

Gokak Education Society's

**J.S.S. Degree Arts, Science,  
Commerce And Post  
Graduate College**

**GOKAK-591307.**

Dist : Belgaum State : Karnataka

ಜೆ.ಎಸ್.ಎಸ್. ಪದವಿ ಕಲಾ, ವಿಜ್ಞಾನ,  
ವಾಣಿಜ್ಯ ಹಾಗೂ ಪ್ಲಾತಕೋತ್ತರ  
ಮಹಾವಿದ್ಯಾಲಯ, ಗೋಕಾಕ.



- B.A \_\_\_\_\_ Semester     B.Com \_\_\_\_\_ Semester  
 B.Sc IV Semester     B.B.A \_\_\_\_\_ Semester

**Academic Year 20 21 -20 22**

**HOME ASSIGNMENTS / SEMINARS**

Subject Mathematics P-II

No. & Name of the Paper \_\_\_\_\_

Name of the Student Sandeep S. Chippalakatti

Class B.Sc - IV Division \_\_\_\_\_

Roll No. \_\_\_\_\_

R.C.U. Belagavi Examination No. 51917186

NAME		TOTAL MARKS
CLASS	SUBJECT	
ROLL NO.	DATE	

1) Explain briefly Iteration method to find the real root of  $f(x) = 0$

→ To find root of the equation

$$f(x) = 0 \rightarrow (1)$$

we written this equation in the form

$$x = \phi(x) \rightarrow (2)$$

we now find an approximate value of the desired root. Let this value of the root be  $x_1$  such that:

$$|\phi'(x_1)| < 1 \rightarrow (3)$$

then we substitute this in  $\phi(x)$  to get a b/w approximation  $x_2$  given by the eqn

$$x_2 = \phi(x_1) \rightarrow (3)$$

put  $x = x_2$  in  $\phi(x)$  we get next approximation  $x_3$

$$x_3 = \phi(x_2) \rightarrow (4)$$

continuing the above process the successive approximation

$$x_3 = \phi(x_2)$$

$$x_4 = \phi(x_3)$$

⋮

$$x_n = \phi(x_{n-1}) \quad n = 1, 2, 3, \dots \rightarrow (5)$$

2) With w.d. notation prove that  $E\Delta = \Delta E$

$$\begin{aligned} \rightarrow E[\Delta f(x)] &= E[f(x+h) - f(x)] \\ &= E f(x+h) - E f(x) \\ &= f(x+h) - f(x) \\ &= \Delta f(x) \end{aligned}$$

$$E\Delta f(x) = \Delta[E f(x)]$$

$$E\Delta = \Delta E$$

3) Prove that  $\Delta \nabla = \nabla \Delta$

$$\begin{aligned} \rightarrow \text{Let } \Delta \nabla f(x) &= \Delta(\nabla f(x)) \\ &= \Delta\{f(x) - f(x-h)\} \\ &= \Delta f(x) - \Delta f(x-h) \\ &= \Delta f(x) - \{f(x) - f(x-h)\} \\ &= \Delta f(x) - \nabla f(x) \end{aligned}$$

$$\Delta \nabla f(x) = (\Delta - \nabla) f(x)$$

$$\Rightarrow \Delta \nabla = (\Delta - \nabla)$$

$$\text{or } \Delta - \nabla = \Delta \nabla$$

4) With usual notation  $\nabla = E^{-1} \Delta$

$$\rightarrow \nabla f(x) = f(x) - f(x-h)$$

$$f(x-h) = f(x) - \nabla f(x)$$

$$= (1 - \nabla) f(x)$$

$$f(x-h) = E^{-1} f(x)$$

$$\nabla f(x) = f(x) - f(x-h)$$

$$= \Delta f(x-h)$$

$$= \Delta E^{-1} f(x)$$

5) With usual notation  $E = 1 + \Delta$

$$\rightarrow \text{Consider } \Delta f(x) = f(x+h) - f(x)$$

$$\Rightarrow \Delta f(x) + f(x) = f(x+h)$$

$$f(x+h) = f(x) + \Delta f(x)$$

$$f(x+h) = (1 + \Delta) f(x)$$

$$E f(x) = (1 + \Delta) f(x)$$

$$\Rightarrow E = 1 + \Delta \text{ or } \Delta = E - 1$$

6) Write the formula to find the first derivative using the forward difference

$$\rightarrow \Delta y_r = y_{r+1} - y_r \quad r=0, 1, 2, 3$$

7) Evaluate  $\Delta^n (1-ax) (1-bx^2) (1-cx^3) (1-dx^4)$  where  $h=1$

$$\rightarrow \Delta^n f(x) = 0, n! h^n$$

$$= (a)(-b)(-c)(-d) \text{ to } (a)^n$$

$$= abcd \text{ to } 1^n$$

$$= 1^n abcd$$

8) Explain briefly bisection method to find real root of  $f(x) = 0$

$\rightarrow$  Consider a continuous function  $f(x)$  defined on  $[a, b]$

If  $f(a) f(b) < 0$  then the real root of  $f(x)$  lies b/w  $[a, b]$  & it is divided by

$$x_1 = \frac{a+b}{2}$$

i.e. 1<sup>st</sup> approximation is  $x_1 = \frac{a+b}{2}$

Again if  $f(a) f(x_1) < 0$  or  $f(x_1) f(b) < 0$  then the root lies b/w the interval  $[a, x_1]$  or  $[x_1, b]$  & it is divided by  $x_2 = \frac{a+x_1}{2}$  or  $x_2 = \frac{x_1+b}{2}$

similarly we find roots of  $x_2$  such that  $x_3 = \frac{x_1+x_2}{2}$  or  $x_3 = \frac{x_2+x_1}{2}$  in  $[x_1, x_2]$  or  $[x_2, x_1]$

continue this process until we get the root of desired degree of accuracy.

Find the real root of  $x^3 - 4x - 9 = 0$  in  $[2, 3]$  by bisection method in two stages.

$$\text{Given } f(x) = x^3 - 4x - 9 = 0 \rightarrow \text{①}$$

Then by trial b Error

$$f(2) = 2^3 - 4(2) - 9 = -9$$

$$f(3) = 3^3 - 4(3) - 9 = 6$$

Therefore  $f(2)$  is negative &  $f(3)$  is +ve. so  $f(2), f(3) < 0$ . Hence root lies in  $[2, 3]$ .

$$x_1 = \frac{2+3}{2} = \frac{5}{2} = 2.5$$

$$f(2.5) = (2.5)^3 - 4(2.5) - 9$$

$$= 15.625 - 10 - 9$$

$$= 15.625 - 19$$

$$f(2.5) = -3.375$$

The root lies b/w 2.5 & 3

$$x_2 = \frac{2.5+3}{2} = 2.75$$

$$f(2.75) = (2.75)^3 - 4(2.75) - 9$$

$$= 20.796 - 11 - 9$$

$$= 20.796 - 20$$

$$f(2.75) = 0.796$$





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Semester Academic Year : 20 21 -20 22

Sl. No.	Date	Name of Topic	Signature of the Teacher
1.	4/01/2022	Solved question papers	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Certificate

Date 05/01/2022

This is certify that Mr/Miss Sandeep. S. Chippalakutti

of B.Sc - II<sup>th</sup> Class

has submitted the home Assignments/Seminar Paper and  
his/her performance is satisfactory.

Marks Awarded 03

Signature of the  
Teacher

Signature of the  
H.O.D

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B.A \_\_\_\_\_ Semester     B.Com \_\_\_\_\_ Semester  
 B.Sc V Semester     B.B.A \_\_\_\_\_ Semester

Academic Year 2021 -2022

### HOME ASSIGNMENTS / SEMINARS

Subject History - II

No. & Name of the Paper \_\_\_\_\_

Name of the Student Ashwini . V . Uppan

Class B.S.C V / VI Division \_\_\_\_\_

Roll No. \_\_\_\_\_

R.C.U. Belagavi Examination No. 51917032



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V

**Semester**

**Academic Year : 2021**

**-2022**

Sl. No.	Date	Name of Topic	Signature of the Teacher
1.	17/1/22	Solved Question Paper	
2.			
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12.			

**Certificate**

Date \_\_\_\_\_

This is certify that Mr/Miss Ashwini, V.

Uppan

of B.S.C V Class

has submitted the home Assignments/Seminar Paper and

his / her performance is satisfactory.

Marks Awarded 3



NAME		TOTAL MARKS
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ROLL No	DATE	

6) Define autecology  
The ecological study of particular species  
e. it is also called species ecology  
the study of the interactions of an individual organism or single species

- 7) Name the five master horizons of soil profile
- O - Horizons
  - A - Horizons (Topsoil or Biomental)
  - E - Horizon (Leaching layer)
  - B - Horizon (Sub soil)
  - C - Horizon (Saprolite)
  - R - Horizon (Bed rock)

Q. II. Answer the following questions

1) Explain Water Cycle.

→ Water from different water sources from the land gets evaporated & collects in form of clouds & then it falls back to earth in the form of rain or snow. This cycle of water from land to atmosphere and again back to the land is called the water cycle.

→ The global water cycle can be described with nine major physical processes which form a continuum of water moment they are.

- Evaporation
- Condensation
- Precipitation
- Interception
- Infiltration
- Recalation
- Transpiration
- runoff
- Storage

2) Evaporation

→ Evaporation occurs when the physical state of water is changed from a liquid state to a gaseous state.

→ Typically solar radiation and other factors such as air temperature, vapour pressure, wind and atmospheric pressure affect the amount of natural evaporation that take place in any geographic area.

→ Evaporated moisture is lifted into the atmosphere from the ocean, land surface water bodies as water vapour always exists in the atmosphere.

3) Condensation

→ Condensation is the process by which water vapour changes its physical state from a vapour most commonly to a liquid.

→ Water vapour condenses into small airborne particles to form droplets or clouds.

→ Condensation is brought about by cooling of the air or by increasing the amount of vapour in the air to its saturation point.

4) Precipitation

→ Precipitation is the process that occurs when any & all forms of water particles fall from the atmosphere & reach the ground.

→ The maximum water-bearing air at certain temperature & pressure is called saturated temperature.

→ At saturation point if temperature is lowered condensation of water vapour in form of rain, dew, frost, sleet, snow etc. take place this is called precipitation. These are two sub-processes that cause clouds to release



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III Semester Academic Year : 20<sup>21</sup> -20<sup>22</sup>

Date	Name of Topic	Signature of the Teacher
19/2/22	Mechanism of semiconservative DNA replication Gene regulation in Eukaryotes RMO's & Note on BT plants Monoclonal antibodies Synthesis	



Date \_\_\_\_\_

This is certify that Mr/Miss Ashwini . V . Uppe

SLG17032

of B. S. C III Class

has submitted the home Assignments/Seminar Paper and  
his / her performance is satisfactory.

Marks Awarded 3



## Mechanism of gene regulation

### ① Modified of DNA

a) Chemical modification:- It is done by methylation of DNA it mean that addition of methyl group to the DNA. DNA is typically methylated by methyl transferase enzyme. methylated DNA are changed to wait.

② Transcriptional regulation:- These mechanisms prevent mRNA from being synthesized.

#### a) Presence of Heterochromatin:-

→ Presence of Heterochromatin results in regulation of gene activity because it is a tightly wound DNA due to this RNA pol could not able to move on the gene thus there is no occurrence of protein synthesis.

b) Presence of Euchromatin:- Shows gene activity because it is not tightly wound, here DNA pol can easily move on the gene which results in protein synthesis.

③ Post transcriptional regulation:- Alternative RNA splicing. produce variations in the mRNA which results in blocking of protein synthesis.

④ Translational regulation:- Prevent the synthesis of protein.

Preventing RNA from attaching to ribosome for the proper attachment of mRNA to the ribosome all requires some initiation factors. if there is a absence of those factors thus the process will be stopped.

⑤ Post-translation regulation:-

① Protein activation:- Some proteins are not active when they are formed. They must undergo modification such as folding, cleavage & bond formation.

Ex:- Proinsulin is a precursor for the hormone insulin. It must be cleaved into two polypeptide bonds & some amino acids must remove.

### Advantages of gene regulation

- Conserve Resources
- Respond to environmental changes
- Make different type of cells.

⑥ What are GMO's? Write a note on BT plants.

→ A genetically modified organism (GMO) is an animal, plant or microbe whose DNA has been altered using genetic engineering techniques.

BT Plants:- BT crops are transgenic crops that produce the same toxin as the bacterium *Bacillus thuringiensis* in the plant cell, thereby protecting the crop from pests.

→ The bacterium secretes specific proteins known as "Cry proteins" that are toxic to insects.

A few of the BT crops include cotton, brinjal and etc.

→ When an insect feeds on the transgenic plants, the toxic cry protein present in the plants crystallizes the digestive system of insects, eventually leading to its death. However, it has no harmful effects on the human digestive system.

#### \* *Bacillus thuringiensis* :-

*Bacillus thuringiensis* is a gram-positive, spore forming bacteria which is mainly found in the soil. As stated above, it produces proteins that are toxic to insects.

→ Organic farmers use this bacterium in solution & spray it on the plants to protect them from pests.

→ *Bacillus thuringiensis* is gram positive.

#### 4. Write a Note on monoclonal antibodies Synthesis

Monoclonal antibodies are artificially engineered in laboratories by scientists as a form of medication.

→ This is because they are characterized by their ability to help a human body combat viral infections better. These can target only one specific type of antigen.

→ The shoot - for there is mabs, the body responds by producing antibodies to counteract viruses or antigens, when ever a person falls ill.

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These antibodies are specific to a particular antigen. Therefore, scientists can replicate antibodies & help in the treatment of a disease.

#### \* Synthesis of monoclonal antibodies :-

→ Commonly monoclonal antibodies are produced by the fusion of myeloma cells with the spleen cells. For this purpose, mouse is used as an experimental animal in which the specific antigen is injected for which antibody can be produced.

→ A special chemical polyethylene glycol is used to fuse B cells with the myeloma cells already present in the culture. These cells can also be fused with electroporation, a method in which pores are produced in the cell membrane.

→ The mixture of the cells is cloned & diluted. The clones are gotten from the single parent cells. The antibodies which will produce as a result, they will analyze to see if they have the ability to bind to the antigen.

→ For this purpose different tests are performed like ELISA, immunodot blot or antigen microarray assay. The clone which shows best results is saved & used for the future purposes.

✓ Valid  
P: 6  
11/12/22