



K.L.E. SOCIETY'S  
P. C. JABIN SCIENCE COLLEGE  
HUBBALLI  
AUTONOMOUS

Semester - I

B.Sc.



B.C.A.

M.Sc.

Answer Booklet No.

38662

Theory Semester End  
Examination

April/May 20

Nov./Dec. 20

Certified that the entries made by the candidate  
are found to be correct.

*Hospet*  
14/3/02

Signature of the Room Supervisor with Date

am. Reg. No. ' 1 2 1 C B 0 1 3

Class : B.Sc-I Subject : BOTANY Subject Code No. 118DSC01T-I-22

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## IMPORTANT INSTRUCTIONS TO CANDIDATES

- 1) On the cover page of answer book compulsorily mention your Register Number, Subject, Course Code and required information.
- 2) Don't write your name or mark any signs, such answer scripts shall not be assessed and punished.
- 3) Write your answer from 1<sup>st</sup> page and don't leave any blank pages and blank space in between.
- 4) Last page is meant for rough work and on completion put cross mark (x)
- 5) The candidates are informed strictly to write their answer only with black ink & write on both sides of the answers sheets.

## IMPORTANT INSTRUCTIONS TO CANDIDATES

- 6) Please mention the Question number in the margin. Answer's without Question number & also with wrong question number shall not be valued.
- 7) The students are informed to take compulsorily the signature of the room supervisor with date on the answer book.
- 8) The candidate should be present 20 minutes before the commencement of the examination. After that no students will be allowed in the examination hall.
- 9) Use of any electronic gadgets in the examination hall is strictly prohibited.
- 10) After the last warning bell, no candidate is allowed to leave his/her seat.
- 11) Indulging in different ways and using different means that lead to malpractice is prohibited.
- 12) Don't fold the answers sheets & keep the answer sheets clean.



ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ  
Question No.

ಉತ್ತರವನ್ನು ಇಲ್ಲಿಂದ ಆರಂಭಿಸಿ  
START WRITING ANSWER FROM HERE BELOW

## PART-I

2. a) The fungi that require more than one host organism to complete its parasitic life-cycle are called heteroecious fungi.  
Eg- Puccinia graminis.  
\* They produce 5-different kinds of spores throughout their life cycle.

2. b) Asexual reproduction in Rhizopus takes place by two means.

i) Formation of Aplanospores

- \* Aplanospores are produced by Rhizopus in favourable conditions. These are also called Sporangiospores / sporangia.
- \* Sporangioophores are the long, erect hyphal branches that arise from any cell of the mycelia. These are the spore bearing structures.
- \* Due to the accumulation of protoplast at the tip of sporangioophore, there is swelling.
- \* Spherical, non-motile, cellular spores are produced as a result.
- \* The upper portion of sporangioophore now has a central vacuolated sterile region called columella and outer spongiferous fertile region.
- \* These non motile spores break out in the wind or rain, the columella sheds which results in burst open of spongiferous region to release them.



- \* After finding a suitable substratum, these spores germinate.

### ii) Formation of chlamydo-spore

- \* Chlamydo-spores are produced during unfavourable condition.
- \* These are formed by the septation of the mycelia.
- \* Since these spores are dormant, they remain alive for a long time.
- \* Onset of favourable condition, they germinate on suitable substratum to form new mycelium.

2.c) Puccinia graminis is a parasite that cause brown rust / stem rust disease in wheat plants.

Since it is a heterocyclic fungi and has a macrocyclic life cycle, it requires two hosts to complete its life cycle.

- |                               |                            |
|-------------------------------|----------------------------|
| 1) Uredinal stage             | } 1° host - wheat plant    |
| 2) Telial stage               |                            |
| 3) Basidial stage             |                            |
| 4) Spermial / pycnidial stage | } 2° host - Barberry plant |
| 5) Aecidial stage.            |                            |



### 1) UREDINAL STAGE:-

- \* The aeciospores produced on lower leaf surface of Barberry leaves germinate on the wheat leaves only (Primary host).
- \* On germination, dikaryotic mycelia grows in the intercellular regions in the leaf.
- \* Uredosori are the spore bearing structure that grow in groups in the subepidermal region. Uredosores are stalked, binucleate spores.
- \* Due to pressure created by the numerous spores, epidermal cells break open showing brick red powdery pustules.
- \* These are the uredosores. These uredosores germinate on other wheat plants and this continues several times in a season.

### 2) TELIAL STAGE:-

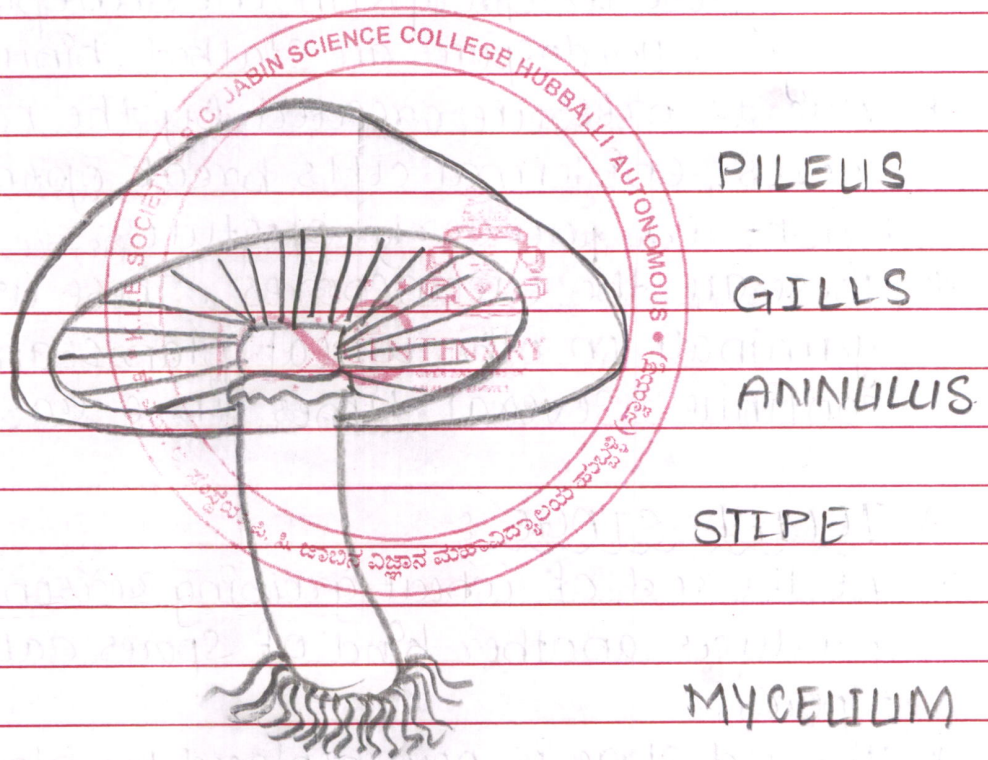
- \* At the end of wheat growing season, uredosori produces another kind of spores called Teleuto-spores.
- \* The red stage is now replaced by black/brown coloured teleutospores. They are spindle shaped, binucleate unicellular spores, brown in colour.
- \* These spores also germinate on wheat plants and appear as dark brown patches on leaves and stem.
- \* Teleutosori produces another kind of spores called basidiospores. These are small spherical spores produced at tip of teleutosori. They germinate on barberry leaf only.



## PART - II.

- 3 a) The organisms (fungi) that show the characteristics of both Protists and Mycota are called Allied fungi.  
Allied fungi shows intermediate characters of both fungi and bacterias.

3. b)



- ★ Structure of mature basidiocarp.  
Agaricus is a saprophyte that grows in dark moist places. The mature basidiocarp has three regions.
- Stipe
  - GILLS
  - PILEUS.



a) STIPE :- It is the long ~~diameter~~ <sup>stalk</sup> like thick structure that acts as support to the fruiting body. It consists of interwoven hyphae in it and it runs almost vertically above the ground.

b) PILEUS :- Pileus is a concave/umbrella shaped structure that is about 10-12 cm in diameter when fully mature. This is the fruiting body of Agaricus.

\* It contains numerous segment like structures (lamella) on its lower surface called Gills.

\* Annulus ring is a structure that connects/separates the stipe to pileus.

c) GILLS :- These are spore bearing segment like structure below the surface of Pileus.

These are about 300-600 in number.

Gills contain interwoven hypha divided into three regions

- 1) Trama.
- 2) Sub Hymenium.
- 3) Hymenium.



B c) \* Fungi plays a major role in the field of biotechnology. They are used in the production of various insecticide, herbicides, fertilizer, used as bio-control agents.

\* Mycotechnology is a field in which the fungi are used for the treatment of plants or stimulate healthy growth among them. Here the fungi are also used in several fields like:-

a) Production of enzymes:- Many fungi like Saccharomyces, etc are used in preparation of enzymes like zymase, invertase, peptidases etc.

b) Production of antibiotics:- Some antibiotics that are used in the treatment of plants are produced from fungi like Aspergillus, Penicillium etc.

c) Production of steroids and alkaloids:- Fungi can produce substances that are used as steroids and alkaloids that helps the plants to have strong immune to diseases. These are also used as medicinal supplements for hum

d) Production of biofertilizers:- The biofertilizers produced by fungi are more effective for plant growth as they are natural, immuno-genic and non-artificial.

e) Production of chemicals for sanitization of plant seeds and agricultural equipments to resist further diseases



### PART - III

5. a) The breakdown of a single cell by the formation of a constriction (transverse wall) to form two daughter cells is called Binary fission.

During fission, the cytoplasm and nucleus divides and is transferred into the daughter cells.

5. b) Micro-organisms like many bacteria, fungi and other microbes are used in the preparation of fertilizers, pesticides.

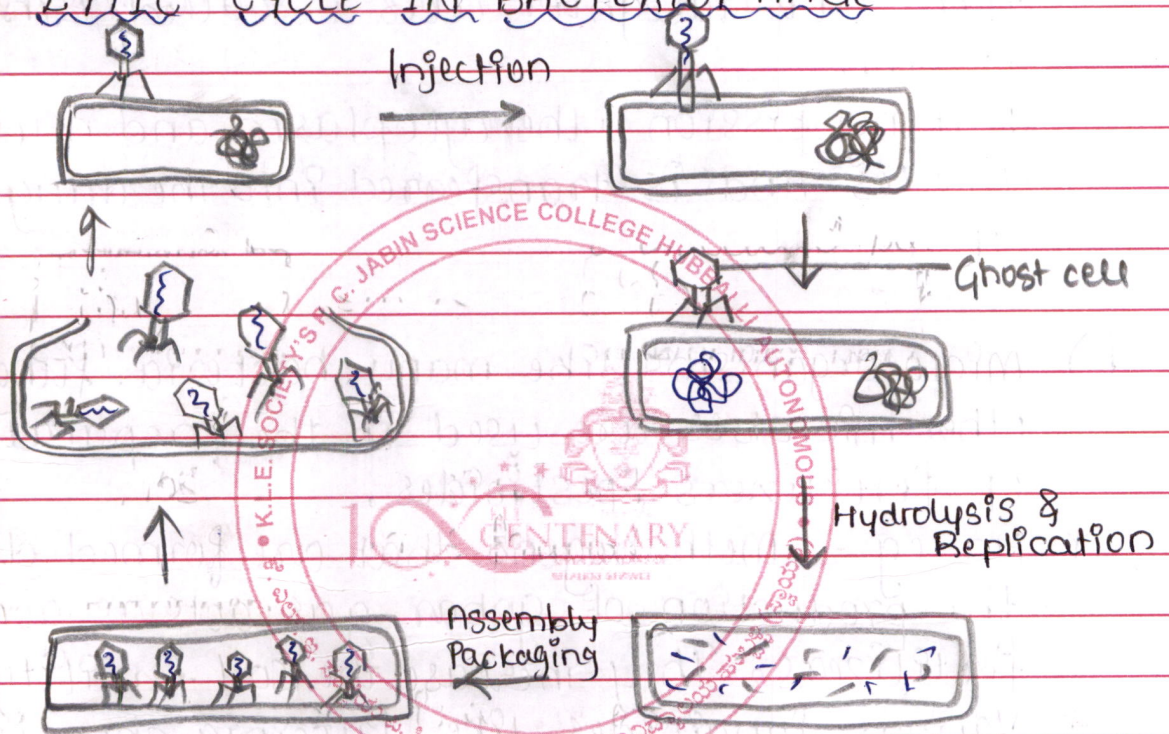
\* For eg - Methanogens that are formed during the production of gobar gas acts as good fertilizers. They increase the soil fertility.

\* Various fungicides like Puccinia chondrilla, Beauveria bassiana, Dytella etc are used for the eradication of weeds, insecticides, herbicides & nematocides. They help in disease control among agricultural crops.

\* Microbes like nitrobacterium, help in Nitrogen fixation. Other microbes present in the soil help in healthy plant growth.



### 5C) LYTIC CYCLE IN BACTERIOPHAGE



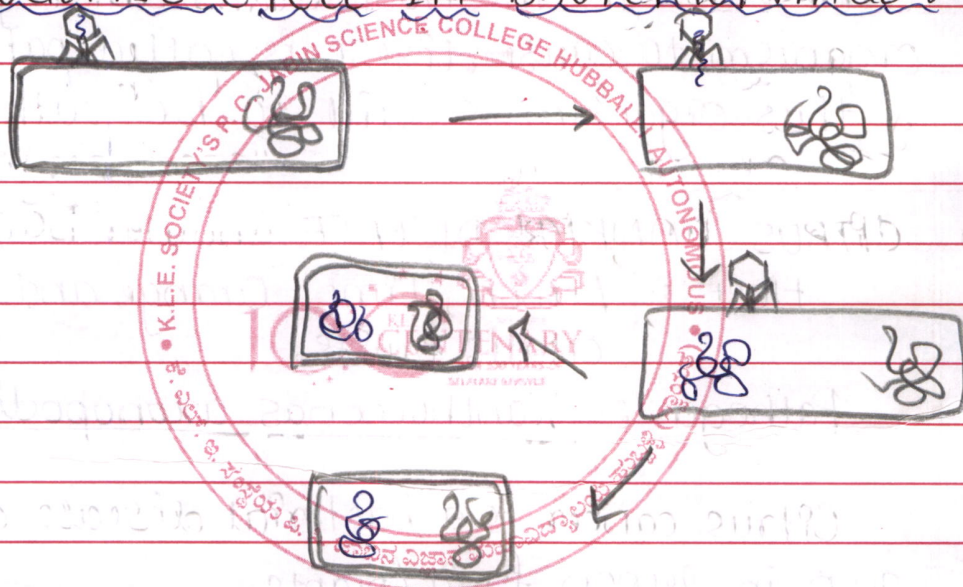
LYTIC CYCLE in bacteriophage involves following steps.

- ① Adhesion of a bacteriophage containing viral DNA to the host bacterial cell.
- ② Injection of viral DNA into the host bacterial cell. The OMPC [O-antigen Polysaccharide Lipid-C] helps in the binding of bacteriophage to host.
- ③ The viral DNA/plasmid in the host governs hydrolysis of bacterial DNA into small fragments.
- ④ Replication of viral DNA within the host cell.



- ⑤ Assembly & Packaging of viral DNA. A prismoid bacteriophage head develops around viral DNA and phage is formed.
- ⑥ Phages release lytic enzymes that burst open host cell and they are released. After this process the host cell dies.

LYSOGENIC CYCLE IN BACTERIOPHAGE :-



LYSOGENIC CYCLE in bacteriophage is non virulent. The viral DNA remains temperate. The prophage formation takes place during lysogenic cycle. For some period of time they remain in a resting stage. Soon after it finishes rest, lytic cycle can be observed again. Eg - Lambda phages.



## PART - IV

8. a) Pathogenicity is the ability of an organism to affect another (host) organism leading to occurrence of adverse effects (Symptoms) on the host.

An organism is said to be pathogen if it can cause a disease in the host. This ability of organism to cause disease is called pathogenicity & thus organism is said to be pathogen.

8. b) CITRUS CANCKER DISEASE

Host :- Lemon, Lime, Orange and other citrus fruits.

Pathogen :- Xanthomonas axonopodis

Citrus canker is a bacterial disease commonly seen in lemon fruit/plants.

Symptoms :-

- \* water soaked oily lesions can be observed on the fruit, leaves and stems.
- \* In severe conditions, these lesions show a raised, corky appearance.
- \* These spots are surrounded by a yellow region - 'halo'
- \* The spots increasing when the infection is severe.
- \* Canker affected fruits fall prematurely



\* Canker infected fruits are safe for humans to eat, but they have reduced marketability.

80c) Asexual reproduction in bacteria can occur in two ways.

- i) Binary fission.
- ii) Endospore.

(Favourable conditions)  
(Unfavourable conditions)

i) Binary Fission.

\* It is the breakdown of a single bacterial mother cell leading to the formation of two daughter cells.

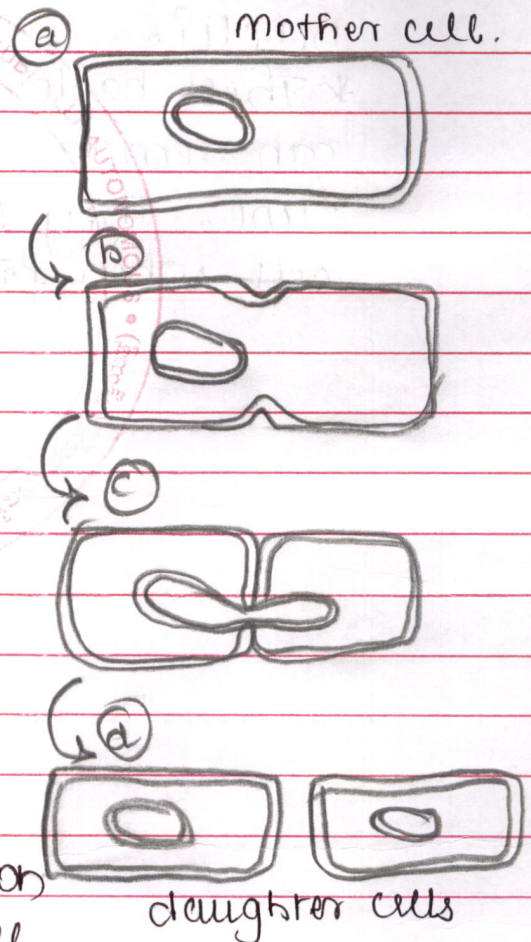
\* During binary fission, a constriction can be observed.

\* This constriction grows from the periphery to the centre of the cell.

\* Meanwhile, the cytoplasm is transferred into both the sides of the constriction and the nucleus of the cell start dividing into two.

\* When the constriction has reached the center of cell, the bacteria divides into two having a nucleus each. These are called daughter cells.

\* Binary fission takes place in favourable conditions



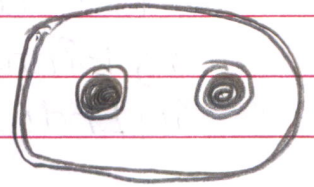
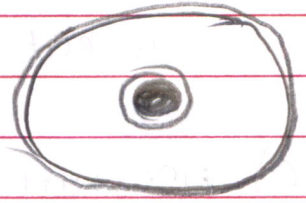


(ii) Endospore formation.

\* Formation of endospore in bacteria takes place only in unfavourable conditions.

\* The nucleus in the mother cell undergoes division to form two haploid daughter nuclei.

\* These haploid nuclei act as endospores. These can remain viable for a longer period of time. They later form another bacterial cell when favourable conditions occur.





UNIT - II

(Extra).

4. a) Ectomycorrhiza are the ones that create a mantle around the roots and grow within intercellular spaces without penetrating into the root cortical cells and help in the absorption of nutrients from the soil to the plants.

4. b) ROLE OF FUNGI IN FOOD INDUSTRIES:-

Fungi play a vital role in the production of many food items.

\* Saccharomyces cerevisiae is a fungi that help in the production of cheese.

It is also called as baker's yeast as it is used in fermentation of bread, cakes, cookies and other bakery products.

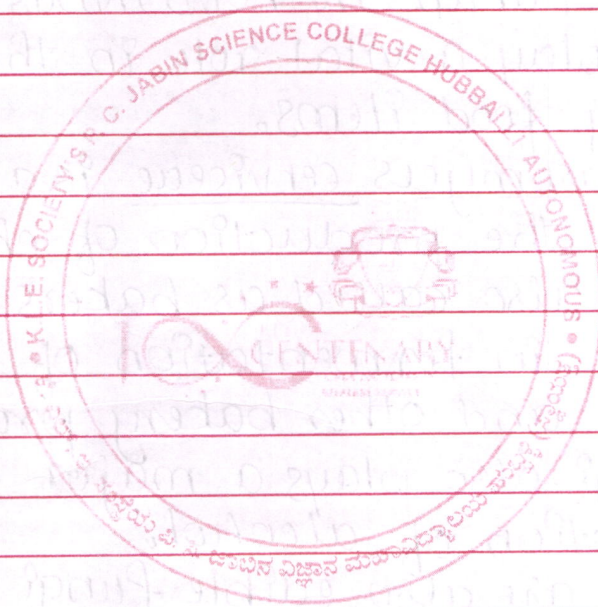
Fungi also plays a major role in the production of alcohol.

\* There are also edible fungi that are safe for humans to consume directly.

Eg - Agaricus bisporus (white button mushrooms), Oyster mushrooms, Shi-take mushrooms are nowadays very popular and are highly consumed.



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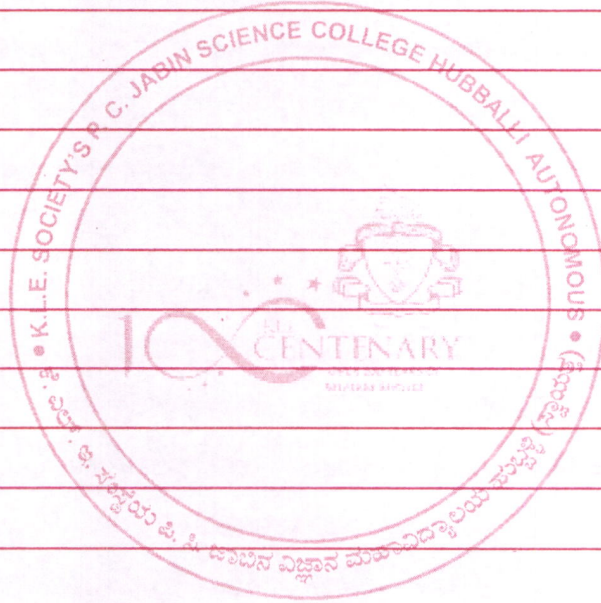


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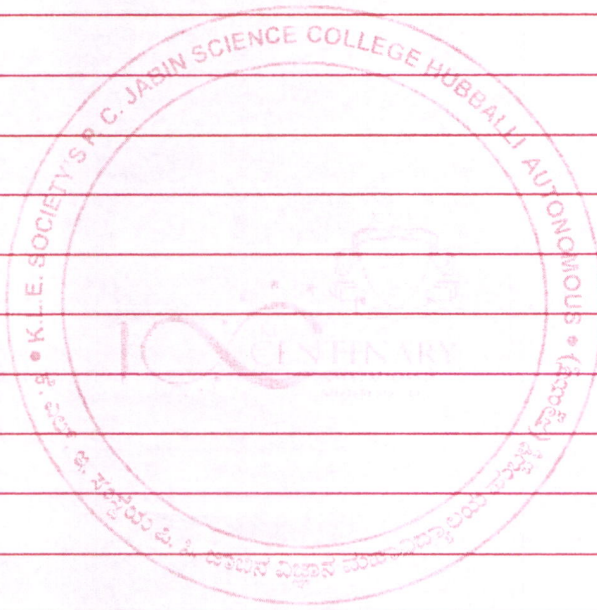


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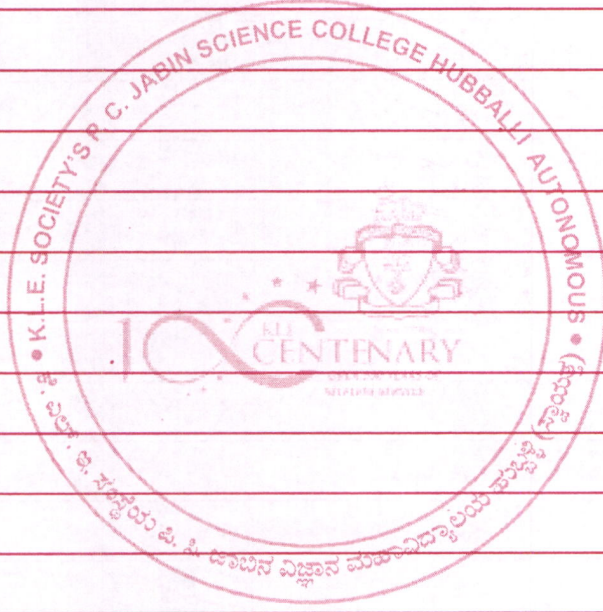


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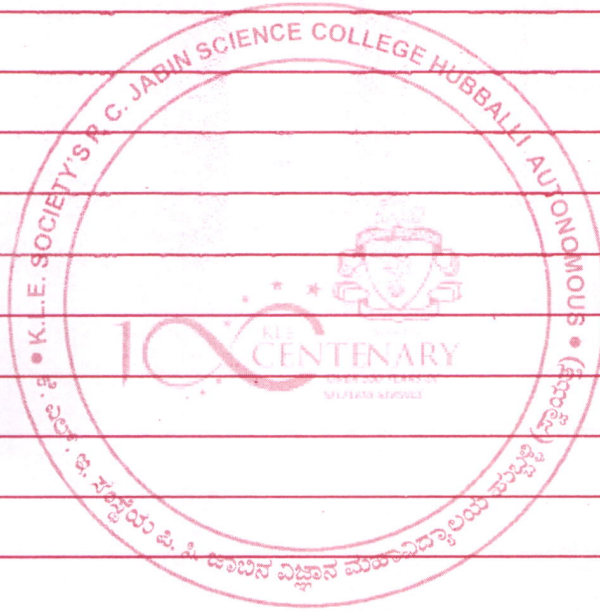


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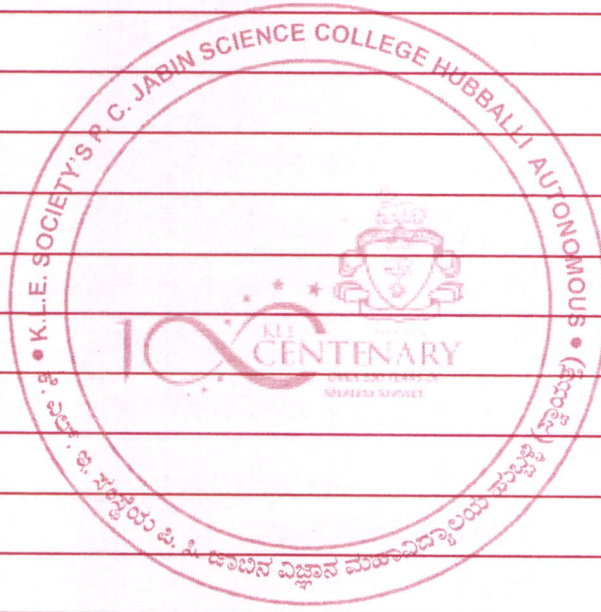


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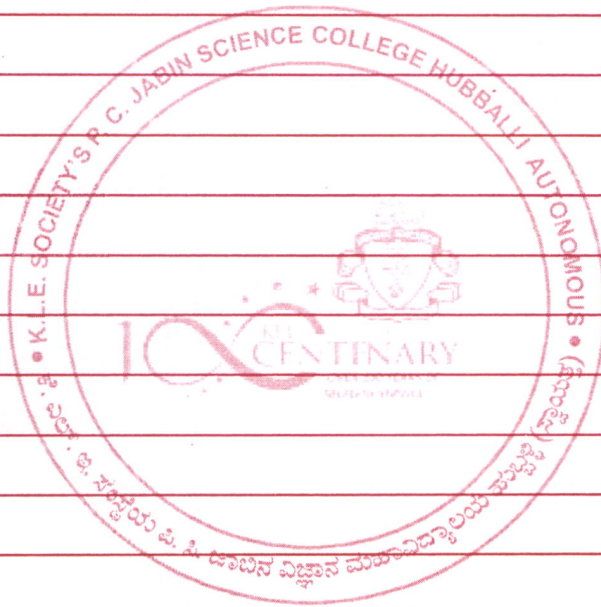


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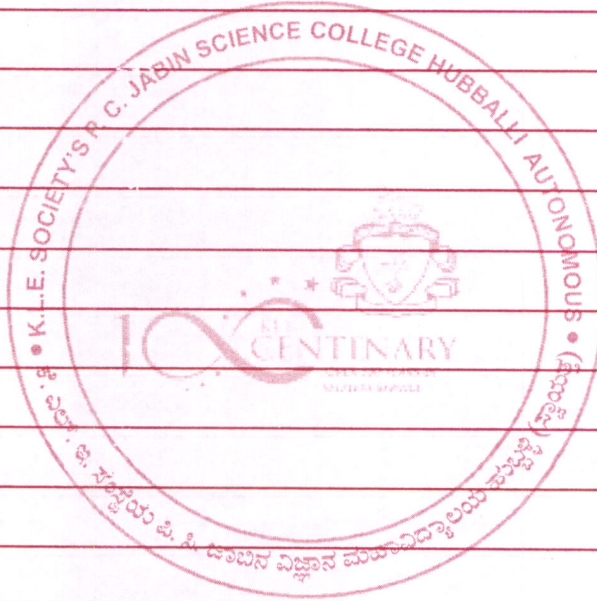


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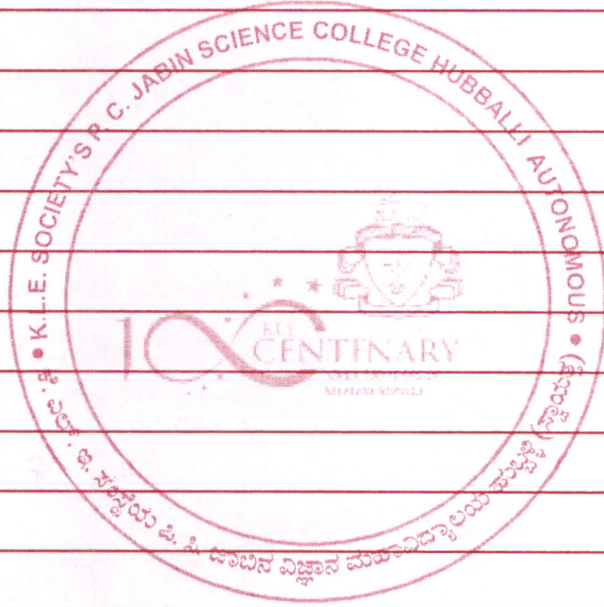


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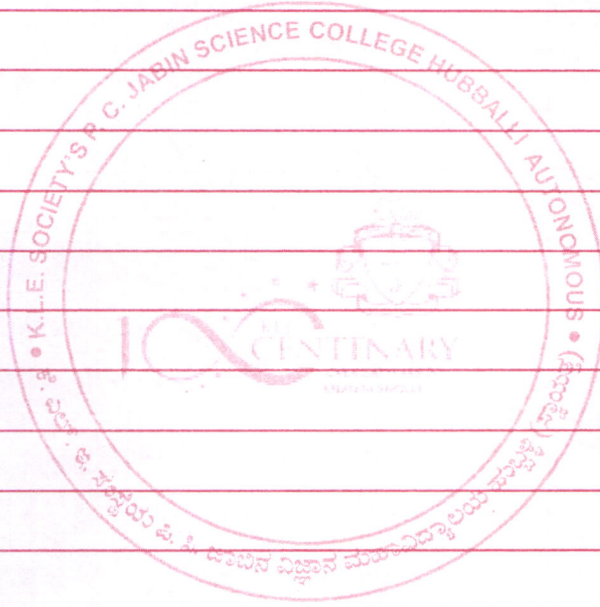




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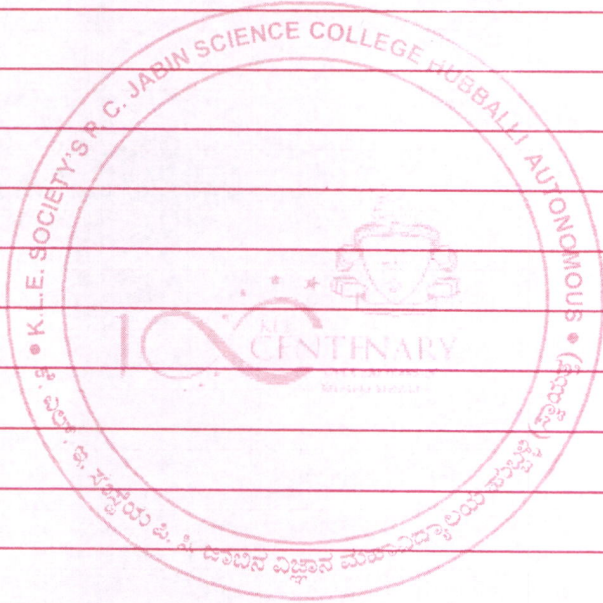


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