many effects in nature

3 what is air pollution? Explain its source effects and controls

Ans

Air pollution:-

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings or cause damage to the climate or to materials

Sources:

The major sources of air pollution include

* The combustion of coal oil gas and other fuels for the generation of electricity
* Burning gasoline diesel and other fuels for transportation
* Emission from various industrial processes
* Burning wood and other fuels for heating and cooking
* Agricultural burning land clearing and man made fires
* Natural sources including volcanoes forest fires and dust storms
* Sand and dust storms from deserts

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Chemistry

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	11-3-22	III - B.Sc	Air pollution

Sl. No	Name of the Student	Signature of the Student
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8	N. Sathish kumar	N. sathish kumar
9	T. Ramamohan	T. Ramamohan
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GOVT.DEGREE COLLEGE
RAYACHOTY

Department of chemistry

Name of the student	:	Shaik Yasar
Group	:	Final BZC
Course	:	B.Sc
Roll No	:	1903/06 33 005
Title of the Assignment	:	Air pollution

man for drinking & agriculture in the streams & rivers (0.0001) lake (0.009%) under grown areas (5.625%) & ice caps (2.15%).

ii forest resources:-

forests are the reserves for fire wood grass fruits nuts vegetbles & medicinal herbs besides giving shelter to wild animals having culture heritage.

iii fossil fuels like coal:-

* petrol hydrocarbons & natural gas produce non-renewable types of energy fire wood & wood provide non-renewable types of energy.

* coal is the buried from of trees enlaged in soil layers during earth quakes our country.

* oil & natural gas comission has been involved in extracting these underground oils.

iii. Tidal energy:

waves, tides of oceans are continous this can be converted into electrical energy (or) mechanical energy

Atomic or Nuclear energy:

The energy obtained in the nuclear reactions (fission & fusion) is known as Atomic energy.

Non-Renewable Resources:

These cannot be renewed once they are used. The land area, minerals oceanic underground resources fossil oils, coal etc.

it is estimated that the energy utilization will be develop double once in 40 years at the current rate of population growth.

Water resources:

Through water appears to be plenty in our surrounding as we see it seas only 2.7% is available to

a. Renewable Resources:-

forests, grasslands wild life aquatic organisms & water constitute both renewable & non renewable resources. Judicious use of these resources help in their conservation & continious availability. in discriminate use of these resources to fall fill the temperory selfish needs may result in total disappearence with in no time though they are renewable

i. solar energy:-

This is the major energy source for the production of vegetation which serves as food & fuel for mankind. it can be used for cooking using solar cookers efforts are being made to convert solar energy into electrical energy

ii. wind energy:-

wind currents can also be harvested into mechanical energy for uplifting water form the well of rivers This devices used for this purpose called mills.

2. What are natural resources? Explain there classification & renewable & non-renewable resources?

Food shelter & reproduction & the primary requirements for any organism to live along with them water, air, light, temp & nutrients are also necessary most of these abiotic factors constitute the energy resources & are available in nature.

There utility increases with the increases in population. Total depletion of these resources may lead to the death of the organisms.

Energy resources of our country :-

Natural energy resources may be broadly divided into two types.

1. Renewable Resources
2. Non-renewable resources.

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Chemistry

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	[illegible]2022	III BZC	[illegible]

S.NO	Name of the Student	Signature of the Student
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4	S. Irshad	S. Irshad
5	B. Ragavulu	B. Ragavulu
6	B. Saikumar	B. Sai kumar
7	M. Reddeppareddy	M. Reddeppareddy
8	N. Satheesh kumar	N. Satheesh kumar
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Signature of the Lecturer

Signature of the Department I/C

GOVT.DEGREE COLLEGE
RAYACHOTY

Department of chemistry

Name of the student	:	S. Irfan basha
Group	:	BZC IIIrd year
Course	:	BSc
Roll No	:	190310633003
Title of the Assignment	:	Renewable - non-renewable sources

GOVERNMENT DEGREE COLLEGE

RAYACHOTY – 516269, ANNAMAYYA DISTRICT. (A.P.)

DEPARTMENT OF HISTORY.

(UG courses)

Assignment Topic

Freedom Movement in India.

Topic Submitted
BY

Name of the Student : A.S. Hussain.

Class : IInd B.A.

Date : _____

Academic Year: 2021- 2022.

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF History

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
		IInd and IIIrd	Freedom Movement in India.

Sl. NO	Name of the Student	Signature of the Student
1	M. Vijay Kumar	M. Vijay Kumar
2	A. Prabha Kara	A. Prabha Kara
3	Shaik. Abdulla	S. Abdulla
4	P. Afridi Khan	P. Afridi Khan
5	P. Fardeen khan	P. Fardeen Khan.
6	S. Akram	S. Akkram
7	P. Irfan	P. Irfan
8	S. Manjunadha	S. Manjunatha
9	A. Mahesh naidu	A. Mahesh naidu
10	V. Anusha	V. ANUSHA
11	N. Sivaiah	N. Sivaiah
12	D. Eswara	D. Eswara
13	G. Arun kumar	G. Arun Kumar
14	S. Malik basha	S. Malik basha
15	N. Siva Prasad	N. Siva Prasad
16	A. Mohammed thanveer	A. mohammed thanveer.
17	J. Sudharshan	J. Sudharshan
18	A. Reddy krishna	A. Reddy krishna.
19	K. Gayathri	K. Gayathri
20	Y. Kiran kumar	Y. Kiran Kumar
21	C. Kumar Swami	C. Kumar Swami
22	M. Shravani	M. Shravani
23	S. Imran	S. Imran
24	V. Jaya Simha	V. Jaashua
25	N. Anji kumar yadav	N. Anji Kumar Yadav
26	M. Devaj Naik	M. Devaj Naik
27	M. Sai kumar naik	M. Sai Kumar naik
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K. Guru
Signature of the Lecturer

K. Guru
Signature of the Department I/C

GOVT. DEGREE COLLEGE: RAYACHOTY

DEPARTMENT OF Mathematics

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
	16/7/2024	IIMPCs	Rank of a Matrix

Sl. NO	Name of the Student	Signature of the Student
1	C. Tirumalesu	Tirumalesu
2	D. PRASANNA JYOTHI	Prasanna Jyothi
3	D. PAVAN KUMAR	Pavan Kumar
4	G. VENKATA TARUN	Venkata Tarun
5	K. BHAGYAREKHA	Bhagyarekha
6	K. MANJUNADHA	Manjunadha.
7	K. BHANU PRAKASH	Bhanuprakash
8	M. SAI	Sai
9	M. DAMODARA	Damodara
10	P. NANDAKUMAR REDDY	Nandakumar reddy
11	P SATISH KUMAR	Satish Kumar
12	S. SREEDHAR REDDY	Sreedhar reddy
13	S. KHADER BASHA	S. Khader Basha
14	S. MOHAMMAD JABEED	S. Md. Jabeed
15	S. SUHEL	Suhel
16	S. ABDUL MAHAMMAD	Abdul Mahammad
17	S. MAZEEDA	Mazeeda
18	S. MUNEERA	Muneera
19	T. TIRUMALESH	T. Tirumalesh
20	V. NAGESWARA	Nageswara
21	V. ADI	Adi.
22	Y. GANESH.	Y Ganesh.
23		
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Signature of the Lecturer

Signature of the Department I/C

GOVERNMENT DEGREE COLLEGE

RAYACHOTY – 516269, ANNAMAYYA DISTRICT. (A.P.)

DEPARTMENT OF Mathematics

(UG courses)

Assignment Topic

RANK OF A MATRIX

Topic Submitted
BY

Name of the Student : M. SAI

Class : II M.P.C.S

Date : 16/07/2022

Academic Year: 2021 – 2022

i) $\Rightarrow -7x-6y+23=0 \quad \rightarrow (i)$

$-20y-40z=0$ i.e $y+2z=0 \quad \rightarrow (ii)$

Let $z=k \ (\neq 0)$

(ii) $\Rightarrow 7x=-6y+2z$

$\Rightarrow 7x=-6(-2k)+2k=14k$

$\boxed{\therefore x=2k}$

$\therefore$ Eigen vectors corresponding to ei

given by $X=\begin{bmatrix} x \\ y \\ z \end{bmatrix}=k\begin{bmatrix} 2 \\ -2 \\ 1 \end{bmatrix}$ where k

i) $\Rightarrow 5x-6y+2z=0$

$\Rightarrow 5x=6y-2z$

$\Rightarrow 5x=6(-k/2)-2k$

$\Rightarrow 5x=-3k-2k$

$\Rightarrow 5x=-5k$

$\Rightarrow \boxed{x=-k}$

$\therefore$ Characteristic vectors corresponding to the characteristic root '3' are given by $X=\begin{bmatrix}x\\y\\z\end{bmatrix}=k\begin{bmatrix}-1\\-2\\1\end{bmatrix}$ where k is non-zero parameters.

Case-(iii): Let $\lambda=15$

Characteristic vectors corresponding to the characteristic root 15 are given by $(A-15I)X=0$

$$\Rightarrow \left\{\begin{bmatrix}8&-6&2\\-6&7&-4\\2&-4&3\end{bmatrix}-\begin{bmatrix}15&0&0\\0&15&0\\0&0&15\end{bmatrix}\right\}\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$$

$$\Rightarrow \begin{bmatrix}-7&-6&2\\-6&-8&-4\\2&-4&-12\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$$

$$\Rightarrow \begin{matrix}7R_2-6R_1\\7R_3+2R_1\end{matrix}\sim\begin{bmatrix}-7&-6&2\\0&-20&-40\\0&-40&-80\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$$

$$\Rightarrow R_3-2R_2\sim\begin{bmatrix}-7&-6&2\\0&-20&-40\\0&0&0\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$$

$\Rightarrow -7x-6y+2z=0$ —(i)

$-20y-40z=0$ i.e $y+2z=0$ —(ii)

Let $z=k\ (\neq 0)$

(ii) $\Rightarrow y+2z=0 \Rightarrow y=-2z=-2k$ $\boxed{\therefore y=-2k}$

$\Rightarrow 2x = 4k - 3k$

$\Rightarrow 2x = k$

$\Rightarrow \boxed{x = k/2}$

$\therefore$ Characteristic vectors corresponding to the characteristic root "0" are given by $X = k\begin{bmatrix} 1/2 \\ 1 \\ 1 \end{bmatrix}$ where k is non-zero parameters.

Case(ii): Let $\lambda = 3$ characteristic vectors corresponding the characteristic root 3 are given by $(A - 3I)X = 0$

$$\Rightarrow \left\{\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix} - \begin{bmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{bmatrix}\right\}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} 5 & -6 & 2 \\ -6 & 4 & -4 \\ 2 & -4 & 0 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\begin{matrix} 5R_2 + 6R_1 \\ 5R_3 - 2R_1 \end{matrix} \sim \begin{bmatrix} 5 & -6 & 2 \\ 0 & -16 & 8 \\ 0 & -8 & -4 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$2R_3 - R_2 \sim \begin{bmatrix} 5 & -6 & 2 \\ 0 & -16 & -8 \\ 0 & 0 & 0 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$\Rightarrow 5x - 6y + 2z = 0 \quad \text{---(i)}$

$-16y - 8z = 0 \quad \text{---(ii)}$

Let $z = k (\neq 0)$

(ii) $\Rightarrow -16y - 8z = 0$

$\Rightarrow -16y = 8z$

$\Rightarrow -16y = 8k$

$\boxed{y = -\frac{1}{2}k}$

$\Rightarrow \lambda[(-\lambda+15)(\lambda-3)]=0$

$\Rightarrow \lambda = 0, 3, 15$

The characteristic roots of A are 0, 3, 15.

Case (i) :-

Let $\lambda=0$ characteristic vectors corresponding to the characteristic root '0' are given by $(A-0I)X=0$.

$$\Rightarrow \begin{bmatrix} 9 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$R_1 \leftrightarrow R_3 \sim \begin{bmatrix} 2 & -4 & 3 \\ -6 & 7 & -4 \\ 9 & -6 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\begin{matrix} R_2+3R_1 \\ R_3-4R_1 \end{matrix} \sim \begin{bmatrix} 2 & -4 & 3 \\ 0 & -5 & 5 \\ 0 & 10 & -10 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$R_3+2R_2 \sim \begin{bmatrix} 2 & -4 & 3 \\ 0 & -5 & 5 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$\Rightarrow 2x-4y+3z=0$ (i)

$-5y+5z=0 \Rightarrow$ (ii)

Let $z=k \ (\neq 0)$

(ii) $\Rightarrow -5y+5z=0$

$\Rightarrow 5y=5z$

$\Rightarrow y=z$

$\Rightarrow \boxed{y=k}$

(i) $\Rightarrow 2x-4y+3z=0$

$\Rightarrow 2x=4y-3z$

$$\Rightarrow x = 8 + \left[\frac{-5+6k_1+2k_2}{5}\right] - 2k_1 - k_2$$

$$\Rightarrow x = \frac{10-5+6k_1+2k_2-10k_1-5k_2}{5}$$

$$\Rightarrow x = \frac{5-4k_1-3k_2}{5}$$

$$\therefore X = \begin{bmatrix} x \\ y \\ z \\ t \end{bmatrix} = \begin{bmatrix} +1 \\ -1 \\ 0 \\ 0 \end{bmatrix} + k_1 \begin{bmatrix} -4/5 \\ 6/5 \\ 1 \\ 0 \end{bmatrix} + k_2 \begin{bmatrix} -3/5 \\ 2/5 \\ 0 \\ 1 \end{bmatrix}$$

5) Find the characteristic roots and the corresponding characteristic vectors of the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.

Sol: Given matrix is $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$

The characteristic equation of A is $|A - \lambda I| = 0$

$$\Rightarrow \begin{vmatrix} 8-\lambda & -6 & 2 \\ -6 & 7-\lambda & -4 \\ 2 & -4 & 3-\lambda \end{vmatrix} = 0$$

$$\Rightarrow (8-\lambda)\left[(7-\lambda)(3-\lambda)-8\right] - (-6)\left[-6(3-\lambda)+8\right] + 2\left[24-2(7-\lambda)\right] = 0$$

$$\Rightarrow (8-\lambda)(21-10\lambda+\lambda^2-16) + 6(-18+6\lambda+8) + 2(24-14+2\lambda) = 0$$

$$\Rightarrow (8-\lambda)(\lambda^2-10\lambda+5) + 6(6\lambda-10) + 2(2\lambda+10) = 0$$

$$\Rightarrow 8\lambda^2 - 80\lambda + 40 - \lambda^3 + 10\lambda^2 - 5\lambda + 36\lambda - 60 + 4\lambda + 20 = 0$$

$$\Rightarrow -\lambda^3 + 18\lambda^2 - 45\lambda = 0$$

$$\Rightarrow \lambda(-\lambda^2 + 18\lambda - 45) = 0$$

$$\Rightarrow \lambda(-\lambda^2 + 15\lambda + 3\lambda - 45) = 0$$

$$\Rightarrow \lambda\left[\lambda(-\lambda+15) - 3(-\lambda+15)\right] = 0$$

4) Solve $x-y+2z+t=2$, $3x+2y+t=1$, $4x+y+2z+2t=3$.

Sol: Given equations $x-y+2z+t=2$, $3x+2y+t=1$, $4x+y+2z+2t=3$

The system can be expressed as

$$\begin{bmatrix} 1 & -1 & 2 & 1 \\ 3 & 2 & 0 & 1 \\ 4 & 1 & 2 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ t \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix} \quad \text{i.e } AX = B$$

Reducing to echelon form

$$\begin{matrix} R_2 - 3R_1 \\ R_3 - 4R_1 \end{matrix} \sim \begin{bmatrix} 1 & -1 & 2 & 1 \\ 0 & 5 & -6 & -2 \\ 0 & 5 & -6 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ t \end{bmatrix} = \begin{bmatrix} 2 \\ -5 \\ -5 \end{bmatrix}$$

$$R_3 - R_2 \sim \begin{bmatrix} 1 & -1 & 2 & 1 \\ 0 & 5 & -6 & -2 \\ 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ t \end{bmatrix} = \begin{bmatrix} 2 \\ -5 \\ 0 \end{bmatrix}$$

This is in echelon form.

$\rho(A) = 2 = \rho(AB) < \text{no. of variables in } X(4)$

$\therefore AX = B$ has infinity many solutions.

$\Rightarrow x-y+2z+t=2$ — (i)

$\Rightarrow 5y-6z-2t=-5$ — (ii)

Let $z=k_1$, $t=k_2$ where k_1, k_2 are two parameters

ii) $\Rightarrow 5y-6z-2t=-5$

$\Rightarrow 5y-6k_1-2k_2=-5$

$\Rightarrow 5y = -5+6k_1+2k_2$

$\Rightarrow y = \dfrac{-5+6k_1+2k_2}{5}$

i) $\Rightarrow x-y+2z+t=2$

Where $A=\begin{bmatrix}1 & 1 & -1 & -1\\ 1 & -1 & 2 & -1\\ 3 & 1 & 0 & 1\end{bmatrix}$, $X=\begin{bmatrix}x\\y\\z\\t\end{bmatrix}$, $O=\begin{bmatrix}0\\0\\0\end{bmatrix}$

Reducing to echelon form.

R_2-R_1, R_3-3R_1 $\sim\begin{bmatrix}1 & 1 & -1 & 1\\ 0 & -2 & 3 & -2\\ 0 & -2 & 3 & -2\end{bmatrix}\begin{bmatrix}x\\y\\z\\t\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$

R_3-R_2 $\sim\begin{bmatrix}1 & 1 & -1 & 1\\ 0 & -2 & 3 & -2\\ 0 & 0 & 0 & 0\end{bmatrix}\begin{bmatrix}x\\y\\z\\t\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$

This is in echelon form.

$\rho(A)=2 <$ no. of variables in $X(4)$

$\therefore AX=O$ has no zero solutions only.

$\Rightarrow x+y-3+t=0 \rightarrow (i)$

$\Rightarrow -2y+3z-2t=0 \rightarrow (ii)$

Let $z=k_1$, $t=k_2$ where k_1, k_2 are two parameters.

(ii) $\Rightarrow -2y+3z-2t=0$

$\Rightarrow 2y=3z-2t$

$\Rightarrow y=\frac{3k_1+2k_2}{2}$

(i) $\Rightarrow x+y-z+t=0$

$\Rightarrow x=-y+z-t$

$x=-\left[\frac{3k_1-2k_2}{2}\right]+k_1-k_2$

$\therefore x=\frac{-3k_1+2k_2+2k_1-2k_2}{2}=\frac{-k_1}{2}$

$\therefore X=\begin{bmatrix}x\\y\\z\\t\end{bmatrix}=k_1\begin{bmatrix}-1/2\\3/2\\1\\0\end{bmatrix}+k_2\begin{bmatrix}0\\-1\\0\\1\end{bmatrix}$

$R_2 \to R_2 - 2R_3$
$R_4 \to R_4 + 3R_3$

$$\sim \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -4 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 3 \end{bmatrix} = \begin{bmatrix} -1 & 1 & 0 & 0 \\ 1 & -2 & -2 & -2 \\ 0 & 1 & 1 & -1 \\ 0 & 0 & 3 & -2 \end{bmatrix} A$$

$$R_4 \to \frac{R_4}{R_3} \sim \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -4 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -1 & 1 & 0 & 0 \\ 1 & -2 & -2 & -2 \\ 0 & 1 & 1 & -1 \\ 0 & 0 & 1 & -2/3 \end{bmatrix} A$$

$R_1 \to R_1 - R_4$
$R_2 \to R_2 + 4R_4$
$R_3 \to R_3 - 3R_4$

$$\sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -1 & 1 & -1 & 2/3 \\ 1 & -2 & 2 & -2/3 \\ 0 & 1 & -2 & 1 \\ 0 & 0 & 1 & -2/3 \end{bmatrix} A$$

$\Rightarrow I_4 = B \cdot A$ where $B = \begin{bmatrix} -1 & 1 & -1 & 2/3 \\ 1 & -2 & 2 & -2/3 \\ 0 & 1 & -2 & 1 \\ 0 & 0 & 1 & -2/3 \end{bmatrix}$

$\Rightarrow I_4 A^{-1} = (BA) A^{-1}$

$\Rightarrow A^{-1} = B(A \cdot A^{-1})$

$\Rightarrow A^{-1} = B I_4$

$\Rightarrow A^{-1} = B = \begin{bmatrix} -1 & 1 & -1 & 2/3 \\ 1 & -2 & 2 & -2/3 \\ 0 & 1 & -2 & 1 \\ 0 & 0 & 1 & -2/3 \end{bmatrix}$ //

3] Solve $x+y-3+t=0$, $x-y+2z-t=0$, $3x+y+t=0$.

Sol: Given system is $x+y-3+t=0$, $x-y+2z-t=0$, $3x+y+t=0$

This can be expressed as $\begin{bmatrix} 1 & 1 & -1 & 1 \\ 1 & -1 & 2 & -1 \\ 3 & 1 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ t \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$ i.e. $AX = 0$

$R_4 \to R_4 - 2R_3 \sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} = \begin{bmatrix} I_3 & 0 \\ 0 & 0 \end{bmatrix}$

$\therefore \rho(A) = 3$ //

2] Find the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 2 & 2 \\ 1 & 1 & 2 & 3 \\ 2 & 2 & 2 & 3 \\ 3 & 3 & 3 & 3 \end{bmatrix}$

Sol: Given that $A = \begin{bmatrix} 0 & 1 & 2 & 2 \\ 1 & 1 & 2 & 3 \\ 2 & 2 & 2 & 3 \\ 3 & 3 & 3 & 3 \end{bmatrix}_{4\times4}$

Consider $A = I_4 A$

$\Rightarrow \begin{bmatrix} 0 & 1 & 2 & 2 \\ 1 & 1 & 2 & 3 \\ 2 & 2 & 2 & 3 \\ 3 & 3 & 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} A$

$R_1 \leftrightarrow R_2 \sim \begin{bmatrix} 1 & 1 & 2 & 3 \\ 0 & 1 & 2 & 2 \\ 2 & 2 & 2 & 3 \\ 3 & 3 & 3 & 3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} A$

$R_3 \to R_3 - 2R_1$
$R_4 \to R_4 - 3R_1$
$\sim \begin{bmatrix} 1 & 1 & 2 & 3 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & -2 & -3 \\ 0 & 0 & -3 & -6 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & -3 & 0 & 1 \end{bmatrix} A$

$R_1 \to R_1 - R_2 \sim \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & -2 & -3 \\ 0 & 0 & -3 & -6 \end{bmatrix} = \begin{bmatrix} -1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & -3 & 0 & 1 \end{bmatrix} A$

$R_3 \to R_3 - R_4 \sim \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & -3 & -6 \end{bmatrix} = \begin{bmatrix} -1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & -1 \\ 0 & -3 & 0 & 1 \end{bmatrix} A$

Assignment - I

1] Reduce the matrix $A=\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}_{4\times4}$ to normal form and hence find its rank.

Sol: Given matrix $A=\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$

$R_1 \leftrightarrow R_2 \sim \begin{bmatrix} 1 & -1 & -2 & -4 \\ 2 & 3 & -1 & -1 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$

$R_2 \to R_2 - 2R_1$
$R_3 \to R_3 - 3R_1 \sim \begin{bmatrix} 1 & -1 & -2 & -4 \\ 0 & 5 & 3 & 7 \\ 0 & 4 & 9 & 10 \\ 0 & 9 & 12 & 17 \end{bmatrix}$
$R_4 \to R_4 - 6R_1$

$C_2 \to C_2 + C_1$
$C_3 \to C_3 + 2C_1 \sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 5 & 3 & 7 \\ 0 & 4 & 9 & 10 \\ 0 & 9 & 12 & 17 \end{bmatrix}$
$C_4 \to C_4 + 4C_1$

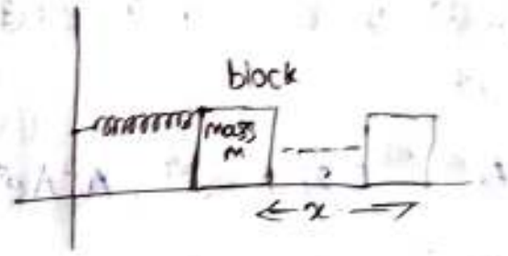
$R_2 \to R_2 - R_3 \sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & -6 & -3 \\ 0 & 4 & 9 & 10 \\ 0 & 9 & 12 & 17 \end{bmatrix}$

$R_3 \to R_3 - 4R_2$
$R_4 \to R_4 - 9R_2 \sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & -6 & -3 \\ 0 & 0 & 33 & 22 \\ 0 & 0 & 66 & 44 \end{bmatrix}$

$C_3 \to \frac{C_3}{33}$
$C_4 \to \frac{C_4}{22} \sim \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 2 & 2 \end{bmatrix}$

2. What is Damped harmonic motion, derivative differential equation for it and find its solution.

Damped harmonic motion:- when a body oscillates in air (or) any other medium the amplitude of oscillations decreases gradually and finally the body comes to rest. This is due to the medium offers frictional force to the body. These oscillations are called Damped harmonic motion. And the body which executes Damped harmonic motion is called Damped harmonic oscillator.



1. Consider a block of mass m attach to a spring and placed on a horizontal surface.
2. If we displace the block by x to the disp right side and two forces acting on it.

$F_{restoring} = -kx$ ——①

$F_{frictional} = -rv$ ——②

Net force $F_{Net} = -kx - rv$

$ma = -kx - rv$

$a = -k/m\,x - \frac{r}{m}v$

GOVERNMENT DEGREE COLLEGE

RAYACHOTY -516269, ANNAMAYYA DISTRICT. (A.P.)

DEPARTMENT OF PHYSICS

(UG courses)

Assignment Topic

What is damped harmonic oscillator? Derive differential equation for it and find solution?

Topic Submitted
BY

Name of the Student : T SREEVIDYA

Class : I M.P.Cs

Date : 05-01-2022

Academic Year: 2021-22

GOVT. DEGREE COLLEGE: RAYACHOTY
DEPARTMENT OF PHYSICS

ASSIGNMENT REGISTER

S.NO	DATE	CLASS	TOPIC
1	05/01/2022	I MPCs	What is damped harmonic oscillator? Derive differential equation for it and find solution?

Sl. NO	Name of the Student	Signature of the Student
1	A. SRAVANI	
2	B REDDI PRASANTHI	
3	G REDDI LOKESH	
4	M FATHIMA MISBHA	
5	M SWATHI	
6	S.SYEDVALLI	
7	T SREEVIDYA	
8	V SIVASANKAR	
9	1.B SANGEETHA	
10	2. K LIKHITHA	
11	3.K ANJENEYULU	
12	4.S.M YOUSUF	

Signature of the Lecturer
05/01/2022

Signature of the Department I/C
05/01/2022

$= e^{-bt}\left[A_1 + A_1 bt + A_2 - A_2 bt\right]$

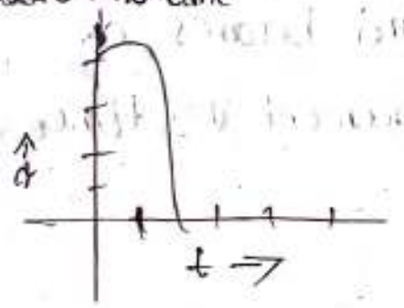
$x = e^{-bt}\left[(A_1 + A_2) + b(A_1 - A_2)t\right]$

Let $A_1 + A_2 = P$; $b(A_1 - A_2) = q$

$\therefore x = e^{-bt}\left[P + qt\right]$

In this case time increase, displacement decreases rapidly and becomes 0.

Displacement V/S time



Ex:- Motion of a pointer exhibit in galvanometer, Ammeter.

Case 3:- $(b^2 < \omega^2)$

Under D.M:-

$x = Ae^{(-b+\sqrt{b^2-\omega^2})t} + A_2 e^{(-b-\sqrt{b^2-\omega^2})t}$

$= A_1 e^{(-b+i\beta)t} + A_2 e^{(-b-i\beta)t}$ $\left[\because \sqrt{b^2-\omega^2} = i\beta \quad \sqrt{\omega^2-b^2} = \beta\right]$

$= e^{-bt}\left[A_1 e^{i\beta t} + A_2 e^{-i\beta t}\right]$

$= e^{-bt}\left[A_1(\cos\beta t + i\sin\beta t) + A_2(\cos\beta t - i\sin\beta t)\right]$ $\left[\because e^{i\beta t} = \cos\beta t + i\sin\beta t \quad e^{-i\beta t} = \cos\beta t - i\sin\beta t\right]$

This is the solution for Damped harmonic oscillator.

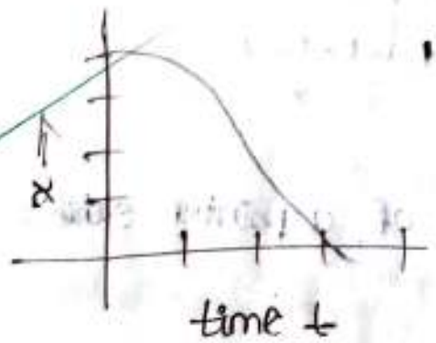
Case-1:- $(b^2 > \omega^2)$

over damped motion:-

when $b^2 > \omega^2$, then $b > \sqrt{b^2-\omega^2}$

* The terms $-b+\sqrt{b^2-\omega^2}$, $-b-\sqrt{b^2-\omega^2}$ both are negative.
* As the time increases, displacement decreases and becomes 0 without any oscillation.
* In this case only the body once displace equilibrium position without performing any oscillations and becomes 0.

Distance Displacement V/s time



Ex:- Motion of pendulum moving in thick oil.

Case-2:- $(b^2 = \omega^2)$

critical damped motion:-

* $b^2 = \omega^2$, $\sqrt{b^2-\omega^2} = h$ (very small number)

$$x = A_1 e^{(-b+h)t} + A_2 e^{(-b+h)t}$$

$$= A_1 e^{-bt} \cdot e^{ht} + A_2 e^{-bt} \cdot e^{-ht} \qquad [\because x >> 1,\ e^x = 1+x]$$

$$= e^{-bt}\left[A_1 \cdot e^{ht} + A_2 e^{-ht}\right]$$

$$= e^{-bt}\left[A_1 \cdot e(1+ht) + A_2(1-ht)\right]$$

$$\frac{d^2x}{dt^2} = -\omega^2 x - 2b\frac{dx}{dt}$$

$$\boxed{\frac{d^2x}{dt^2} + 2b\frac{dx}{dt} + \omega^2 x = 0} \rightarrow (3)$$

This is the differential equation for D.H.O.

Solution for D.H.O:-

Let $x = Ae^{\alpha t} \rightarrow (4)$

differ. equ (4) we get,

$$\frac{dx}{dt} = A.\alpha e^{\alpha t} \rightarrow (5)$$

$$\frac{d^2x}{dt^2} = A\alpha^2 e^{\alpha t} \rightarrow (6)$$

equ (4), (5), (6) sub in equ (3) we get,

$$\Rightarrow A\alpha^2 e^{\alpha t} + 2bA.\alpha e^{\alpha t} + \omega^2 A e^{\alpha t} = 0$$

$$\Rightarrow Ae^{\alpha t}[\alpha^2 + 2b\alpha + \omega^2] = 0.$$

$$\alpha^2 + 2b\alpha + \omega^2 = 0$$

$$\alpha = \frac{-2b \pm \sqrt{4b^2 - 4.1.\omega^2}}{2.1}$$

$$= \frac{-2b \pm 2\sqrt{b^2 - \omega^2}}{2}$$

$$= -b \pm \sqrt{b^2 - \omega^2}$$

$\therefore \alpha_1 = -b + \sqrt{b^2 - \omega^2}$, $\alpha_2 = -b - \sqrt{b^2 - \omega^2}$

$$\therefore \boxed{x = A_1 e^{(-b+\sqrt{b^2-\omega^2})t} + A_2 e^{(-b-\sqrt{b^2-\omega^2})t}}$$

GOVERNMENT DEGREE COLLEGE

RAYACHOTY –516269, ANNAMAYYA DISTRICT. (A.P.)

DEPARTMENT OF COMMERCE

(B.COM ,GEN)

Assignment Topic

TYPES OF BUSINESS ENVIRONMENT

Submitted
BY

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Class :B.COM, I SEMESTER

Date :17-03-2022

Academic Year: 2021-2022

Types of Micro Macro Environment

Defination: The business environment is total of all external things to business of Industrial afects in organization and association.

types of business Environment

1): Internal environment

2) External environment

External environment:

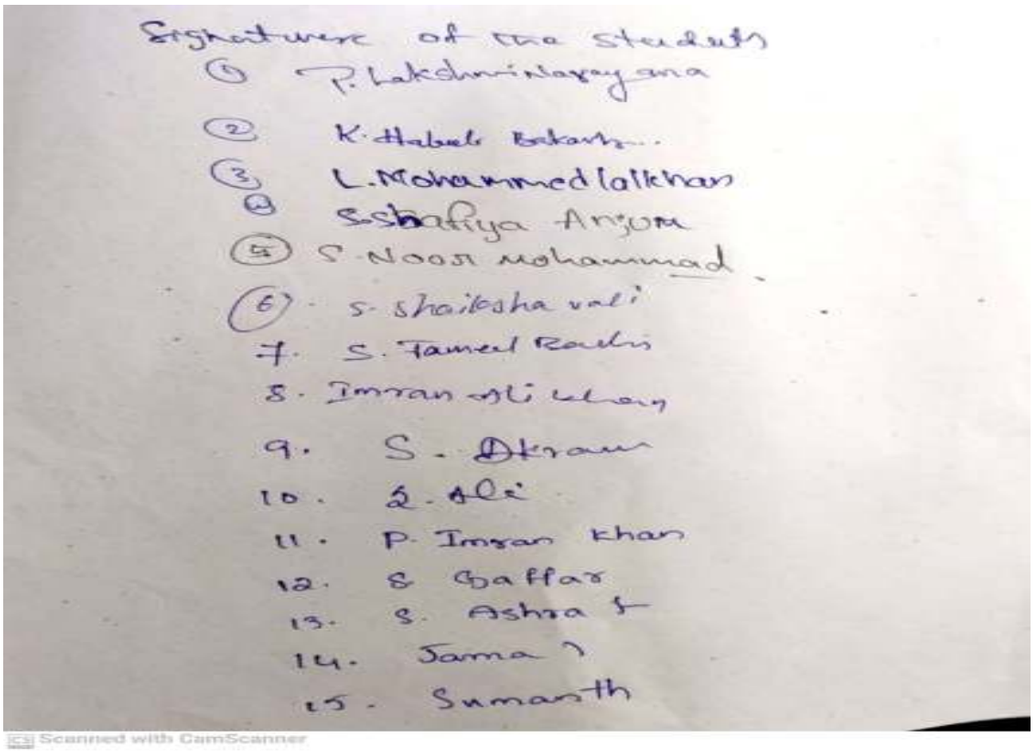
Marco	Mirco.
1. suppliers	1. Economic Environment
2. Intermediaries	2. Political Environment
3. customers	3. social culture environment
4. Financers	4. techological environment
5. publics	5. Global environment
6. competitors	6. Nature environment

structure of economy is three types there are.

1. Primary sector
2. secondary sector
3. Tertiary sector

Primary sector	secondary sector	Tertiary sector
1. Agriculture 2. Mining 3. Forest 4. Fisheries 5. Animal husbandry	1. small scall Industries 2. large scale Industries	1. Power 2. Transport and communication 3. Internal and International 4. Banking and finace 5. other services

Economic Reforms refer to the fundamental changes that were lunched with the plan of liberalising the economy and to quicken its rate of economic. Narasimha Rao goverment in 1991 started the economic reforms in order internal and external faith in the Indian economy.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