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# Work Sheet: Bright Learners

Each Work sheet will be of **2 Pages**. You are requested to prepare **at least 2 work sheets for each chapter**. The content will be limited to **any specific topic within the chapter** which you think important. **No mark or Grade will be given. Only 5 Questions** per Work sheet will be prepared. Leave Space for students work.

***Type of Questions: MCQ/ Answer in a word or a sentence/ cross word puzzle/ fill in the blanks/match the following / one word substitution (terminology)/ Diagram labeling/True or false /or any other type decided by the teacher. QUESTIONS MAY BE BEYOND NCERT TEXT LEVEL.***

| Work Sheet: 1-A | Chapter No. 1 | Topic: Asexual Reproduction | Tinsukia Region |
|---|---|---|---|

1 Is vegetative reproduction a type of asexual reproduction ? How can you say so?

2 Answer the following in one word:
a) An unicellular organism which reproduce by budding.
b)Special hyphae on which spore formation takes place in *Penicillium*.
c) A multicellular organism which reproduce by budding.

3 Water hyacinth is one of the most invasive weeds found growing wherever there is standing water. How do they grow in water so rapidly?

4 Are the offsprings derived by asexual reproduction genetically same? How can you say?

5 State whether true or false:
a)Amoeba undergoes multiple fission under unfavourable conditions.
b)Conidia produced by *Penicillium* is motile.
c)There is no meiosis in fungus.

**ANSWERS**

1 Yes. Since the formation of the new individual does not involve two parents,the process involved is asexual

2 a) Yeast; b) Conidiophore; c) *Hydra*.

3 They reproduce asexually by their vegetative propagules called offset.

4 Yes.Since the offspring is a clone,so the offspring are the exact copy of their parent. 5 a)true b)false c)false.

| Work Sheet: 1-B | Chapter No. 1 | Topic: Sexual reproduction | Tinsukia Region |
|---|---|---|---|

1 The chromosome no. in the gamete of cat is 19. What will be the no. of chromosomes in their meiocyte?

2 Name the type of gametes that are formed in staminate and pistilate flowers.

3 Both frog and snake are unisexual animals.How do they differ in their type of gametic fusion? 4 Study the following diagram and answer the following question

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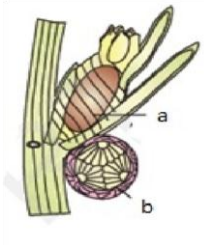


a)Name the male and female reproductive structures of *Chara*.

b)Is *Chara*, an algae, homothallic or heterothallic? Why?

5 Fill in the blanks:

a)The ploidy of a cell formed after syngamy is_____ and an endosperm formed after triple fusion in a dicot is_____.

b)The sex organs of a dioecious *Marchantia* are borne in_____thallus.

c)The turkey usually produces females for many generations ;such a phenomenon is called_____.

**ANSWERS**

1 38

2 Heterogametes

3 In frogs,gametic fusion take place in external medium(external fertilisation); In snakes, fertilisation occurs inside the body of the organism (internal fertilisation).

4 a)Male –Antheridium; Female- Archegonium.

b)Homothallic. Because male and female reproductive organs are found in the same individual organism.

5 a)2n(diploid);3n(triploid)

b)same

c)parthenogenesis.

| Work Sheet : 2-A | Chapter No. 2 | Topic: Flower | Prepared by: Tinsukia Region |
|---|---|---|---|

1 State the difference between actinomorphic flower and zygomorphic flower?

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3**Work Sheet- Bright Learners**

2 

What is a sessile flower? Give 2 examples.

3 What is hypanthium?

4 Name the branch of biology which deals with flowers and flowering plants.

5 What is the receptive part of the carpel?

| | | |
|---|---|---|
| | | **ANSWERS** |
| 1 | When a flower can be divided into two equal radial halves in any radial plane centre, it is said to be actinomorphic, e.g., mustard, *datura*, chilli. When it ca similar halves only in one particular vertical plane, it is zygomorphic, e.g., pea *Cassia*. | passing through the be divided into n two gulmohur, , bean, |

2 Sessile flowers are without a supporting stalk where as pedicellate flowers are supported by a stalk.

3 In some flowers, the stamens, petals, and sepals are fused into a "floral tube" or *hypanthium*.

4 Floriculture

5 Stigma

| **Work Sheet: 2-B** | **Chapter No. 2** | **Topic: Stamen** | **Tinsukia Region** |
|---|---|---|---|
| 1 | How does a monothecous anther differ from dithecous anther? | | |

2 What is difference between syngenesious and synandrous stamens?

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3 What are sterile stamens called as?

4 What is pollinia?

5 What is the difference between Didynamous and Tetradynamous stamens?

**ANSWERS**

1 When the anthers are two chambered, they are named as Dithecous and if they are single chambered, they are termed as Monothecous

2 Syngenesious – filaments are free but anthers are fused e.g. sunflower Synandrous – stamens are fused throughout the length e.g., cocks-comb.

3 Staminodes

4 In some plants, notably members of Orchidaceae and Asclepiadoideae, the pollen remains in masses called pollinia

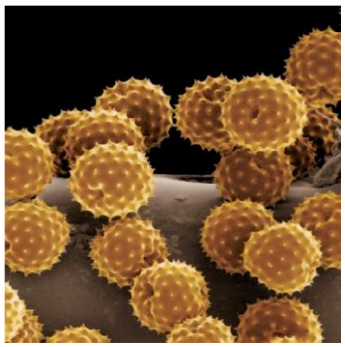
5 **Didynamous**: occurring in two pairs of different length.

**Tetradynamous**: occurring as a set of six filaments with two shorter ones.

| Work Sheet: 2-C | Chapter No. 2 | Topic: Microsporogenesis | Tinsukia Region |
|---|---|---|---|

1 Name the 4 wall layers of microsporangium.

2 Name the group of compactly arranged homogenous cells seen in the centre of microsporangium of young anthers

3 

What is the study of pollen grains called as?

Name the common disease caused due to pollen allergy.

What are palynivores?

4 Name the chemical composition of inner wall (intine) of Pollen grains

5 Generative cell in the pollen has two nuclei with different functions. Justify.

**ANSWERS**

1 Outside to inside. Epidermis, Endothecium, Middle layers and Tapetum

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2 Sporogenous tissue

3 Palynology.

Hayfever.

Many insects and some mites are specialized to feed on pollen, and are called palynivores.

4 Composed of Cellulose and Pectin

5 Generative e roductive) cell aining two nuclei: a tube nucle us (that produces the (rep tube) and cont t divides to form the two pollen m cells).
a gen rative nucleus sper
(tha

| Work Sheet: 2D | Chapter No. 2 | Topic: Pistil | Tinsukia Region |
|---|---|---|---|

1 With reference to Gynoecium in a flower, what is staminate?

2 State a difference between Apocarpous and Syncarpous ovary

3 Are Carpel and Pistil synonymous? If no justify

4 What is placentation?

Identify the types of placentations

A

B

5 What is the cavity of ovary called?

**ANSWERS**

1 Flowers that bear a gynoecium but no androecium are called carpellate. Flowers lacking a gynoecium are called staminate.

2 If a gynoecium has multiple, distinct (free, unfused) carpels, it is apocarpous. If a gynoecium has multiple carpels fused into a single structure, it is syncarpous

3 Each pistil is constructed of from one to many enrolled leaflike structures, or carpels.

The carpel is a single megasporophyll, or modified seed-bearing leaf.

A pistil then may be composed of one carpel (simple pistil), as in the sweet pea, or of two or more carpels (compound pistil) partially or completely joined, as in the mustard (two carpels) or lily (three carpels). Pistils in the collective sense form the gynoecium.

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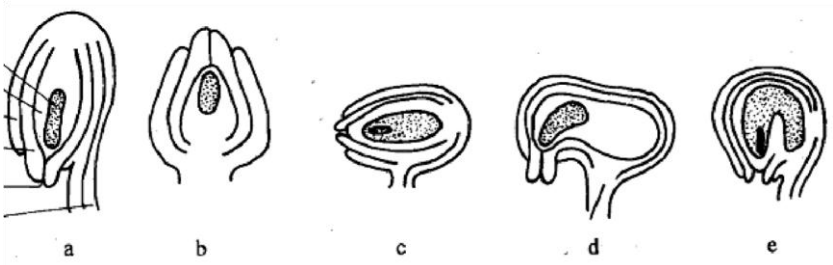
4 If the ovary is divided, with the ovules born on a line of placentation at the inner angle of each locule, this is axile placentation.
An ovary with free central placentation, on the other hand, consists of a single compartment without septae and the ovules are attached to a central column.

5 Locule

| Work Sheet: 2E | Chapter No. 2 | Topic: **Ovule** | Tinsukia Region |
|---|---|---|---|

1 What does the word Ovule derived from latin word *Ovulum* mean?

2




Identify the types of ovules given above.

3 Give the ploidy of
a.Nucellus
b.MMC (Megaspore Mother Cell)
c.Functional megaspore
d.Female gametophyte

4 In angiosperms, the female gametophyte develops from the megaspore. Typically, the mature female gametophyte consists of how many cells and how many nuclei? Name this type too.

5 If the Pollen tube enters through integuments or funiculus then what is this process called? How does it differ from Porogamy?

**ANSWERS**

1 The *ovule* is derived from Latin word *ovulum* meaning *small egg*

2 Anatropous, Orthotropous, Hemitropous,Camylotrophous, Amphitrophous

3 Nucellus – Diploid (2n)
MMC (Megaspore Mother Cell) – Diploid (2n)
Functional megaspore – Haploid (n)
Female gametophyte – Haploid (n)

4 7 celled -8 nucleate embryo sac (mature female gametophyte), Polygonum type of embryo sac 5
Entry of pollentube into the ovule: The pollen tube enters the ovule in 3 ways.
1. Porogamy -Pollen tube enters through micropyle. Eg: Ottelia.
2. Chalazogamy – Pollen tube enters through chalaza. This was discovered by

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Treub. Eg.Casuarinas

3. Mesogamy – Pollen tube enters through integuments or funiculus. Eg-cucurbita.

| Work Sheet: 2F | Chapter No. 2 | Topic: **Pollination** | Prepared by: Tinsukia Region |
|---|---|---|---|

1 What is the name given to the pollination by humans?

2 Brief the terms "pollinator" and "pollenizer".

3 Give examples of 2 bat pollinated plants.

4 What is co-evolution?

5 Snails pollinate flowers. Name the type of pollination.

**ANSWERS**

1 Anthropophily pollination by humans

2 The terms "pollinator" and "pollenizer" are often confused: a *pollinator* is the agent that moves the pollen, whether it be bees, flies, bats, moths, or birds; a *pollenizer* is the plant that serves as the pollen source for other plants.

3 Sausage tree(Kiglia pinnata), Musa,Cactus

4 The term coevolution is used to describe cases where two (or more) species reciprocally affect each other's evolution.
Eg- Orchid plant *Ophrys apifera* pollination by the solitary bee *Eucera* occurs in the Mediterranean area

5 Malacophilly.

| Work Sheet: 2G | Chapter No. 2 | Topic: **Outbreeding devices / Pollen Pistil Interaction / Artificial Hybridisation** | Prepared by: Tinsukia Region |
|---|---|---|---|

1 Differentiate between Herkogamy and heterostyly?

2 How does protandry differ from protogyny?

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3 What is Pollen-pistil interaction?

4 Which structure present at the micropylar part of the synergids guides the entry of pollen tube?

5

Why is bagging done in the process of artificial hybridization?
What is heterosis or hybrid vigour? Who coined this term?

**ANSWERS**

1 Herkogamy: arrangement of male and female flowers at different heights to prevent self pollination is called Herkogamy.
Heterostyly: presence of styles in different lengths in the flowers of the same species is called Heterostyly.

2 This is a phenomenon which takes place in a bisexual / monoecious / hermaphrodite organisms (plant / animal) to avoid self-fertilisation / autogamy .In this phenomenon either male or female reproductive organ develope earlier then the other .When its the female reproductive organ that develope first the condition is protogyny whenever its the male reproductive organ which develope first then it is said to be protandry.

3 All these events–from pollen deposition on the stigma until pollen tubes enter the ovule–are together referred to as pollen-pistil interaction.

4 Filiform apparatus

5 Emasculated flowers have to be covered with a bag of suitable size, generally made up of butter paper, to prevent contamination of its stigma with unwanted pollen.

Heterosis, hybrid vigor, or outbreeding enhancement, is the improved or increased function of any biological quality in a hybrid offspring.
G.H. Shull

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 2-I | No. 2 | **Double Fertilisation** | Tinsukia Region |

1 Name the scientists who discovered
   a) Triple fusion
   b) Double fertilisation

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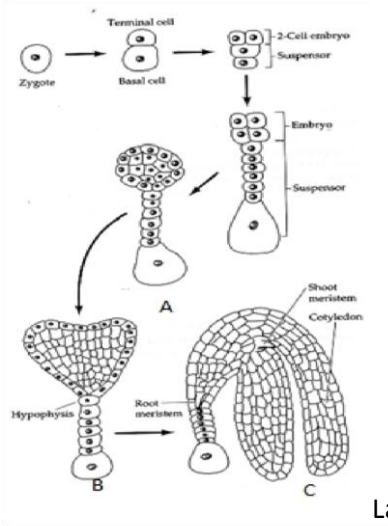
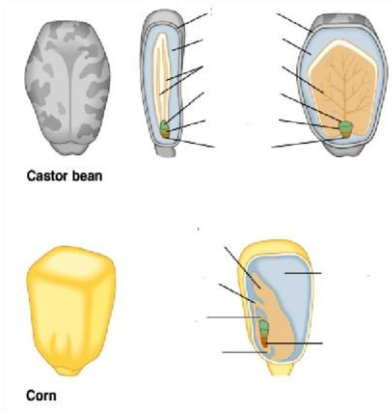
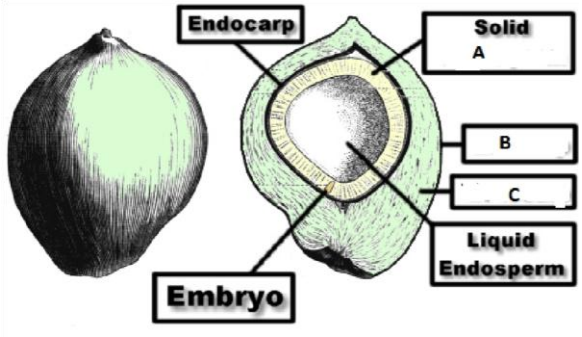
2 


Label A, B and C of the developing Dicot embryo

3 


Above is the diagram of dicot and monocot seed. Label

4 Give the ploidy of endosperm? How many types of endosperms are noted in flowering plants?

5 


**ANSWERS**

1 a)Nawaschin
b)Strassburger

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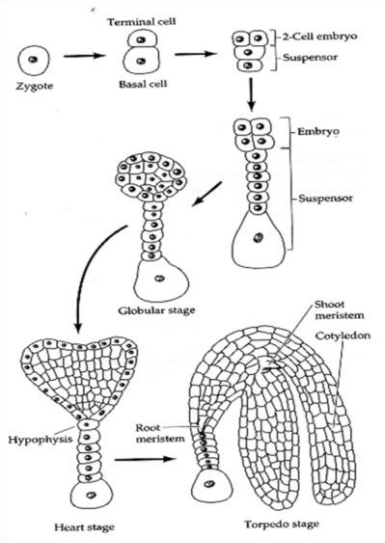
2

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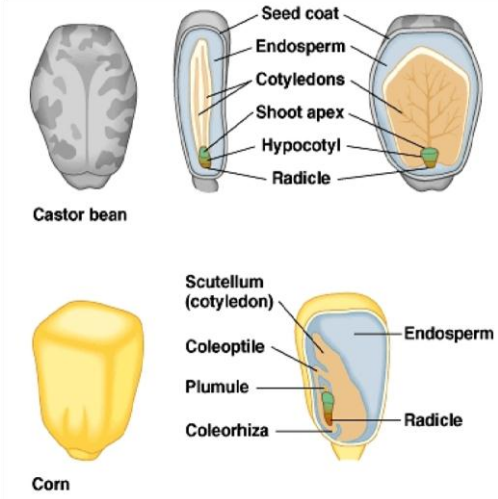
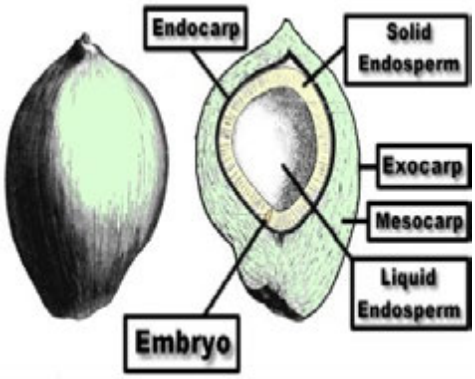



4 Triploid

3 types- Cellular, Nuclear and Helobial 5




| Work Sheet: | Chapter | Topic: | |
|---|---|---|---|
| 2J | No. 2 | **Seed** | Tinsukia Region |

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1 What is perisperm? Give 2 examples.

2 What do epigeal and hypogeal germination mean?

3 What is dormancy?

4 Give two examples of fruits with fleshy pericarp.

5  

Name the structure which develops into a fruit in these false fruits?

**ANSWERS**

1 The persistent nucellus is called the perisperm Black pepper and Beet

2 The bean shows **epigeous** germination, in which the cotyledons emerge from the soil, following the arch of the hypocotyl.

The pea shows **hypogeous** germination, in which the cotyledons stay underground because it is the *epicotyl* that arches out, protecting the delicate meristem--leaving the cotyledons behind.

3 A dormant seed is one that is unable to germinate in a specified period of time under a combination of environmental factors that are normally suitable for the germination of the nondormant seed.

4 In fleshy fruits, the outer and often edible layer is the pericarp, which is the tissue that develops from the ovary wall of the flower and surrounds the seeds. Some edible "vegetables" such as the cucumber, squash, and tomatoes are actually botanical fruits.

5 Thalamus

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 2K | No. 2 | **Parthenocarpy/Apomixis/Polyembryony** | Tinsukia Region |

1 Who discovered Polyembryony in plants?

2 Who coined the term Apomixis?

3 Parthenocarpy is sometimes claimed to be the equivalent of parthenogenesis in animals. Is it true?

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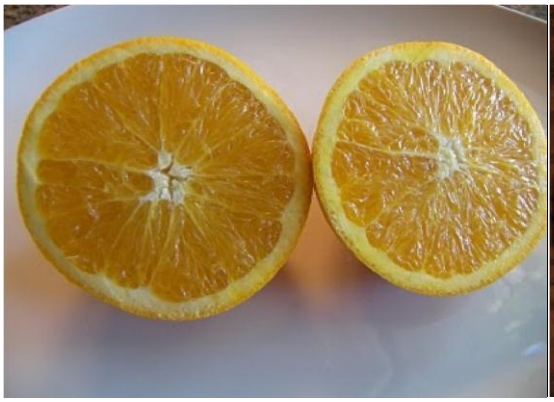
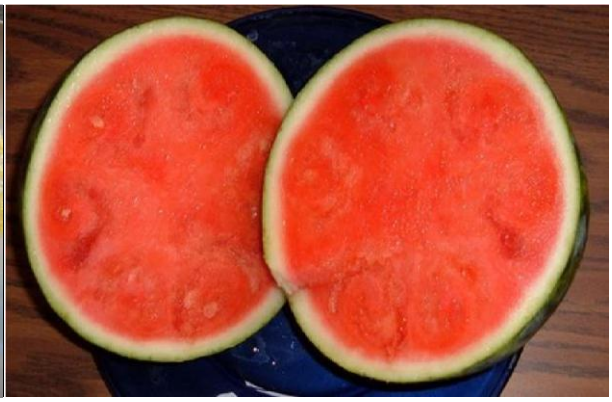
4  

Observe the above pictures.Do they have seeds? Give the term used to describe such fruits and define it.

5 In the case of polyembryony, an embryo develops from the synergid and another from the nucellus. Which is diploid and which is haploid?

**ANSWERS**

1 The polyembryony phenomenon was discovered by Leeuwenhoek in 1719, who observed the formation of two plantlets from the same citrus seed

2 The term Apomixis was by Hans Winkler

3 Parthenocarpy is sometimes claimed to be the equivalent of parthenogenesis in animals. That is incorrect because parthenogenesis is a method of asexual reproduction, and parthenocarpy is not, except in rare cases such as pineapple. The plant equivalent of parthenogenesis is apomixis.

4 Parthenocarpic fruits.

In botany and horticulture, parthenocarpy (literally meaning virgin fruit) is the natural or artificially induced production of fruit without fertilization of ovules. The fruit is therefore seedless

5 Synergid embryo is haploid and nucellar embryo is diploid

| Work Sheet: 3-A | Chapter No. 3 | Topic: Male and female Reproductive System | V Kumar Region Tinsukia |
|---|---|---|---|

1 Choose the write anwer-

i) Which cells of testes secrete androgens?

a) sertoli cells b) leydig cells c) mast cells d) spermatogonia

ii) Which is the site of fertilization in human being?

a) uterus b) vagina c) ampulla –isthmus junction d) cervix

2 # The path of sperm transport is given below. Provide the missing steps in blank boxes.

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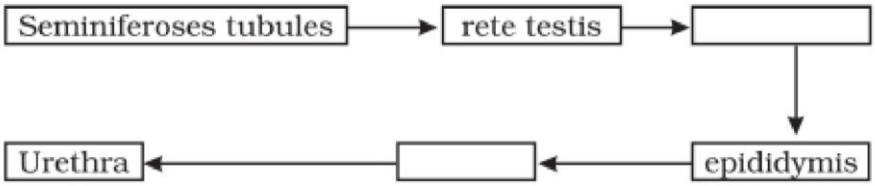


3 Fill the gaps –

i)Seminal plasma constitute _____,_____ and enzymes.

ii) Lower narrower part of uterus is called_____.

4 #Match the followings

a) Spermatogonia i) bulbourethral gland

b) Cells that nourish the developing sperm ii) vasa efferentia

c) Lubrication of penis iii) male germ cells

d) Rete testes opens into iv) sertoli cells

5 Give correct term for the followings-

i) The layer of uterine wall which undergoes cyclic changes during menstrual cycle.Sii) The cushion-like fatty tissue with pubic hair in female reproductive system.

6 Give answer in one word-

i)Why testes do lies outside the body? ii) Where is fimbrae found and what role does it play?

**ANSWERS**

1 i)b) leydig cells

ii) c) ampulla –isthmus junction 2 Vasa efferentia, Vasa differentia.

3 i)Fructose ii) Ca. Cervix.

4 a)iii b)iv c)i d)ii

5 i)Endometrium ii) Mons pubis.

6 i)To obtain 2-3$^0$ less temperature than normal body temperature which facilitate sperm formation. ii) It is finger-like structure found in fallopian tube, it is helpful to collect ova.

| Work Sheet: 3-B | Chapter No. 3 | Topic: Gametogenesis and Menstrual cycle | : V Kumar Region Tinsukia |
|---|---|---|---|

1 Give answer for the followings—

i) How can you differentiate between secondary and tertiary follicles formed during oogenesis?

ii) Midd3e piece is a part of sperm, What role does it play?

2 # What does A to F represent in Oogenesis process?

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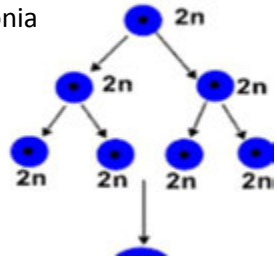
Oogonia




A

B

C

D

E

F

3 Fill the gaps –

i) In the mid of menstrual cycle the level of LH reach to its peak that is called_____.

ii) Empty Graafian follicle turned into _____, and act as an endocrine gland.

4 Write true or false---

i) Oogenesis starts from embryonic period of a female child. True/Falseii) Antrum is the fluidy filled cavity found in sperm. True/False

iii)Polar body contains 23 chromosomes. True/False

iv) Menopause is the onset of puberty. True/False

5 Give correct term for the followings-

i) Give term for conversion of spermatid into sperm.ii) The membrane by which secondary oocyte surrounded during development of ova.

**ANSWERS**

1 i) Secondary follicle – Surrounded by few granulose cell layers. Without having antrum. Tertiary follicle - Surrounded by many granulose cell layers divided as theca externa and theca interna, Having with antrum.

ii) Provides energy to tail for movement of sperm.

2 A- Mitosis B- Primary oocyte C-Meiosis-I D-Sec oocyte E-Meiosis-II F-Ova/ootid

3 i)LH Surge ii) Corpus luteum.

4 i)True ii) false iii) True iv) false. 5 i)Spermeiogenesis

ii) Zona pellucida.

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 3C | No. 3 | Fertilization and Implantation | Region Tinsukia |

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1 Give answer for the followings—

i) In which state zygote get implanted in human female?

ii) How is cleavage different from mitosis?

2 Choose the right answer-

# Blastula is the cavity found in---

a) Morula b) zygote c) blastocyst d) gastrula 3

Give correct term for the followings-

# Blastomeres of developing embryo arranged into a outer cell layer and a group of cells in a pole, give term for both.

4 Fill the gaps –

# In human beings ovulation takes place in the form of _____.

5 Write true or false---

i) Zygote implanted in fallopian tube of human female. True/False

ii) Progestogen is necessary for implantation. True/False

**ANSWERS**

1 i) Blastocyst/Blastula ii) In cleavage the size of dividing cells gradually decrease but does not in mitosis.

2 c) blastocyste

3 Trophoblast and Inner cell mass.

4 Secondary oocyte.

5 i) False ii) True.

| Work Sheet: | Chapter | Topic: | |
|---|---|---|---|
| 3D | No. 3 | **Embryonic development and Parturition** | Tinsukia Region |

1 Fill the gaps –

i)The structure which provides vascular connection between fetus and uterus is called _____ ii) In the later phase of pregnancy a hormone ---------- is secreted from ovary.

2 Give term for the statements-

i) An intimate connection between mother and foetus.

ii)The cells of inner cell mass capable to develop whole embryo.

3 Give answer for the followings-

i)Enlist the hormone secreted only during pregnancy in human female.

ii)Why does initial days milk recommended by doctor? Give term for this.

4 Write true or false---

i)Relaxin triggers the contraction during parturition. True/False

ii) Heart beat of foetus can be listen at the end of first month of gestation period. True/False

5 Choose the right answer-

i)Which hormone is not secreted by placenta-

a)estrogen b)hPL c)hCG d)relaxin

**ANSWERS**

1 i)Umblical cord ii)relaxin

2 i)Placenta iii)Stem cells

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3 i)hCG and hPL

ii)Because it is having with specific antibodies which enhance the immunity of the baby. Colostrum.

4 i)False ii)True

5 i) d)relaxin

| Work Sheet: 4-A | Chapter No. 4 | Topic: Contraceptive Devices | Prepared by: Guwahati Region |
|---|---|---|---|

1 Short answer questions----

(a)What is the causes of implantation bleeding.

(b)Define lactation amenorrhea.

2 Expand the terms----

a) CDRI _____

b) MMR_____

c) IUD_____

d) ICSI._____

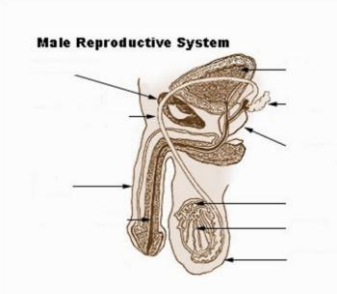
3

Give the characters of " Ideal Contraceptives".

4 Match the following:-

| Column A | | Column B |
|---|---|---|
| 1) Cutting and tying of vas diferens | a. | Tubectomy |
| 2) Removal of testis | b. | Vasectomy |
| 3) Cutting and tying of oviduct | c. | Castration |

5 Which part of this diagram is surgically blocked and why?

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| Work Sheet: 4-B | Chapter No. 4 | Topic: **Infertility** | Prepared by: Guwahati Region |
|---|---|---|---|

1 Pick the correct answer:

1) At what cell stage an embryo is implanted in ZIFT..

(a) 8 (b) 16 ( C) 32 (d) 48

2) During GIFT Which of the following is transferred in female…..

(a) Embryo ( b ) zygote ( c) ovum ( d ) sperm

2 Fill in the blanks……

1) The introduction of sperm in to vagina is known as…… 2. The unability to produce children is called……..

3. In – vitro fertilization followed by embryo transfer in to the female genital tract is known as……..programme.

3 True and false…….

A. Artificial insemination occur in male with high sperm count.

B. Transfer of zygote in to fallopian tube is called GIFT.

4 Why is the name 'test tube baby' a misnomer?

_____

_____

_____

_____

_____

5 Identify the technique showed by the following diagram / Photograph


_____

| Work Sheet: 6-A | Chapter No. 6 | Topic: Molecular Basis of Inheritance | Kolkata Region |
|---|---|---|---|

1 Why are histone positively charged ?

2 Regulation of lac operon by repressor is referred to as negative.

3 Differentiate between template strand and coding strand.

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4 A cistron consist 20 codons . How many amino acids will it code in the polypeptide transcribed?

5 If a double stranded DNA has 20 percent cytosine, calculate the percent of adenine in DNA.

**ANSWERS**

1 For wrapping of negatively charged DNA, histone protein is also rich in lysine and arginine carrying positive charge in its chain.

2 The gene that codes for the repressor protein that binds to operator and suppresses its activity, as a result transcription will be switched off.

3 a)Template strand show 3-5 polarity and coding shows 5-3 polarity b) template strand takes part in transcription and coding strand does not.

4 19 – amino acid, because last codon on mRNA will be a terminating codon.

5 Accoding Chargaff"s rule=A+T=100-(G+C) C=20/hence G=20/ A+T=100-20=60 hence A=60/2=30/

| Work Sheet: 6-B | Chapter No. 6 | Topic: Molecular basis of Inheritance | Prepared by: Kolkata Region |
|---|---|---|---|

1 What is hnRNA ?

2 Write about intron?

3 Differentiate between genetic code and codon.

4 What are UTRs?

5 Distinguish between VNTR and Probe.

**ANSWERS**

1 The precursore RNA transcribed by RNA polymerase that contain both exons and introns.

2 The non-coding sequences in eukaryotic structural gene are called introns.

3 Genetic code is the sequence of base triplet in DNA molecule which determined a polyptides where as triplet base on mRNA that code for a partcular amino acid is called codon.

4 mRNA has some additional sequences that are not translated are called UTRs. UTRs are present at both end.

5 VNTR;- The segment of DNA which shows very high repetitive nucleotide sequences vary from person to person, called VNTR.

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**Work Sheet- Bright Learners**

PROBE—small segment of DNA which are very specific complimentary to VNTR sequences are called probe.

| Work Sheet: 8-A | Chapter No. 8 | Topic: Life cycle of Plasmodium | Ranchi Region |
|---|---|---|---|

1 Which species of malarial parasite cause malignant malaria?

2 Name the toxic substance released by the repture of RBCs which is responsible for the symptoms of malaria.

3 Who discovered malarial parasite ?

4 Name the plant from which quinine is prepared.

5 How larvae of mosquito can be controlled through biological means?

| Work Sheet: 8-B | Chapter No. 8 | Topic: Acquired Immuno Deficiency Syndrome | Ranchi Region |
|---|---|---|---|

1 What do you mean by window period in HIV Infections .

2 Why mosquito bite is unable to spread the infection of HIV ?

3 Why the HIV vaccine has not yet been prepared ?

4 Which is the most common reason of HIV infection .

5 Write some commonly used medicines for HIV Infected person prescribed by qualified doctors.

| Work Sheet: 9A | Chapter No. 09 | Topic Plant breeding | Ranchi Region |
|---|---|---|---|

1 Q1.Define biofortification.

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2 Q2.Expand IRRI ,from where the IR-8 a rice variety was developed.

3 Q3.How is Single cell protein useful to us?

4 Q4.What do you mean by somatic hybridisation?

5 Q5.Name the two hybrid plants of Okra(Bhindi) ?

**ANSWERS**

1 Breeding crops with higher levels of vitamins,minerals protein and fats to improve public health.
2 International Rice Research Institute.
3 Alternate source of protein for animal and human nutrition.
4 The production of new plants by the fusion of protoplasts of two different plats having a desirable characters.
5 Pusa sawani and Pusa A-4.

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| | |
|---|---|
| 6 | i)Breed ii)inbreeding depression<br>iii)Apiculture iv)green revolution v)hone |

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1 The immune system of a person is suppressed. In the ELISA test, he was found positive to a pathogen. Which cells of the body are affected by the pathogen?

2 What would happen to immune system, if thymus gland is removed from the body of a person?

3 If a regular dose of drugs or alcohol is not provided to an addicted person, he shows some withdrawl symptoms. List any four such withdrawal symptoms.

4 In the metropolitan cities of India, many children are suffering from allergy/asthma. What are the main causes of this problem. Give some symptoms of allergic reactions.

5 Life style diseases are increasing alarmingly in India. We are also dealing with large scale malnutrition in the population. Is there any method by which we can address both these problems?

**ANSWERS**

1 Helper T lymphocytes

2 Thymus is the primary lymphoid organ. In thymus gland, immature lymphocytes differentiate into antigen-sensitive lymphocytes. If thymus gland is removed from the body of a person, his immune system becomes weak. As a result the person's body becomes prone to infectious diseases.

3 The withdrawal symptoms are:
a. Anxiety b. Shakiness c. Nausea d. Sweating

4 Allergy is the exaggerated response of the immune system of certain antigens present in the environment. In metropolitan cities life style is responsible in lowering of immunity and sensitivity to allergens. More polluted environment increases the chances of allergy in children. Some symptoms of allergic reactions are sneezing, watery eyes, running nose and difficulty in breathing.

5 The answer to address both these problems is called biofortification. This area looks at improving food quality with respect to protein, oil, vitamin, micro nutrient and mineral content. The oils need to be rich in omega 3 fatty acids which are good for heart. Similarly, proteins should have more of lysine and tryptophan (essential amino acids). Many varieties of maize, carrots and spinach have been released which fulfill the above criteria.

| Work Sheet: 10-B | Chapter No. 10 | Topic: BIOLOGY IN HUMAN WELFARE | Prepared by: SILCHAR Region |
|---|---|---|---|

1 Do you think we, human beings, are able to digest the cellulose present in our foods? Why or why not ?

2 Baculoviruses are the pathogens that attack on plants and also are used for biocontrol. How both antagonistic functions are performed ?

3 Three water samples namely river water, untreated sewage water and secondary effluent discharged from a sewage treatment plant were subjected to BOD test. The samples were labelled A, B and C; but the laboratory attendant did not note which was which. The BOD values of the three samples A, B and C were recorded as 20mg/L, 8mg/L and 400mg/L, respectively. Which sample of the water is most polluted? Can you assign the correct label to each assuming the river water is relatively clean?

4 The Ministry of Environment and Forests has initiated Ganga Action Plan and Yamuna Action Plan to save these major rivers. How was the target fulfilled ?

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5 What are the negative impacts of biological control ?

**ANSWERS**

1 We lack cellulase enzyme for digestion due to nonfunctioning of appendix.
2 Baculovirus like Nucleopolyhedral virus are- species specific, narrow spectrum, effective only against insects and arthropods.
3 Most polluted water : 400 mg/L of secondary effluent (c). A (River water) : 08 mg/L; b (Untreated sewage water) : 20 mg/L.
4 Decreasing pollution, Sewage treatment and utilization of treated water.
5 May develop resistant insect varieties, may be lethal / harmful for human beings.

**Work Sheet: 11-A** **Chapter No. 11** **Topic: : Restriction Enzymes** **Prepared by: Bhubaneswar Region**

1 Which Enzyme Produces sticky Ends in DNA for Foreign DNA Insertion?

2 Name the enzyme that joins the sticky ends to form recombinant DNA.

3 5′ —— G ↓AATTC —— 3′3′ —— CTTAA G —— 5′
↑
Name the Enzyme that cuts at the points marked in arrows.

4 Match the following:

| | |
|---|---|
| a)Ti Plasmid | i)Removes wall of Fungus. |
| b)Biolistics or gene gun | ii)Beta galactosidase gene |
| c)Insertional inactivation | iii)insertion of recombinant DNA in Plant cell |
| d)Chitinase | iv)*Agarobacterium tumifaciens*. |

5 Ori sequence is responsible for controlling the copy number of the linked DNA.True/False

**ANSWERS**

1 Restriction Endonuclease
2 DNA Ligase
3 EcoRI
4

| | |
|---|---|
| a)Ti Plasmid | iv)*Agarobacterium tumifaciens* |
| b)Biolistics or gene gun | iii)insertion of recombinant DNA in Plant cell |
| c)Insertional inactivation | ii)Beta galactosidase gene |
| d)Chitinase | i)Removes wall of Fungus. |

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5 True

| Work Sheet: 11-B | Chapter No. 11 | Topic: Cloning Vectors | Bhubaneswar Region |
|---|---|---|---|

| | |
|---|---|
| 1 | Name two selectable markers used in cloning vector. |
| 2 | Extention /Denaturation/annealing ,arrange the steps of PCR in proper order according to their occurance. |
| 3 | Exonucleases remove nucleotides from the ends of the DNA.True/False |
| 4 | Chomogenic substance produces blue colour by the action of beta galactosidase in non recombinant colony.True/False |
| 5 | Match the followings:-<br>For the removal of cell wall<br>a)Lysozyme i)Plant cells<br>b)Cellulase ii)Fungus<br>c)Chitinase iii)Bacteria |

1 Amp-r & tet-r

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**ANSWERS**

2 Denaturation/annealing/ Extention

3 True

4 True

5 a)Lysozyme iii)Bacteria
b)Cellulase i)Plant cells
c)Chitinase ii)Fungus

| Work Sheet: 12-A | Chapter No.1 2 | Topic: Biotechnological Applications in Agriculture& Medicine | Bhubaneswar Region |
|---|---|---|---|

1

Name the Nematode that Infects Roots of Tobacco plant.

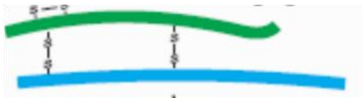
a) *Meloidegyne incognitia*

b) *Agarobacterium tumifaciens*

c) *Bacillus thuringiensis*

d) Non of the above

2



Name the two strands present in the above matured Insulin.

3 Why insulin is not administer orally to diabetic people?

4 ELISA is used to diagnose_____.HIV/Malaria/Syphillis/Catract.

5 In which medium Bt protoxin converted into active toxin and kills bollworm larva? a)Alkaline
b)Acidic
c)Neutral
d)None of the above.

6. Choose the right process for permanent cure of ADA deficiency(SCID).
a)Gene isolate from bone marrow cells producing ADA is introduced into cells at early embryonic stage.
b)Bone Marrow transplantation.
c)Enzyme replacement therapy.
d)None of the above

1 a) *Meloidegyne incognitia*

2 A-Polypeptide strand and B-polypeptide strand

3 It will be digested by protease action in GI tract.

**ANSWERS**

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4 HIV

5 a)Alkaline

6 a)Gene isolate from bone marrow cells producing ADA is introduced into cells at early embryonic stage.

| Work Sheet: 12B | Chapter No. 12 | Topic: Transgenic Animal and Ethical Issues | Bhubaneswar Region |
|---|---|---|---|

1 GEAC stands for.

a)Ground Environment Action Committee

b)Genetic Engineering Approval Committee

c)Genetic Engineering Appaisal Committeee

d)Genetic and Environment Approval committee

2

The first transgenic cow, Rosie, produced human protein-enriched milk (2.4 grams per litre). The milk contained the human alpha-lactalbumin and was nutritionally a more balanced product for human babies than natural cow-milk. True/False.

3

Transgenic_____ are being used to test the safety of the polio vaccine. Mice/Cat/Tiger/Horse

**ANSWERS**

1 b)Genetic Engineering Approval Committee

2 True

3 Mice

| Work Sheet: 13-A | Chapter No. 13 | Topic: Population interactions | Prepared by: Guwahati Region |
|---|---|---|---|

1

Fill in the table……..

| Species A | Species B | Name of interaction |
|---|---|---|
| + | ? | Mutuallism |
| + | - | ? |
| ? | 0 | Commensalism |
| + | 0 | ? |
| - | ? | Competition |

2 Select the correct statement for parasitism ……..

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1. Both organisms are benefited 2. One benefited and other is harmed 3. One benefited and other is neither harmed nor benefited

3 Match the following……

| A | B |
|---|---|
| 1Lichen | a. Parasitism |
| 2.Koel and Crow | b. Mutualism |
| 3.Lice on human | c. Commensalism |
| 4.Epiphyte on a mango branch | d. Brood parasitism |

4

1. Predator in nature is prudent". Justify the statement.

_____

_____

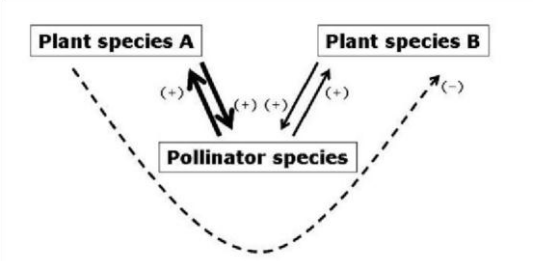
2.How does Monarch butterfly defend their body from predators.

_____

_____

_____

5 Name the population interactions that you can identify from the diagram.




| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 13B | No. 13 | **Biotic and Abiotic factor** | Guwahati Region |

1 Differenciate between the followings…

1.Stenothermal and Eurythermal animal

2.Stenohaline and Euryhaline animals

2 Define the given terms……..

!. Immigration

2. Emigration

3. Migration

4. Suspension

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3 Fill in the blanks…….

1.Animal whose body temperature changes with the surrounding are ……..

2.Biomass is the measure of …… size.

3.Population size is technically called population ……..

4. Hibernation is the another name of ……..sleep.

.

4 Identify the type of suspension….

5 True / False

1. Green plants occur in deeper strata in ocean.
2. Organisms maintain constant body temperature by homeostasis.
3. Fresh water animals can also leave in sea water.
4. Water holding capacity does not depend on grain size.

| Work Sheet: 14-A | Chapter No. 14 | Topic: **Energy Flow** | Prepared by: Guwahati Region |
|---|---|---|---|

1

Define the following terms…….

1. PAR
2. Standing crop
3. Food web
4. Ecological pyramid

2 Identify the type of food chain given below.

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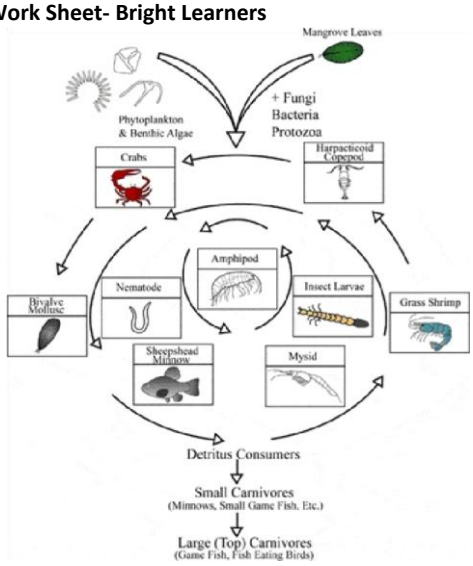
**Work Sheet- Bright Learners**




How do they help to reduce pollution?

3 Draw a food web showing energy flow through different trophic levels.

4 Give the reason….

1. The pyramid of biomass in sea is generally inverted.
2. Tree pyramid for number is different from grass land pyramid.

5 Fill in the blanks…….

1.Primary carnivores are …… consumers.

2.Unidirectional flow of energy from the sun to producer and then to consumer is the …….law of thermodynamics.

3.Standing crop is measured as the …… of living organisms.

4. Decomposition is largely an ……. requiring process.

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 14B | No. 14 | **Ecological Succession** | Guwahati Region |

1 Stdu the following diagram and answer the questions below.

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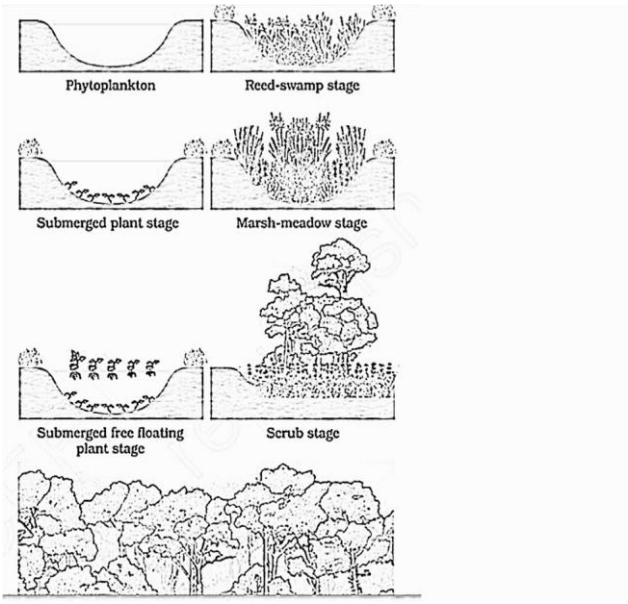
**Work Sheet- Bright Learners**




a) What ecological process is this?
b) What are its initial and final stages?
c) What are the the terms that you would like to associate with the diagram along with the meaning.

2 Pick the correct option:

1. The community from after a succession is…..(a)
Complex (b ) Climax ( c) Both a and b ( c) Control

2. The species come first in succession is……. (a)
Pioneer (b) Secondary ( c) Tertiary (d ) either a or b

3.The succession takeing place on rock is known as…..
(a) Hydrach (b) Xerach ( c) Monarch (d ) None of the above

3 Match the following….

| A | B |
|---|---|
| 1. Lichen | 1. Inside water |
| 2. Submerged plants | 2. On rock |
| 3. Free Floating | 3. Upper layer of water |
| 4. Rooted plants | 4. On base of water body |
| 5. Land plant | 5. On land |

4

Fill in the blanks….

1. The gradual and fairly predictable change in the species composition of a given area is called……
2. The sequence takeing place during succession is known as ……..
3. Succession is a process thst starts where no ……. Organisms are found.
4. The species that invade a bare area called ……species.

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Give reasons ……..

(a) Speed of primary succession is slower than secondary succession.

(b) Environment of community is controlled by climax.

| Work Sheet: 15-A | Chapter No. 15 | Topic: Diversity at all levels of biological organisation | Region-Silchar |
|---|---|---|---|
| 1 | 1.A study of latitudinal gradient of biodiversity of birds is as follows:<br>India- 8 ° North—1200 Species<br>Greenland-71° North-55 Species<br>By analyzing the above data what does it indicate about the distribution of birds. | | |
| 2 | 1.What favours the genetic variation shown by the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges ? | | |
| 3 | 1.Why is Ecological diversity seen more in India as compared to Scandinavian country Norway. | | |
| 4 | Match the following:<br>1.IUCN(2004) total number of plant animal species discovered so far ----7 million<br>2.Robert May estimate of global species diversity-----.5 million<br>3.70 % of all recorded are-----.1 %<br>4. Among animals the most rich species are----plants (algae, fungi, bryophytes, gymnosperm and angiosperms).<br>5.India has only 2.4 % of land area, its share of global species diversity is---- insects | | |
| 5 | 1.Why are biologist not able to give the estimate of Prokaryotes in nature ? | | |

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**ANSWERS**

1 Species diversity decreases from equator towards the poles.

2 Genetic variation shown due to the potency and concentration of active chemical (reserpine) produced by the plant.

3 As India is rich in various ecosystem level with deserts ,rain forest,mangroves,coral reef,wetlands,estuaries and alpine meadows so greater ecosystem diversity.

4 Match the following:

1.IUCN(2004) total number of plant animal species described so far---- 1.5million

2.Robert May estimate of global species diversity----- 7 million

3.70 % of all recorded are- ----plants(algae,fungi,bryophytes,gymnospers and angiosperms)

4.Among animals the most rich species are—---- insects

5.India has only 2.4 % of land area, its share of global species diversity is---- 8.1 %

5 Because the the conventional taxonomic methods are not suitable for identifying microbial species .

| Work Sheet: 15B | Chapter No. 15 | Topic: Diversity at all levels of biological organisation | Region - Silchar |
|---|---|---|---|

1 A study of latitudinal gradient of biodiversity of birds is as follows:

India- 8 $^{o}$ North—1200 Species

Greenland-71$^{o}$ North-55 Species

By analyzing the above data what does it indicate about the distribution of birds.

2 What favours the genetic variation shown by the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges ?

3 Why is Ecological diversity seen more in India as compared to Scandinavian country Norway.

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5.India has only 2.4 % of land area, its share of global species diversity is---- insects

5 Why are biologist not able to give the estimate of Prokaryotes in nature ?

**ANSWERS**

1 Species diversity decreases from equator towards the poles.

2 Genetic variation shown due to the potency and concentration of active chemical (reserpine) produced by the plant.

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3.70 % of all recorded are- ----plants(algae,fungi,bryophytes,gymnospers and angiosperms)

4.Among animals the most rich species are—---- insects

5.India has only 2.4 % of land area, its share of global species diversity is---- 8.1 %

5 Because the the conventional taxonomic methods are not suitable for identifying microbial species .

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 15-C | No. 15 | **Pattern of Biodiversity** | Silchar Region |

1 Answer in one word or one sentence

a) Why species diversity is more in India than in Greenland?

b) The scientist has found that the slope of line of regression is found to be more than 0.2. In which condition this will be possible?

2 Fill in the blank

a) The shape of graph in species area richness relationship in bats is ----------.

b) Niche specialization thereby leading to greater species diversity in tropic is due to----------.

c) Frequent glaciations in temperate region leads to less----------.

d) Species richness is related with---------- up to a certain limit.

3 Match the followings

| | |
|---|---|
| 1. Environment in temperate region. | a) Steeper slope of line |
| 2. More solar energy. | b) More constant and more predictable. |
| 3. Tropical latitudes | c) Leads to more species diversity. |
| 4. Constant environment | d) More species diversification. |
| 5. High regression coefficient | e) More biodiversity. |

4 Choose the correct answer

1) The slope of line in species area relationship graph is 1.15

a) Angiosperm plants b) mammals c) birds d) fresh water fishes

b) Scientists have estimated that about two million insects species are yet to be discovered in

a) Greenland b) Equador c) Amazonian Rain forest d) India

c) As we move from 41$^{o}$N to 71$^{o}$N, the species diversity

a) Increases b) Decreases c) Remain the same d) Doubled

d) Frequent glaciations leads to

a) Increase species diversification b) High productivity c) Decrease species diversification d) Niche specialization

5 The following graph depicts the species-area relationship. Answer the following questions

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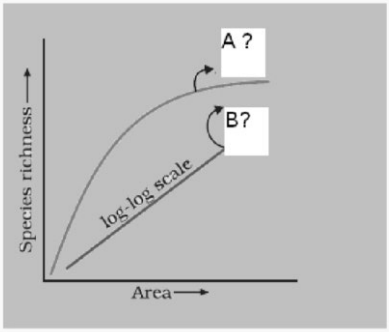
**Work Sheet- Bright Learners**




1) Give the equation of "A" and equation of 'B".
2) What does steeper slope in curve "B" represents?
3) Who studied the species – area relationship in South African jungles?
4) What does Z stands for? In which range does the normal value of Z lies?

**ANSWERS**

1 Biodiversity decreases from equator to pole; When large areas like whole continent are taken for analysis.

2 Rectangular hyperbola; More constant and predictable environment; Species diversification; area 3 1-b; 2-c; 3-e; 4-d; 5- a

4 b; c ; b; c

5 $S= CA^Z$ ; log S= log C + Z log A ; Higher regression coefficient; regression coefficient, 0.1 to 0.2

| Work Sheet: 15D | Chapter No. 16 | Topic: domestic sewage and industrial effluents | sieuli baidya Region -silchar |
|---|---|---|---|

1 Write scientific name of water hyacinth? why it is known as "terror of Bengal"?

2 Introduction of which nutrient in water bodies result eutrophication?

3 Give reasons why there is a continuous increase in the DDT content in different trophic levels of the chain?

4 What percentage of global warming is contributed by each of the following?

i)Carbon di oxide
ii)chlorofluorocarbons
iii)nitrous oxide and
iv) methane

5 Ornithologists observed a decline in the bird population I the area near a lake after the setting of an industrial unit in the same area. explain the cause responsible for the decline observed?

**ANSWERS**

1 *Eichhornia crassipes*. It results in eutrophication

2 Nitrogen and phosphorus

3 This happens because a toxic substance accumulated by an organism cannot be metabolized or excreted,and is thus passed on to the next higher trophical level.

4 i)60%, ii) 14%, iii)6%, iv) 20%

5 High concentration of DDT interferes with calcium metabolism in birds and cause thinning of egg shells and their premature breaking,this eventually leads to a decline in bird population.

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| Work Sheet: 16-A | Chapter No. 16 | Topic: Domestic sewage and industrial effluents |
|---|---|---|

1

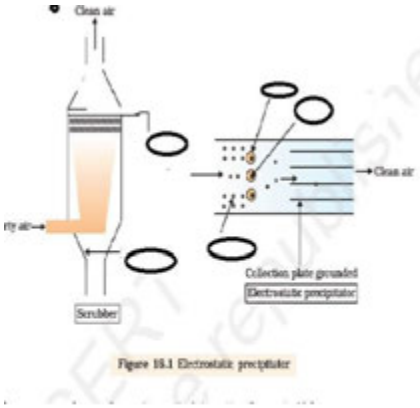


Figure 16.1 Electrostatic precipitator

Fill the gap in the above given diagram.

2 Introduction of which nutrient in water bodies result eutrophication? Choose the correct answer.

1. Nitrogen and phosphorus
2. Calcium and phosphorus
3. Calcium and nitrogen
4. Iron and calcium

3 Give reasons why there is a continuous increase in the DDT content in different trophic levels of the chain?

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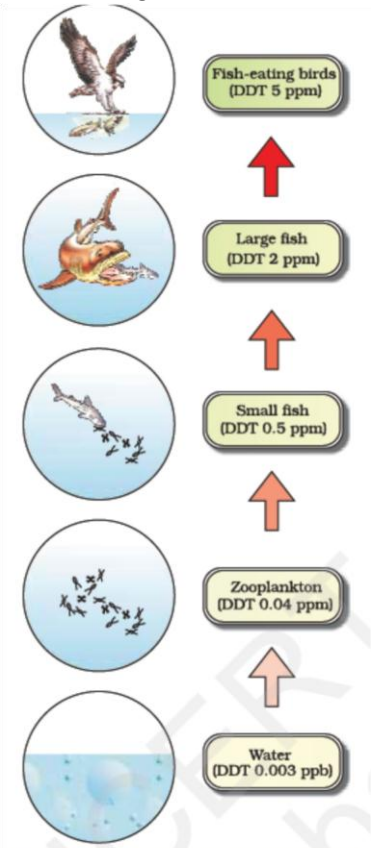



**Figure 16.5** Biomagnification of DDT in an aquatic food chain

4 What percentage of global warming is contributed by each of the following?

i)Carbon di oxide
ii)chlorofluorocarbons
iii)nitrous oxide and
iv) methane

5

Ornithologists observed a decline in the bird population I the area near a lake after the setting of an industrial unit in the same area. explain the cause responsible for the decline observed?

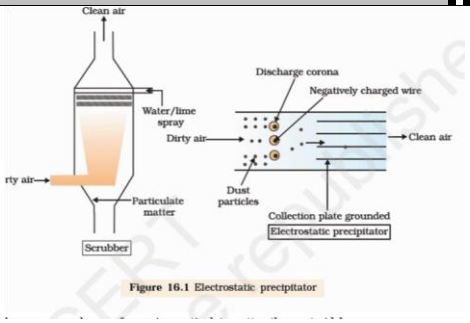
| | ANSWERS |
|---|---|
| 1 |  |
| 2 | Nitrogen and phosphorus |
| 3 | This happens because a toxic substance accumulated by an organism cannot be metabolized or excreted,and is thus passed on to the next higher trophical level. |



Figure 16.1 Electrostatic precipitator

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| | |
|---|---|
| 4 | i)60%, ii) 14%, iii)6%, iv) 20% |
| 5 | High concentration of DDT interferes with calcium metabolism in birds and cause thinning of egg shells and their premature breaking,this eventually leads to a decline in bird population. |

| Work Sheet: | Chapter | Topic: | Prepared by: |
|---|---|---|---|
| 16B | No. 16 | ENVIRONMENTAL ISSUES | SILCHAR Region |

1

Match correctly the following and choose the correct option

| | |
|---|---|
| i. Environment Protection Act | A. 1974 |
| ii. Air Prevention & Control of Pollution Act | B. 1987 |
| iii. W ater Act | C. 1986 |
| iv. Amendment of Air Act to include noise | D. 1981 |

The correct matches is;

a. i-C, ii-D, iii-A, iv-B b. i-A, ii-C, iii-B, iv-D

c. i-D, ii-A, iii-B, iv-C d. I-C, ii-D, iii-B, iv-A

2 In the textbook you came across Three Mile Island and Chernobyl disasters associated with accidental leakage of radioactive wastes. In India we had Bhopal gas tragedy. It is associated with which of the following?

a. $CO_2$ b. Methyl Iso-Cyanate

c. CFC's d. Methyl Cyanate

3 Blends of polyblend and bitumen, when used, help to increase road life by a three times. What is the reason?

4 Why has the National Forest Commission of India recommended a relatively larger forest cover for hills than for plains?

5 Name the Industry which causes air, soil and water pollution.

**ANSWERS**

1 A

2 B

3 Water resistant; non biodegradable; long lasting 4 Control soil erosion and land sliding 5 Fertilizer Industry.

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## Guidelines :

1 The proforma will be used by the individual student. One sheet for one student

2 After each test, be it a monthly test or Unit Test or HY or Pre Board or any other test conducted, the teacher will corelate the question number with the chapters. The Teacher will total the marks alloted from each chapters.

3 After receiving the evaluated answerscripts, each student will calculate the total marks obtained in different chapters asked in the QP.

4 The student will then calculate the percentage of marks obtained in that chapter (marks obtained /total marks alloted from this chapter)X100

5 The student will enter the mar in % in the cell (box) against the Month and Chapter No. and continue doing throughout the year.

6 Throughout the year on different occassions (tests) say questions from Chapter 3 may be asked. So every time (in different months) when the questions from Chapter 3 is asked, the teacher must tell the students / or student will identify the questions which belongs to chapter 3. Then total marks from chapter 3. then how much marks obtained from chapter 3 questions. then the % marks obtained in chapter 3 and finally enter into the sheet. Use UP arrows and DOWN arrows to indicate increase in mark % on different tests

7 (months) in every column wich indicated whether the mark in increasing or decreasing in subsequent months.

| | **Chp 3** | **Chp4** |
|---|---|---|
| **April** | 35 | No Test |
| **July** | ⬆ 65 | 45 |
| **Oct** | ⬇ 55 | ⬆ 60 |
| **Nov** | ⬆ 80 | ⬆ 80 |

## Advantage:

The student will realise his / her performance on different occassions (tests)

1 conducted throughout the year for every chapter

2 The student will realise which chapters need more attention

3 The student will be able to manage time and reduce wasting time The student will be able to identify his / her chapters in which he / she is

4 strong, or Weak or threatning

5

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