Chhatrapati Shahu Ji Maharaj
University, Kanpur

Answer Script Details
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Exam MASTER OF SCIENCE _ODD EXAM-DEC-24
Subject B050701T - NON CHORDATA

Question wise Mark Summary

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

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-II

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
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Total										
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Total Marks in Words										

B050701T
Paper Code

Signature of Evaluator

Date of Exam: 22/01/2025 Shift: 1st Room No.: 12
Paper Code: B050701T Subject: Zoology Year/Sem: 1st Sem
Name of Candidate: ALSHIFA ALAM
Roll No.: 2408002203O

Signature of Candidate
Signature of Invigilator
OE Facsimile

Course: M.Sc Zoology (Previous) 1st
Session: 2024-25 Year/ Semester
Subject Name: Zoology
Medium: English ● Hindi ○

Paper Code: B050701T

Exam Date: 22012025

Name of Candidate: ALSHIFA ALAM

Father's Name: MOHD ALAM

College Code: KN04

Exam Centre Code: KN04

Type of Exam: Regular ● Ex-Student ○ Private ○ Back Paper Exam ○

ANSWER BOOKLET NO.: 6428380

B050701T
Paper Code

Enrollment Number: CSJMA240000013789

Candidate's Roll Number: 2408002203O

Paper Code: B050701T

Alshifa Alam
Signature of Candidate

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

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-I

परीक्षार्थियों को दिया निर्देश

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.

1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. अपना पूरा से दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों 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 कटे हुए है, तो पर
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 परीक्षा
होने के 30 मिनट के अन्दर कक्ष निरीक्षक को सत्यापन सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई
नहीं की जावेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. दी कोपी या अतिरिक्त ग्राफ नहीं दिया जावेगा।

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 the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Su Name, and Question of the Question Paper during first THIRTY MINUTES of t commencement of the exam, so that it can be corrected in TIME. After that no 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 stat 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-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.**

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.

	1	8	1	5	4	3	2	1	6	9
0	0	0	0	0	0	0	0	0	0	0
1	●	1	●	1	1	1	1	●	1	1
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3	3	3	3	3	3	●	3	3	3	3
4	4	4	4	4	●	4	4	4	4	4
5	5	5	5	●	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	●	6
7	7	7	7	7	7	7	7	7	7	7
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9	9	9	9	9	9	9	9	9	9	●

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

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 tampering 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 निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखें 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 निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़ें, मोबाईल, डिजिटल डायरी, डिजिटल वॉच, कैमरा, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। चेकिंग संबंधित प्रश्नपत्र में ही मोबाईल तथा इलेक्ट्रानिक कैलकुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में करेंसी न रखें न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

Paper Code
B050701T

1

(SECTION - A)

Short Answer Type Questions

Ans. 1 (a)

Osmoregulation in Protozoa

- Osmoregulation is the process of maintaing the water balance in the body.
- It is carried by Contractile Vacuole.

Contractile Vacuole → Contractile vacuoles are large, colourless, pulsatile fluid filled organelles in the most of the protozoans such as freshwater ciliates, sarcodina and flagellates.

- In sarcodina such as amoeba, simplest contractile vacoules are present, they are spherical in shape bounded by membrane, surrounded by circle of mitochondria.

Contractile vacuole of Amoeba

- In flagellates, like Euglena, contractile vacuole is surrounded by large no. of accessory contractile vacuoles.
- In ciliates, like Paramecium, contractile vacuoles are surrounded by radiating canals.

Mode of Working of Contractile Vacuoles –

1) Diastole :– The phase of enlargement to its maximum size.

2) Systole :– In this phase, relaxation occurs and fluid content is moved out.

Ans. 1 (b)

1) Pore bearing animals.
2) Their body is perforated by minute pores called ostia.
3) Have cellular grade of body origination
4) Have no respiratory, circulatory, excretory system.
5) Different types of cell types of present in porifera such as –

(i) Pinacocytes :– Large polygonal cells that line that pinacoderm.

(ii) Conocyte :- Collar flagellated cells that helps in creating the water current that enters the body through ostia and exit through osculum.

(iii) Archeocytes, Chromocytes, thesocytes etc cells are present in the body.

6) The characteristic feature of Porifera is presence of canal system — There are three types of canal system present in different groups —
(i) Ascon type
(ii) Sycon type
(iii) Leucon type.

7) Reproduction is both asexual and sexual in porifera.

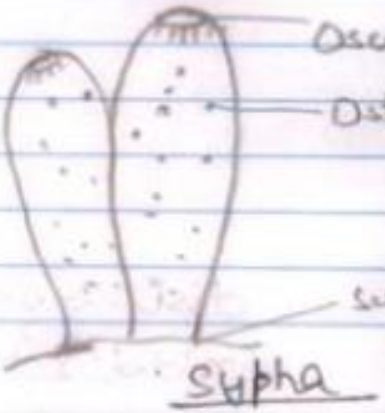
8) Asexual reproduction — By budding, fission, reduction bodies and gemmule.

9) Sexual reproduction is by producing ova and sperm.

10) Fertilization is internal ✓

11) Development is indirect.

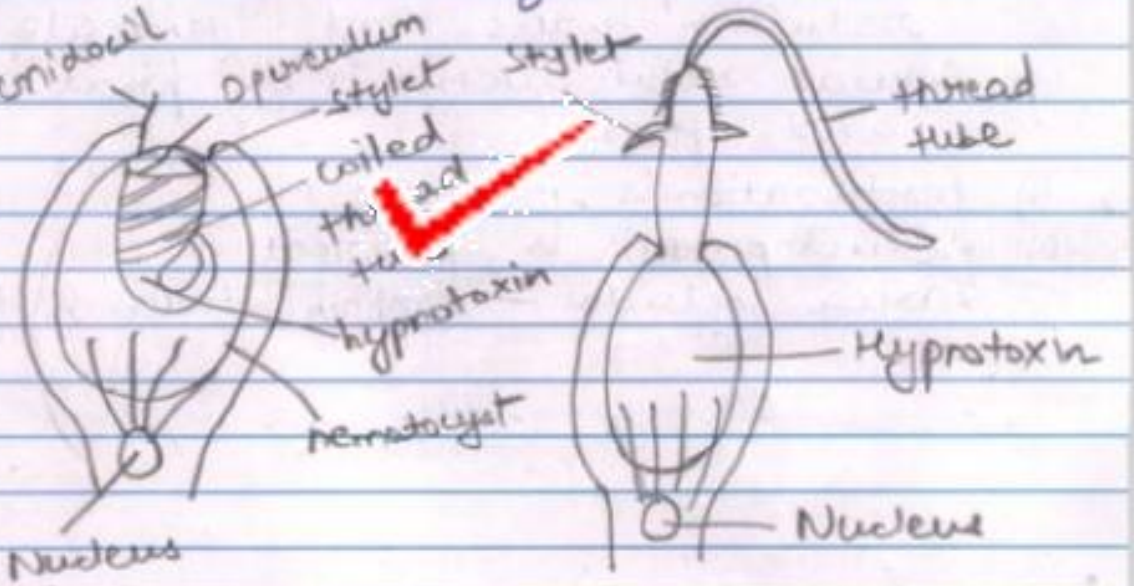
12) Larva includes — Amphiblastula & Parenchymula.



Sypha

Ans. 1 (c)

- Nematocyst is present in the cnidoblast cells of Cnidarians. such as Hydra.
- Nematocyst contained the coiled thread tubes.
- The outer wall of the cell has hair like structure called cnidocil which is sensitive to touch, when touched they known to fire the coiled thread tube that penetrate either the flesh of prey or predators of Cnidarians.
- The cnidoblast contain the poison called hyprotoxin that paralyses the captured prey.
- Function:- Nematoblast are predominantly used for capturing prey and defence but also for locomotion.



Undischarged Cnidoblast

discharged Cnidoblast

Paper Code
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5

Ans. 1(a)

Larval stages in Helminthes -

In Cestoda

The various types of larva present in cestoda

In Trematoda

→ Various types of larva present in Trematoda are -

1) Miracidium :- First larval stage in fasciola hepatica.
Body is conical, dorsoventrally flattened covered by ciliated epidermal plates.

2) Sporocyst :- Second larval stage, sac-like structure which give rise to next larval stage called radia larva.

3) Radia larva :- Elongated larva, containing germ balls which give rise to cercaria larva. Usually 14-20 cercaria produced from one radia larva.

4) Cercaria larva :- Oval shaped body with a tail for locomotion, ~~Alimentar~~ It give rise to next larval stage

called metacercaria.

Metacercaria :— Last larval stage in the life cycle of Fasciola hepatica Non-motile, covered by cyst. Metacercaria is injected by the definite host (humans).

Larval forms of Cestoda :—

There are three larval stages in Cestoda :—

1) Hexanth larva
2) Bladder worm larva
3) Cysticercous larva.

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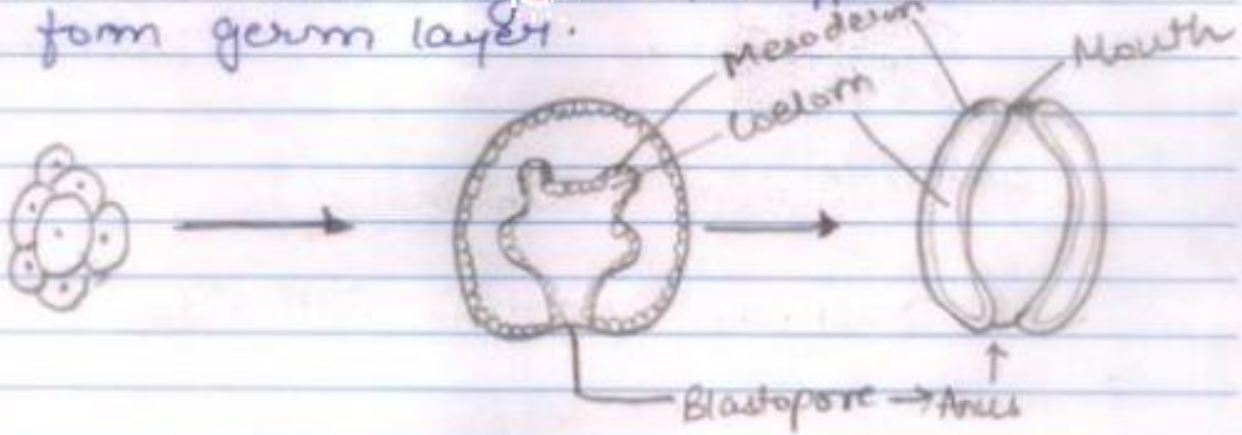
7

Ans. 1(e)

- The word Deutrosomes means 'second mouth'
- It is the superphylum of Animal kingdom which include all those animals which have bilateral symmetry and blastopore develops into anus.
- It includes ~~Echinodermata~~ Echinodermata and Chordata
- Radial cleavage of the zygote ⇒ Here the four cells of zygote undergo parallel and perpendicular divisions to the original axis of body symmetrically.
- Indeterminate cleavage :— Fate of cells is not predetermined and can be changed during early embryogenesis.
- The anus develops from the first cavity form by the blastopore, followed by the development of mouth on the other side.
- They are Entercoelom.
- Blastopore is the small indentation in the gastrula that migrate to opposite side to form germ layer.



Ans. 1 (t)

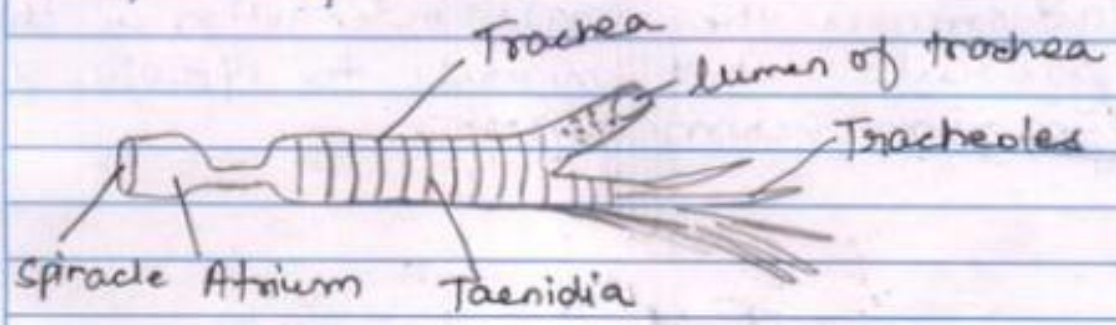
Respiratory organs in Arthropoda :-

Organs of Aquatic respiration :-

1) Gills
2) Epipodite
3) Branchiosteriogite
5) Rectal gills
5) Tracheal gills
6) Book gills
7) Blood gills
8) Body surface.

Organs of Aerial respiration :-

1) Tracheal system
2) Book lungs
3) Simple lungs
4) Plastron
5) Spiricular gills
6) Respiratory tubes.



Tracheal system in Arthropoda.

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9

Ans. 1 (g)

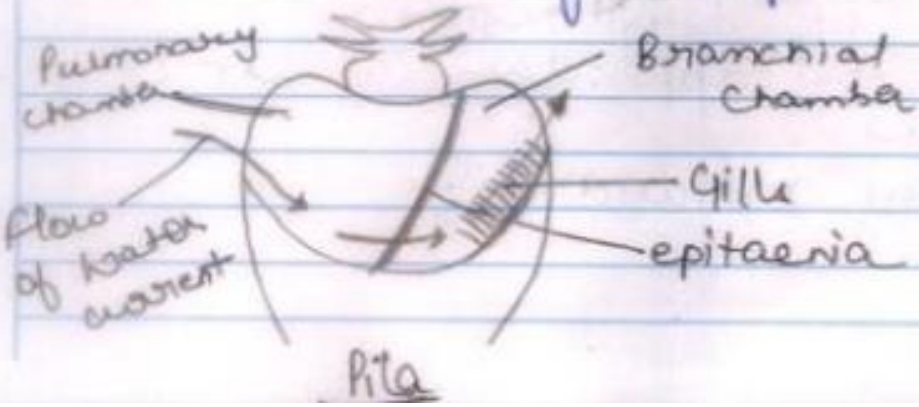
Functions of Mantle in Mollusca :—

1) Mantle helps in the cutaneous respiration in Mollusca — It occurs in Scaphoda, small Apalacopha, Ophisthobranchia etc.

2) Mantle is transformed into the pulmonary sac or lungs in aerial respiration. The contraction and relaxation of mantle, lower or raise it, which causes the water to rush in and out the mantle cavity.

3) The compression of mantle cavity increases the partial pressure of O_2 and facilitates its absorption.

4) In lower pulmonates (Pila) the mantle cavity is divided into right branchial chamber and left pulmonary chamber by epitaenia. The animal can breathe in water by gills and in air by lungs.



Ans. 1 (h)

Features of Rotifers –

1) These are microscopic organisms, mostly found in the fresh water rarely in marine or parasitic.
2) Body is divided into corona bearing head, trunk and foot.
3) Trunk is covered by lorica.
4) Foot has two toes.
5) Digestive system has highly muscular pharynx mastax with rigid trophi which helps in grasping and grinding the prey.
6) Excretory organs flame cells with protonephridia.
7) Parthenogenesis very common.
8) Sexes are separate.
9) No larval stage in the life cycle.

Affinites with Arthropoda :–

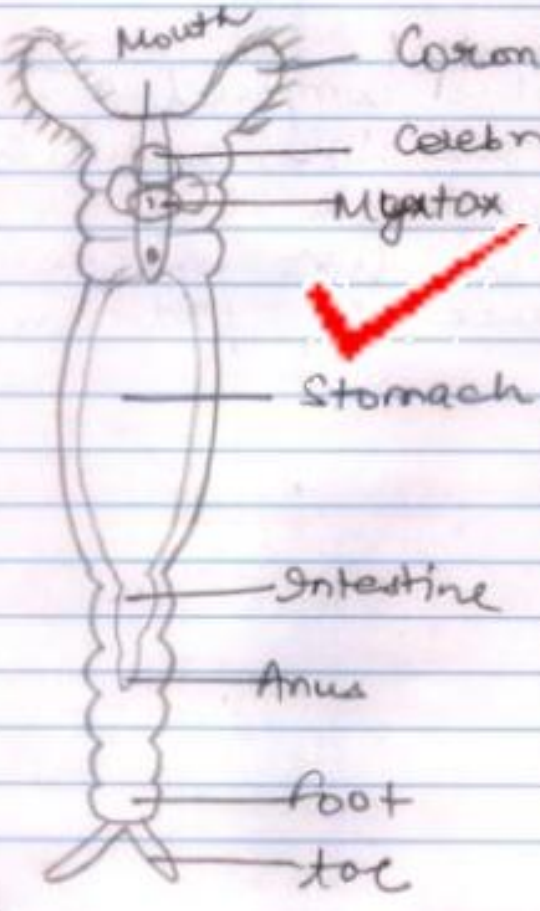
1) Presence of cuticle.
2) Presence of trophi.
3) Suggested the appendages of ~~or~~ Crustacean larva.
4) Superficial metamerism.

Affinities with Platyhelminthes –

1) The primitive type of corona may be derived from the complete or ventral ciliation in turbellarians.
2) Presence of trophi is common to both.

Affinities with Nematoda

1) ~~Synchial~~ Presence of gut with mouth and anus
2) Pseudocoelomate.
3) Synchial epidermis.
4) Absence of circulatory system and larval stages in both the cases.



Rotifer

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Ans. 1 (i)

- Tube feet helps in the locomotion in Echinoderms by providing the hydraulic pressure mechanism.
- Tube feet's thin surface layer also serves for respiratory gaseous exchange.
- Tube feet helps in anchoring the body to the substratum.
- Tube feet helps in capturing and handling the food.
- Tube feet is composed of three parts -
  (i) A sac like ampulla
  (ii) A middle tubular podium
  (iii) A cup like sucker at the base of podium.

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13

(SEC-B)

(Ans. 2)

Asexual reproduction :—

(i) Binary fission

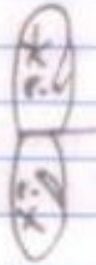
- It involves the division of the parent cell into two equal daughter cells.
- First Karyokinesis occur followed by Cytokinesis.
- Plane of division is different in different groups.

(i) Simple binary fission (ii) Longitudinal binary fission

In Amoeba

In Euglena

(iii) Transverse binary fission (iv) Oblique binary fission



Transverse division

In Paramecium

Oblique binary fission in Ceratium

(ii) Multiple fission

Here the nucleus first undergo a repeated binary fission or simultaneous multiple fission and become multinucleated cell after that the cell fragments are formed around each nuclei.

(iii) Plasmotomy.

Special type of binary fission in which multinucleate parent cell divides into two or more multinucleate daughter cells. Occurs in plasmyxa.

Plasmotomy.

(iv) Budding

It is the formation of one or more daughter individuals after the separation from the parent cell.

Can be – (i) Monotomic Budding
(ii) Multitomic Budding
(iii) Exogenous Budding
(iv) Endogenous Budding

Exogenous budding in Ephedrota.

Sexual reproduction:–

Can be two types – (i) Syngamy
(ii) Conjugation.

Syngamy:– Involves the union of two gametes and result in the formation of zygote. Based on the degree of differentiation displayed by the gametes can be –

(i) Isogamous – Two gametes are same morphologically but different in behaviour. Ex- Chlamydomonas Monocystis

(ii) Anisogamous:– Two gametes are morphologically different as well as different in behavior also –
Ex- Volvox, Plasmodium

Small gamete, motile ⇒ Male gamete
Large gamete, nonmotile ⇒ Female gamete

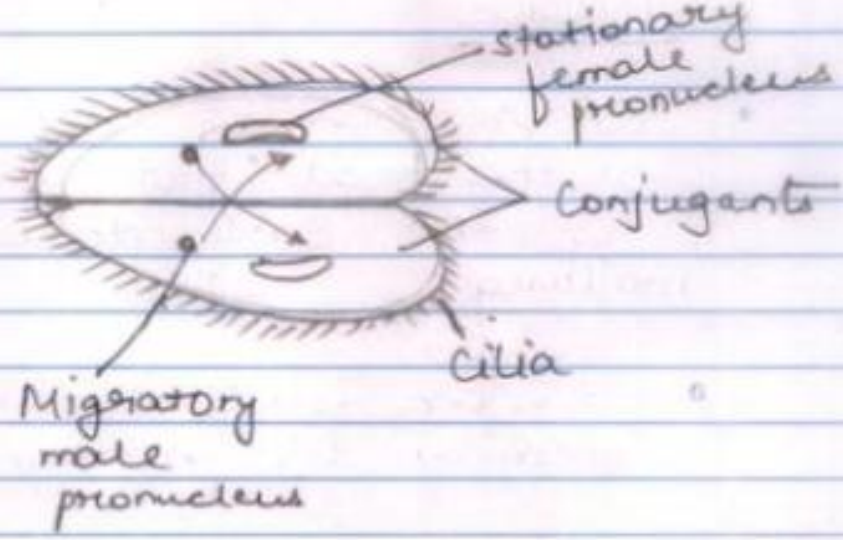
(iv) Autogamy:— Formed by the fusion of two gametes from same parent.
Ex- Actinophrys.

(v) Hologamy:— Well developed individuals itself act as a gamete and fuse together to form zygote.

Conjugation

- It is the temporary union of two individuals to exchange their genetic material.
- Occurs in Paramecium.
- The two paramecium come close and contact on their ventral side; both are called conjugants.
- Macronucleus disappears.
- Micronucleus divide to form male and female pronucleus.
- Male and female pronucleus fuse to form zygotic nucleus.
- Both conjugants separate from each other.
- Called exconjugants.
- Zygote divides thrice to form 8 nuclei,
- Out of which four form macronucleus
- Out of four micronucleus, three degenerate
- Remaining one divides ~~to form~~ with the binary fission of each conjugant.

- Each exconjugants produce 4 daughter cells.
- There are 2 conjugants therefore, total 8 daughter cells are produced in conjugation.



Binary fission in Paramecium

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18

(SECTION - C)
(Ans. 8)

Torsion

- 180° rearrangement of viscero-pallium on the head-foot long axis of the body in the early development of gastropod mollusca
- It is an fundamental and event in the ontogeny of gastropod molluscs.
- Most of the structures are affected by torsion certain structure which are lagged posterior are brought to the front
- The pre-torsion is bilateral symmetrical, mantle cavity is posterior and ventral, gut opens posteriorly.
- A ventral flexure of the body changes the straight alimentary canal to a loop, so that anus comes in front near the mouth.

Mechanism of Torsion

Rotation → First 90° by contraction of larval retractor muscles.

→ Second 90° by differential growth.

Position of Organs in the pre-torsion stage.

- Posteriorly located mantle cavity opens backwards, mouth and anus at opposite ends, ctenidium points backwards, auricles behind the ventricles.

- Nervous system bilaterally symmetrical, coiled visceral sac and shell exogastric and dorsal.

Position of Organs in the post-torsion stage

- Mantle cavity opens in front, just behind the head, mouth and anus come close to each other because the alimentary canal become U shaped, ctenidium shifts to anterior and the right one changes to left and vice-versa, auricles ~~behind~~ come in front of ventricles.

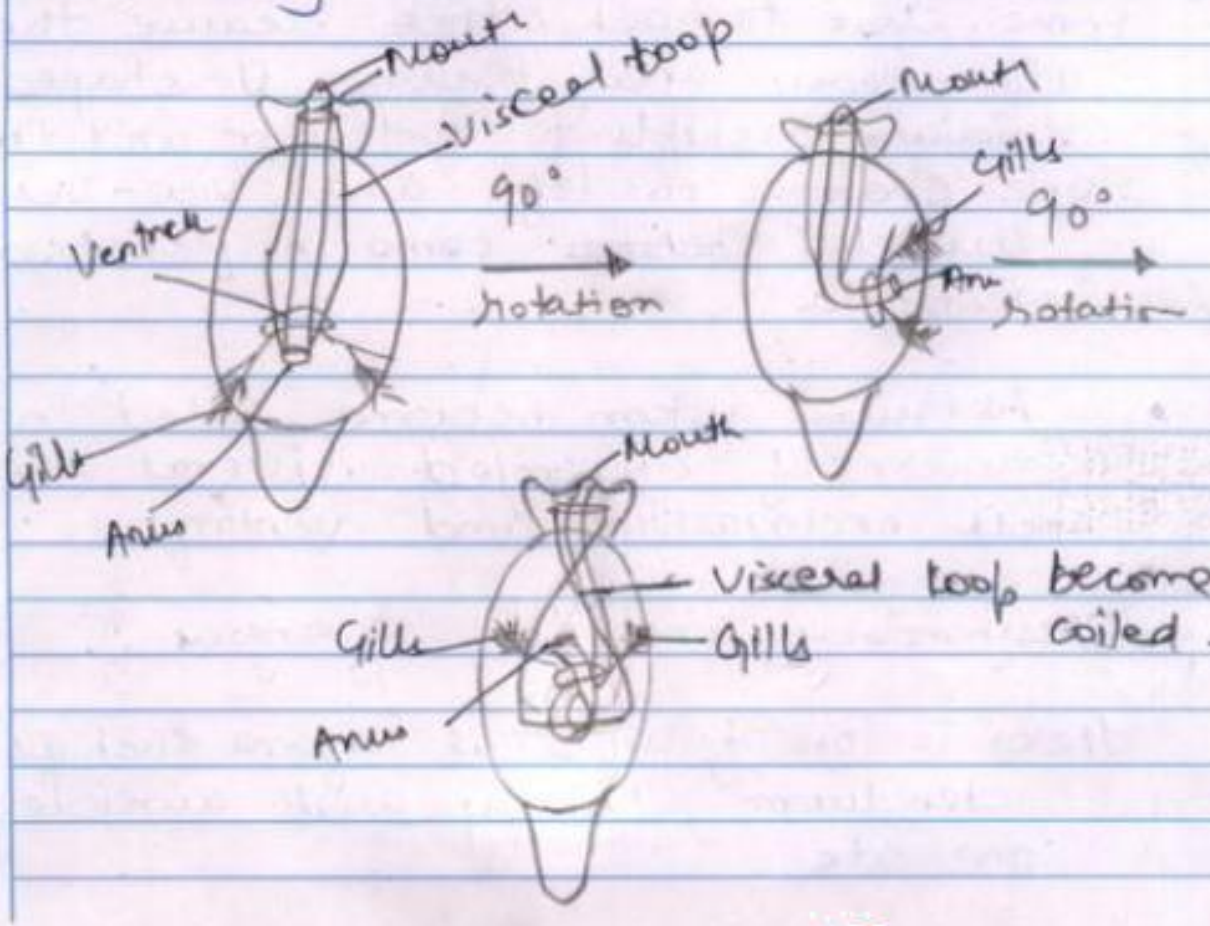
- Nervous system become coiled in the figure of 8, coiled visceral sac and shell endogastric and ventral.

Assymtary and loss of organs

There is loss of visceral organs such as ctenidium, kidney and auricle of one side

Significance of Torsion

- According to Garstang, Torsion first occured as a larval mutation of advantage to larva.
- Pre torsion larva fell an easy victim of predators.
- After torsion, the mantle cavity is come to front so that the delicate parts – head and velum could withdraw first followed by the foot.
- According to Morton, Torsion provides stability to adult.



Paper Code

21

Detorsion

- Detorsion is the reversion of torsion
- It is the characteristic of Euthyneura
- As a result of detorsion, the pallial complex moves back towards the posterior end
- Auricles lie behind the ventricles
- Ctenidium moves backward.
- Visceral loop become untwisted
- External secondary symmetry is reestablished.
- Torsion must be disadvantages to most of the adult snail, that why most of them undergo detorsion process.
- Different degree of detorsion is seen in Euthyneura.
- In least specialised form such as Ophistho-branchia and Pulmonata, the detorsion is incomplete, as a result the anus and ctenidium are directed laterally instead of anteriorly.
- Formly, this water taken as the ~~resti~~ arrest stage in ~~de~~ torsion, but the same reduction of pallial complex occurs in specialised forms Streptoneura.

Paper Code

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