Chhatrapati Shahu Ji Maharaj University, Kanpur

Answer Script Details
Barcode 6428319

Roll No. 24062000472
Total Mark 57/75.00

Exam MASTER OF SCIENCE _ODD EXAM-DEC-24
Subject B040701T - DIVERSITY OF MICROBES AND FUNGI

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	4/5	8B	NA/5				
1B	4/5	8C	NA/5				
1C	4/5	9	NA/15				
1D	4/5						
1E	4/5						
1F	4/5						
1G	4/5						
1H	4/5						
1I	4/5						
2	11/15						
3	NA/15						
4A	NA/7						
4B	NA/7						
5	NA/15						
6	10/15						
7	NA/15						
8A	NA/5						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

Date of Exam: 2-01-2025 Shift: I Room No.: 25
Paper Code: B040701T Subject: Diversity of microbes and fungi Year/Sem: I
Name of Candidate: NANCY RATHI
Roll No.: 2 4 0 6 2 0 0 0 4 7 2

Signature of Candidate | Signature of Invigilator | COE Facsimile

PART-II

MARKS OBTAINED

Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										

Total Marks in Figures | Max. Marks
Total Marks in Words

B 0 4 0 7 0 1 T
Paper Code

Signature of Evaluator

Course: Master of Science (Botany)
Session: 2024 Year/Semester: I
Subject Name: Diversity of Microbes & fungi
Medium: English ● Hindi ○

महाविद्यालय का कोड College Code: K N 0 4

परीक्षा केन्द्र का कोड Exam Centre Code: K N 0 4

परीक्षा का प्रकार Type of Exam
संस्थागत Regular ● भूतपूर्व छात्र Ex. Student ○
व्यक्तिगत Private ○ बैक पेपर परीक्षा Back Paper Exam ○

Paper Code: B 0 4 0 7 0 1 T

Exam Date: 2 0 1 2 0 2 5

Name of Candidate: NANCY RATHI

Father's Name: AJAY PRASAD RATHI

ANSWER BOOKLET NO.
6428319

B 0 4 0 7 0 1 T
Paper Code

नामांकन संख्या Enrollment Number: C S J M A 2 4 0 0 0 1 3 1 6 5 8

परीक्षार्थी अनुक्रमांक संख्या Candidate's Roll Number: 2 4 0 6 2 0 0 0 4 7 2

प्रश्न पत्र कोड Paper Code: B 0 4 0 7 0 1 T

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नोट : 1. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पत्र के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. बॉक्स में भरी जाने वाली प्रविष्टियाँ बायीं तरफ से शुरू की जायें। 3. गोलों को काले या नीले बॉलपेन से भरा जायें।

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below, blacken thecircles completely.

4. Make no Stray marks o n this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

IN ORDER TO AVOD UFM (UNFAiR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/electronic/digital/ watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

अनुचित साधन से बचने हेतु :

1. उत्तर पुस्तिका के निर्दिष्ट स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखे तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के मुखपृष्ठ अथवा उत्तर पुस्तिका संख्या पर छेड़ छाड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में किसी प्रकार साथ न लायें, जैसे लिखे हुए कागज के टुकड़ें, मोबाईल, डिजिटल डायरी, डिजिटल वॉच, कैमरे, पुस्तक एवं सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संक्रमित प्रश्नपत्र में ही मेमोरी लेस साइंटिफिक कैलकुलेटर ले जाने की अनुमति होगी।
4. उत्तर पुस्तिकाओं में लगाये न स्वयं न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थियों को विशेष निर्देश

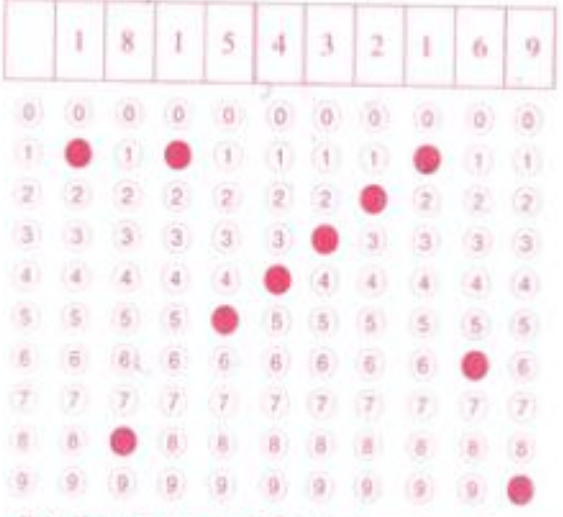
1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. अपना पृष्ठ को दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर रोमन तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र ID सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ (1-24) से कम है या फटे हुए है, शुरू होने के पूर्व दूसरी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके होने के 30 मिनट के अन्दर कक्ष निरीक्षक को सत्यापित सूचित करें, उसके बाद विश्वविद्यालय द्वारा नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. बी कोपी या अतिरिक्त शीट नहीं दिया जायेगा।

INSTRUCTION TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-24) or any other kind of damage in your answer script, if found than change the answer script immediately before t commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Name, and Question of the Question Paper during first THIRTY MINUTES commencement of the exam, so that it can be corrected in TIME. After that corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in as Carry Over. Those appearing as Ex- Students should fill in status as ex
10. No supplementary answer book & graph paper will be provided.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.



Note- If your Roll No. is of 10 digits. Please leave first three columns .

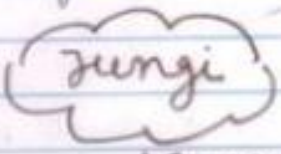
Paper Code

1

Section → C

Economic importance of fungi

fungi are achlorophyllous micro organisms which are useful in many ways and play important role in our lives.



ECONOMIC IMPORTANCE

USEFUL / BENEFICIAL ASPECTS

1. As food
2. In medicine
3. In industry
4. In formation of Enzymes
5. In agriculture
6. formation of organic acids
7. In research

HARMFUL ASPECTS

1. Causes disease in humans
2. Causes disease in plants
3. Caused disease in animals
4. Destruction of timber
5. Spoilage of food
6. destruction of articles

Paper Code

Useful aspects of fungi

(1-) As food

fungi is used as food in all world.
Agaricus is used as food in all parts of world.
Morchella esculenta is used as food in certain parts of India

Yeast → is also very nutritive and used as food.
fungi contain 21-23% protein and certain vitamins also.

(2.) In Medicine

fungi is used in Medicine. the first

1) Antibiotic

the first Antibiotic was Penicillin which was extracted from Penicillin notatum fungi which is the member of the Ascomycetes.
Antibiotics are the substances which reduce the growth of other harmful microorganisms.

ii.) Ergot

Ergot → Ergotine

useful in the treatment of ~~[illegible]~~ hemorrhage

iii.) Vitamins

Yeast → rich in vit B12 complex

3. In industry

i.) Brewery industry

fungi is used to prepare → wine and beer.

wine is prepared by → Aspergillus oryzae

beer is prepared by → Saccharomyces cerevisiae

ii.) fermentation

used for the process of fermentation.

used to ferment. [illegible]

iii.) cheese

fungi is used for the preparation of cheese.

Bacteria is for preparation in early stages and fungi is used for the preparation in later stage.

~~Penicillium~~ Penicillium roqueforti and Penicillium camemberii is used for the the preparation of cheese.

(4.) **In formation of enzymes**

Certain fungi such as **Saccharomyces cerevisiae** is used in the formation of enzyme **invertase** which converts Glucose into fructose

(5.) **In the formation of organic acids**

Citric acid → It is made by the fungi **Aspergillus niger**. Citric acid is also used in the soft drinks.

(6.) **In agriculture**

i.) **As scavanture**

It helps in decomposition of dead and decaying matter.

ii.) **Mycorhizza**

found in the symbiotic relationship also with roots of higher plants called helps fungi helps them for the nutrient uptake.

iii.) Humus formation is also elaborated by the fungi.

(7.) **In Research**

In **Neurospora** used as in the research Neurospora is used as a test organism in for vit B complex.

Paper Code

5

Harmful aspects of fungi

1. Causes disease in Humans & Animals.
fungi causes Ringworm.

2. Causes disease in plants
fungi causes many fatal disease in plants
Eg:- for example:-
Red Rot disease is caused by → Colletotrichum falcatum
Loose Black rust of wheat caused by Puccinia graminis
Late blight Early blight of Potato
↳ Alternaria solani

3. Destruction of timber
certain fungi destroys the wood of economically important plants.

4. Spoilage of food
Rhizopus & Mucor → spoils the bread, Bible etc

5. destruction of leather and Articles
Certain fungi destroys leather material by creating patches in it. these fungi also destroy articles.

Paper Code

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Section → B

Q2.

Ans2.
- Bacteriophage is the virus that infects Bacteria.
- Bacteriophages are the Bacteria eating viruses.
- Bacteriophages are neither living nor nonliving - they come in between them.
- Bacteriophage requires living organism for their metabolic activity without that they can not synthetise their protein or Replicate their nucleic material.
- bacteriophage can have either DNA or RNA but never Both.
- Bacteriophages can be stored as crystal

There are 2 types of Bacteriophag

1. T even phage
2. T odd phage

(1.) T-even phage
It consists of Angular head and long contractile tail.

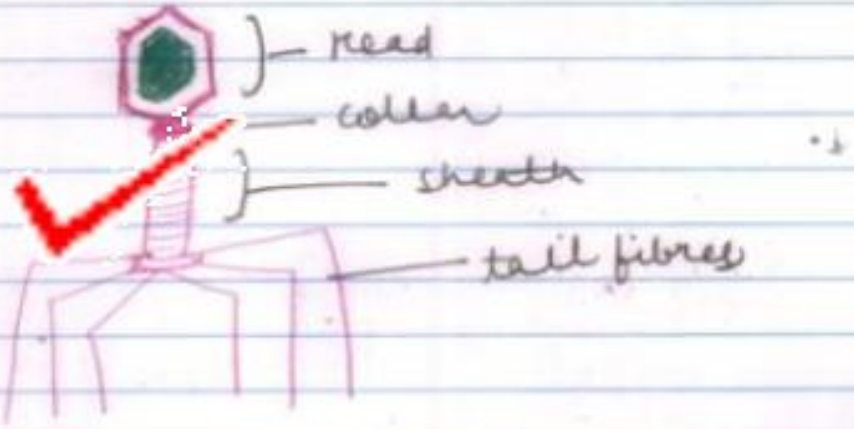
Paper Code

7

(2) T- odd phage

It consists of → Angular head
↳ short contractile tail.

• Structure of T- even phage of $



(1) Head → consists of Nucleic acid material in centre at the core.

(2) Collar → collar joins head with sheath.

(3) Sheath & tail fibres → sheath consists of protein from which tail fibres come there are total six tail fibres.

Note ⇒ Its head is the proteinacious sheath whose unit is capsomere.

P.T.O

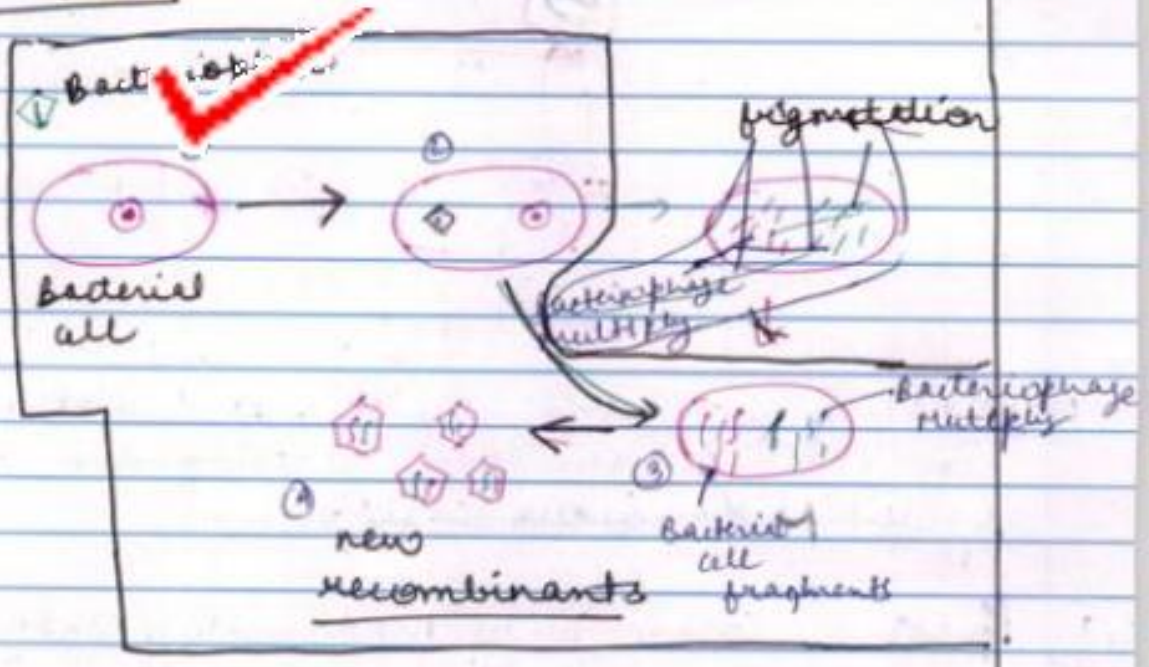
Paper Code

Bacteriophage causes infection by the two possible ways in the Bacteria:-

Lytic Cycle

Lysogenic Cycle

(L) **Lytic cycle**



- Bacteriophage comes near Bacterial cell.
- Bacteriophage Breaks Bacterial Nuclear material into fragments.
- Bacteriophage → multiplies.
- Bacteriophage breaks/makes fragments of Bacterial nuclear materials.
- Now new recombinants are formed.

Paper Code

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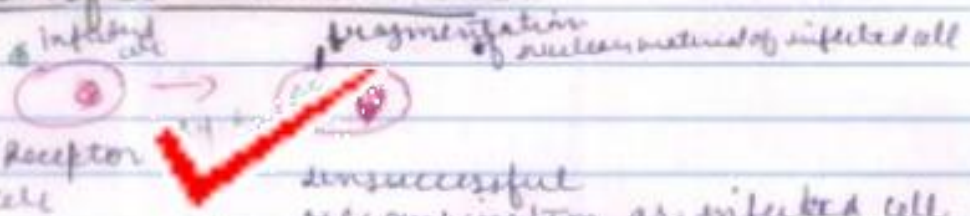
from here when this new infected bacterial cell goes to new receptor bacterial cell to infect there are three possible ways :-

i.) **Successful recombination**

Successfully combine with receptor bacterial cell.

ii.) **Unsuccessful recombination**



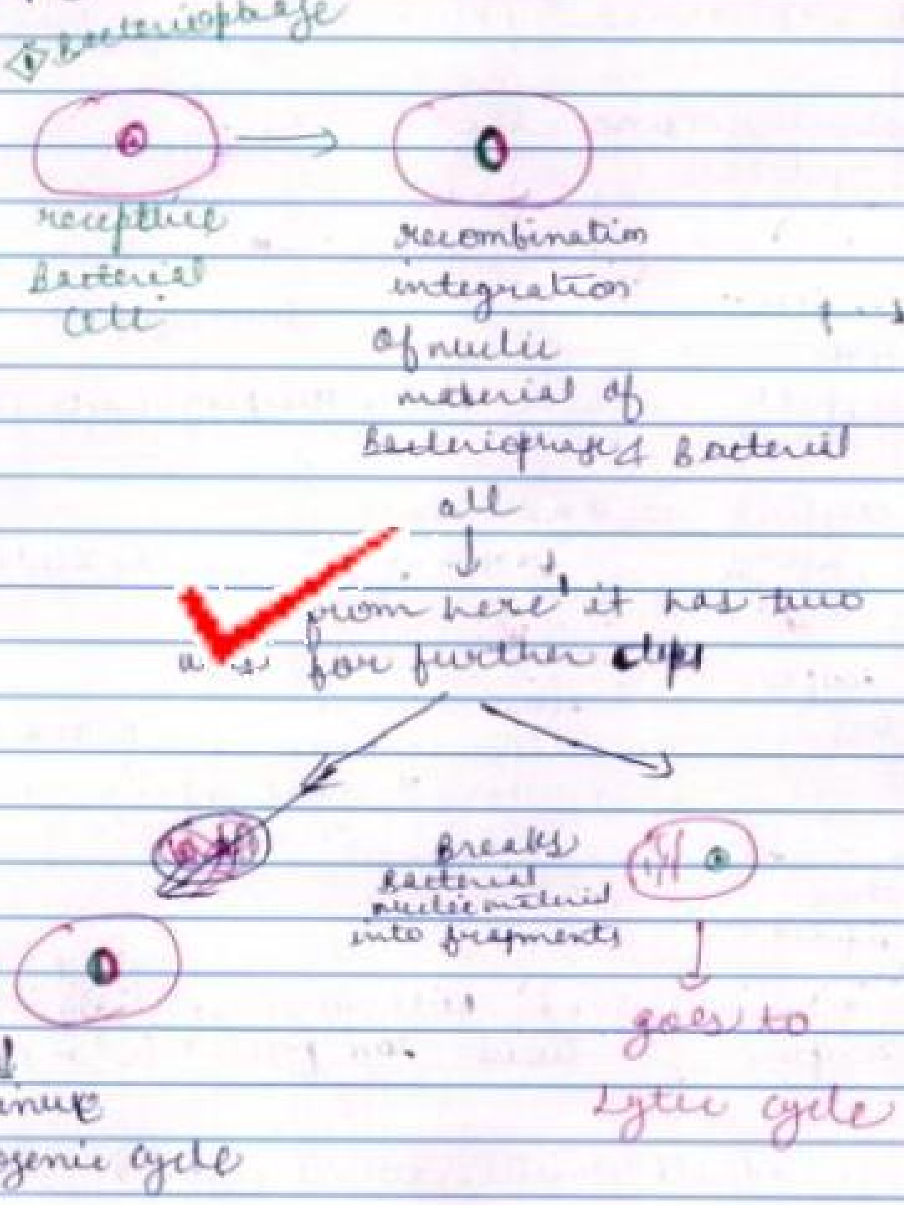
iii.) **Abortive**

If infected cell Nucleic material penetrates the receptor cell but without recombining is present there.

(2) Lysogenic cycle

Lysogenic cycle is the other alternative

method, as by which Bacteriophage can multiply in Bacterial cell.



↳ ~~Bacteriophage infects receptive Bacterial cell~~

↳ there is recom

Paper Code

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b) Bacteriophage infects receptive Bacterial cell. they both recombine integrate ~~Rods~~ from here it can have two fate either Bacteriophage phage breaks Bacterial Nucleic acid into fragments. and then it goes to Lytic cycle and Lytic cycle continues. or

it can form more recombinants and lysogenic cycle continues.

Section → A

Q 2.

a) debary → for the first time described and told about sex hormones in fungi.

In fungi sex hormones are divided into three types :-

Erogen, Erotropin, Erotation

1) Erogen

this hormone helps in the formation

of sex structures in fungi.

ii.) Exotropii

this helps in the sex structure formation and also acts as catalyst which boosts the sex structure formation.

iii.) Exotaition

this hormone secretes or go to attract opposite structure and also stimulates production of
Exotaition it also has following types:-

a.) Serotonin

It is secreted by + gamete for attracting male gamete

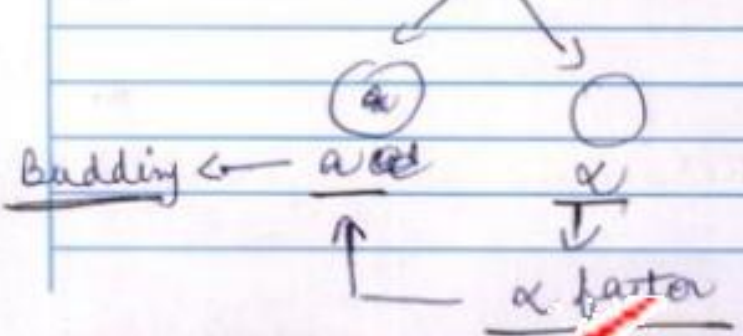
It is oxygenated and made of 15 Carbon.

b.) Androgonial / oogonia

It is secre

b.) yeast α factor

yeast have two types of cells



~~yea defe a~~ ~~@ fader~~
a → is responsible for budding but it does or secretes hormone for budding only if
α → releases → α factor which stimulates a which then performs and initiates budding.

(B.)

Satellite virus

~~Stab~~ Satellite virus are used in Biotechnology they are ~~large~~ form many copies.
so they are very helpful in Biotechnology.

Paper Code

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c) Mycoplasma

- Now comes under Bacteria.
- Also called as PPLO
  - Pleuro Pneumonia like organisms.
- Mycoplasma lacks cell wall. As it lacks cell wall it does not have any particular shape. its shape changes and it can be of any shape therefore because of this it is called joker of the Plant Kingdom.

Shapes of Mycoplasma

- As Mycoplasma lacks cell wall it has 2-3 thicks layers and in centre there is Nucleic acid.

Structure of Mycoplasma

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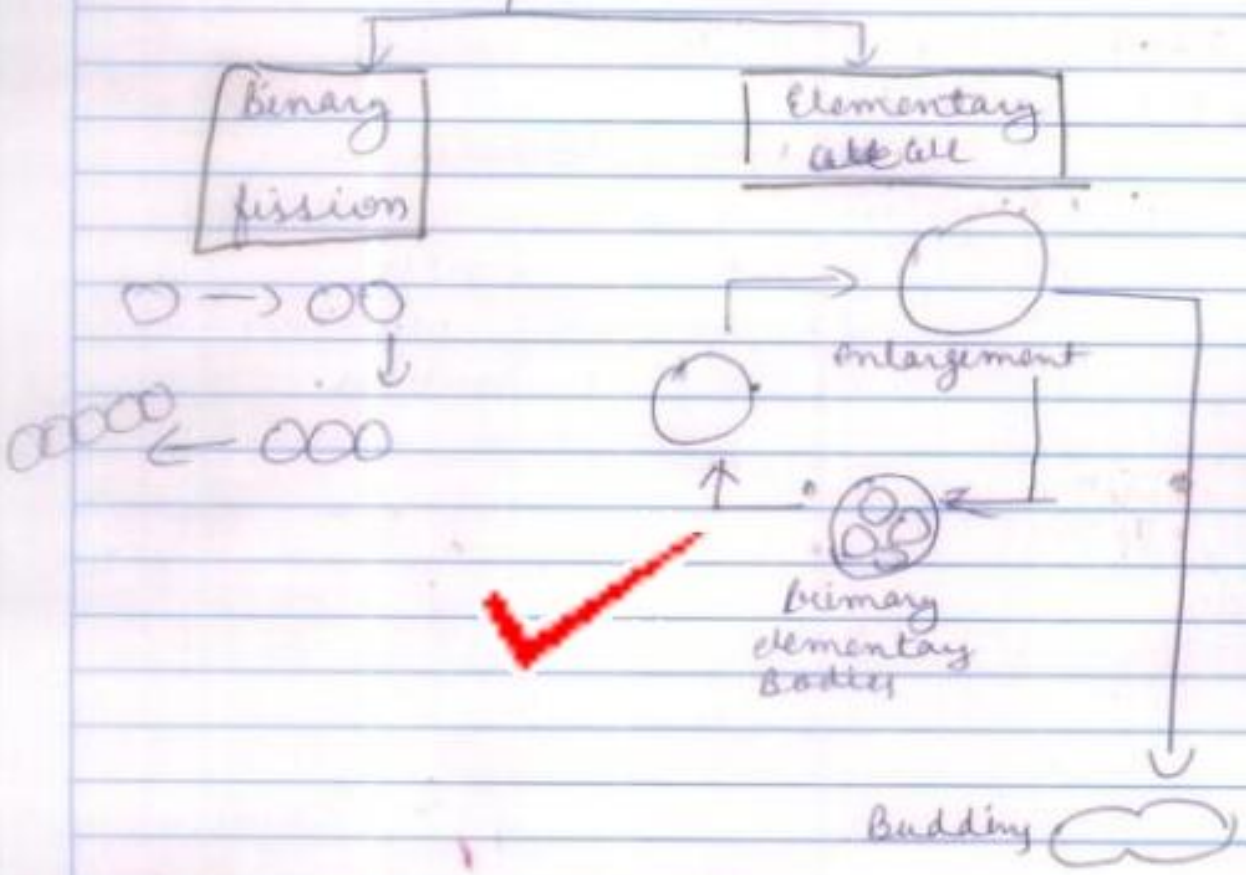
15

b) Mycoplasma shows reproduction by 2 ways



c) Mycoplasma is causes disease in plants & Animals.

b) In Plants it causes → Little leaf of Brinjal, Bunchy top papaya

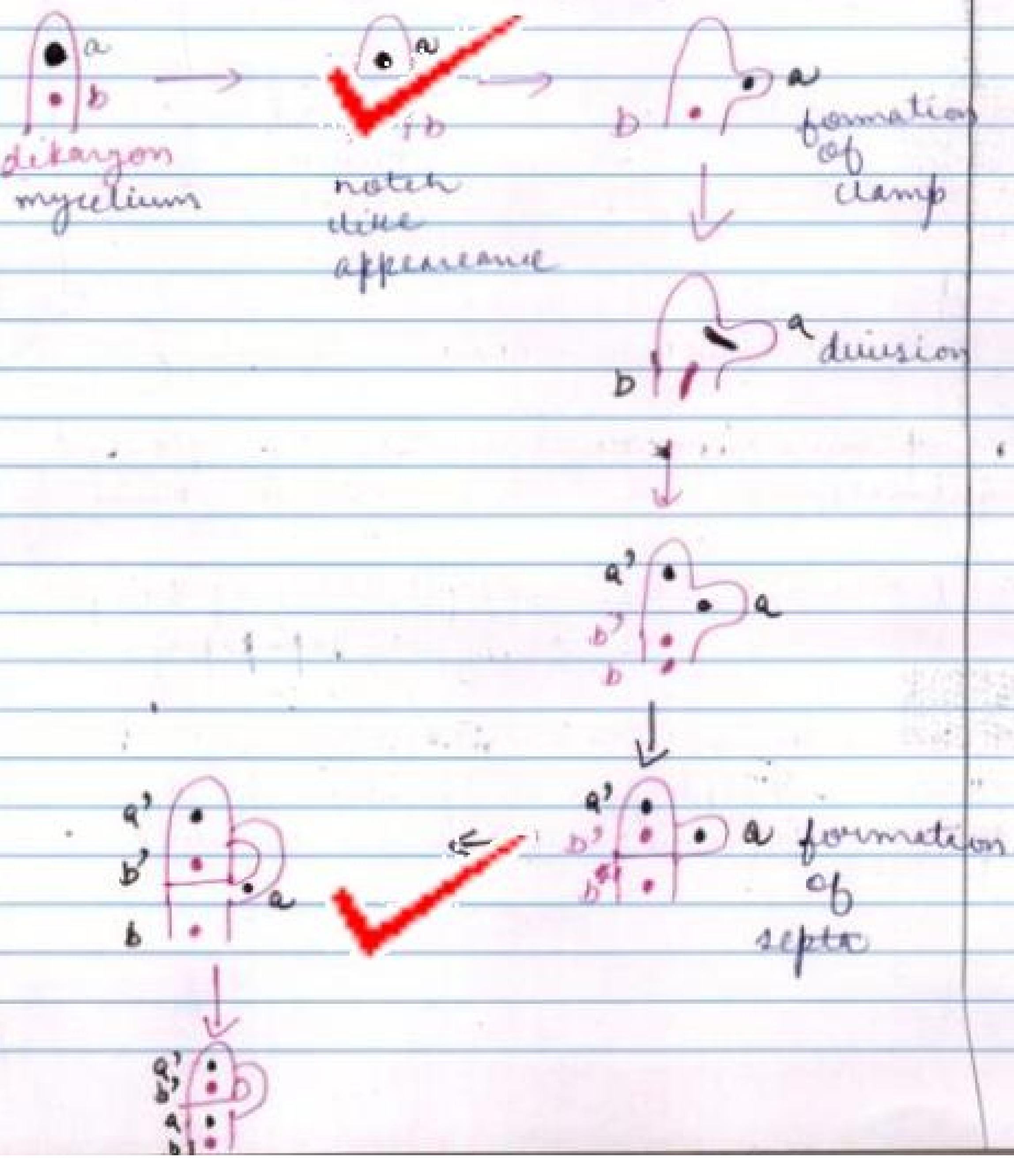
b) It cause can be transmated through mechanical means, leafhopper, Aphids, &, By touching infected leafes with healthy ones.

d.) **Clamp connections**

↳ clamp connections is the feature of basidiomycetes.

↳ there are three types of mycelia in basidiomycetes

↳ (1) Primary mycelium
(2) Secondary mycelium
(3) tertiary mycelium.



In dikaryotic mycelium there are two nuclei a & b.
there is notch like appearance. Under clamp a nuclei goes into clamp.
there is division of both nuclei one division of b is normal and division of a is oblique. b divides into b' and a divides a'.
a' moves to main cell and b' is also in the moves to upper in cell.
b in the terminal part of the cell.
there is formation of septa a' & b' in one cell. and one septa is at clamp there is a' nuclei.
now there is formation of bridge like structure.
a' nuclei moves towards the terminal cell b through that.
Now a', b' nuclei are in one cell & a, b. nuclei are in one cell.
So, this is the formation of clamp connection.

clamp connection is the characteristic feature of basidiomycetes as it lacks proper sexual structure.

P.t.o.

E)

Antibiotics are certain chemical substances which are released by microorganisms which are resistant or are dangerous for the growth of other microorganisms.

First Antibiotic was made by fungi which is known as

↓

Penicillium

↓

It was extracted from the

↓

Penicillium notatum

Penicillium was extracted by fungi Penicillium notatum by Alexander fleming.
Penicillium notatum is the member of Ascomicotina fungi.

Antibiotics are also extracted from other microorganisms
eg:-
Streptomyces → extracted from
Streptomyces griseus.

↓

which is Bacteria

Paper Code

19

Streptomyces is the first antibiotic extracted from → Bacteria.

b) Soridium

Soridium are the greyish white outgrowths present in the lichen it helps to perform → sexual reproduction in ↓ Lichen

~~As sexual reproduction is observed in Lichen therefore~~

Sexual reproduction is performed only by the fungal component of the lichen. But Soridium is the asexual type of reproduction present in lichen which is done by the contribution of both the algal and fungal components. Lichen is the symbiotic relationship formed by the symbiotic relationship b/w algal and fungal (components) where algal component is called phycobiont and fungal component is called mycobiont.

(9.) Myxomycetes is the member of Mycota. Under Mycota come those living organisms which are achlorophyllous & the cell wall is not present. Normally cell wall is present like plants but they are not plants as they do not show photosynthesis as chlorophyll is absent.
they are obligate heterotrophic (their mode of nutrition is either parasitic or saprophytic).
they do not make their own food.
Plasmo

Normally cellwall is present in the other fungi but in Myxomycetes cell wall is absent. But still it is under Mycota because it is Achlorophyllous does not show photosynthesis mode of Nutrition is → heterotrophic

parasitic Saprophytic

b) Plasmodium is present as vegetative body which is multinucleated.

Paper Code

21

(11.) Conjugation of Bacteria is done By which there is exchange of genetic material in the bacteria.

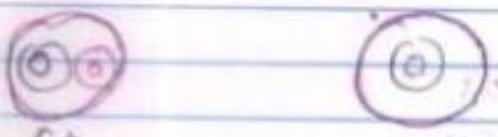
there are three types of factors:

F^+ Hfr F^-

conjugation is performed by these factors

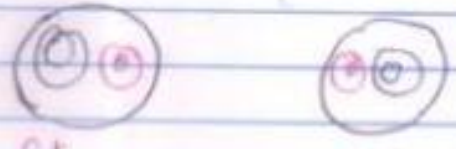
i.) F^+ — F^-

donar recepient



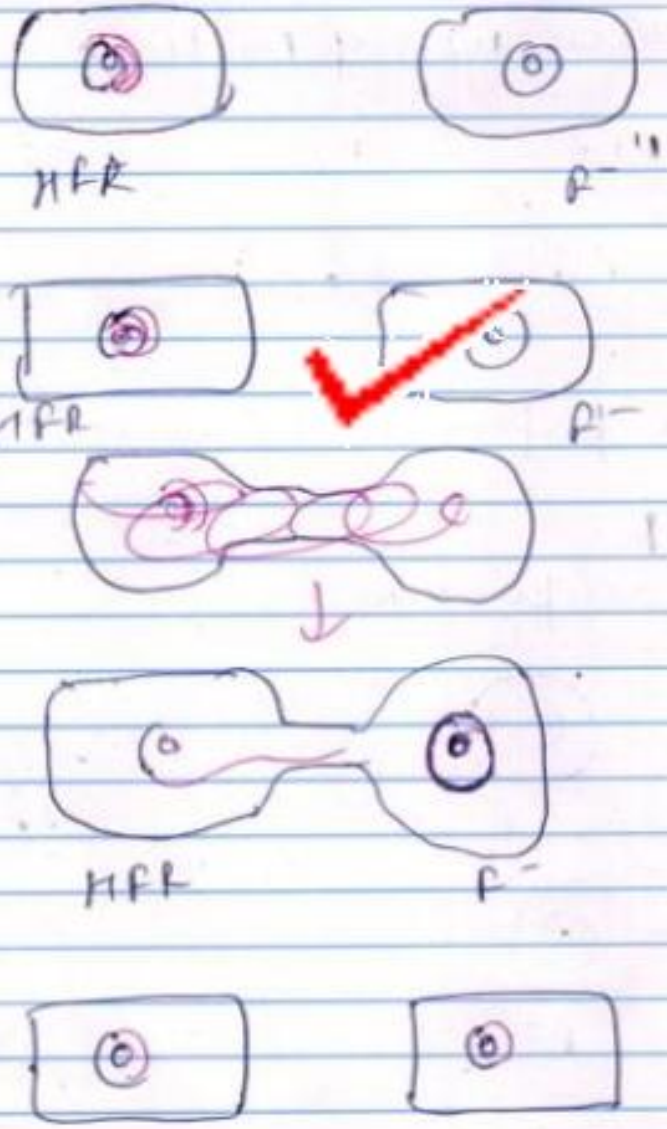
F^+ F^-

F^+ F^-



F^+ F^-

ii.) HFr (High frequency recombinant) : d F⁻ receptor
donar



Paper Code

23

(I.) Transmission of plant virus

Plant virus can be transmitted by following ways:-

1.) Seed

Certain diseases are also transmitted by seeds.

ii.) By Mechanical means

using same knife for the two different plant one is diseased and one is healthy.
touching diseased plant after that healthy plant.
vegetative propagation

iii.) By soil

iii) By insects

iv) By nematode

v.) By Fungi

Paper Code

24

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