YAKEEN NEET 2.0

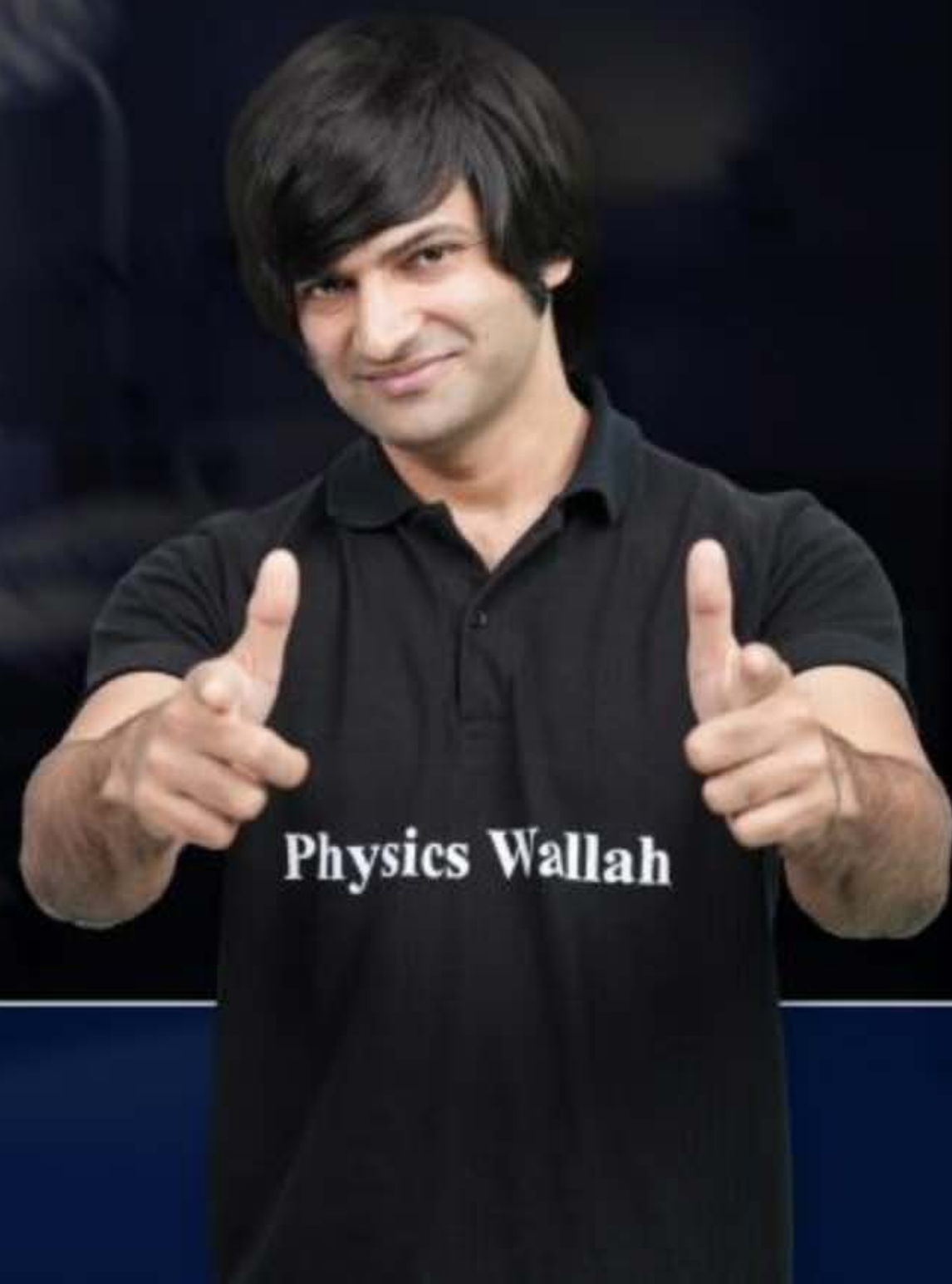## 2026

Biological Classification

| Botany | Lecture – 01 |

Rupesh Chaudhary Sir

Topics to be covered

1. Today you will get 80 QUESTIONS IN TEST
   - CELL: UNIT OF LIFE
   - CELL CYCLE
   - LIVING WORLD.

2. Classification

3. 3 बजे तक class है

4.

CELL CYCLE &
CELL DIVISION
(100 QUESTION PYQ)
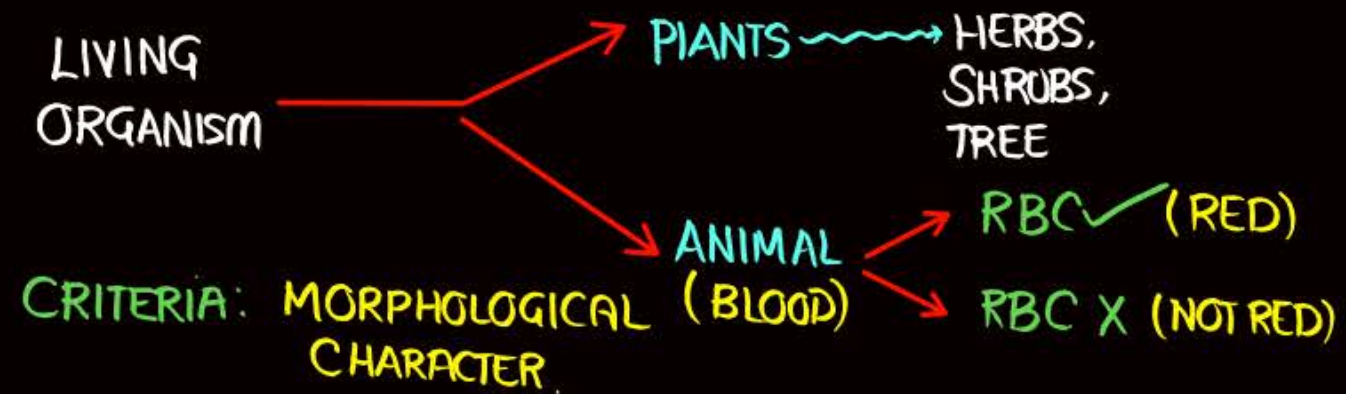→ THIS WEEK (MY WORDS)
→ SUNDAY

NCERT
READ
(LIVING WORLD)

CLASSIFICATION

★ EARLIEST : NO SCIENTFIC APPROACH , USE OF ORGANISM
NEED FOOD, CLOTHES, SHELTER
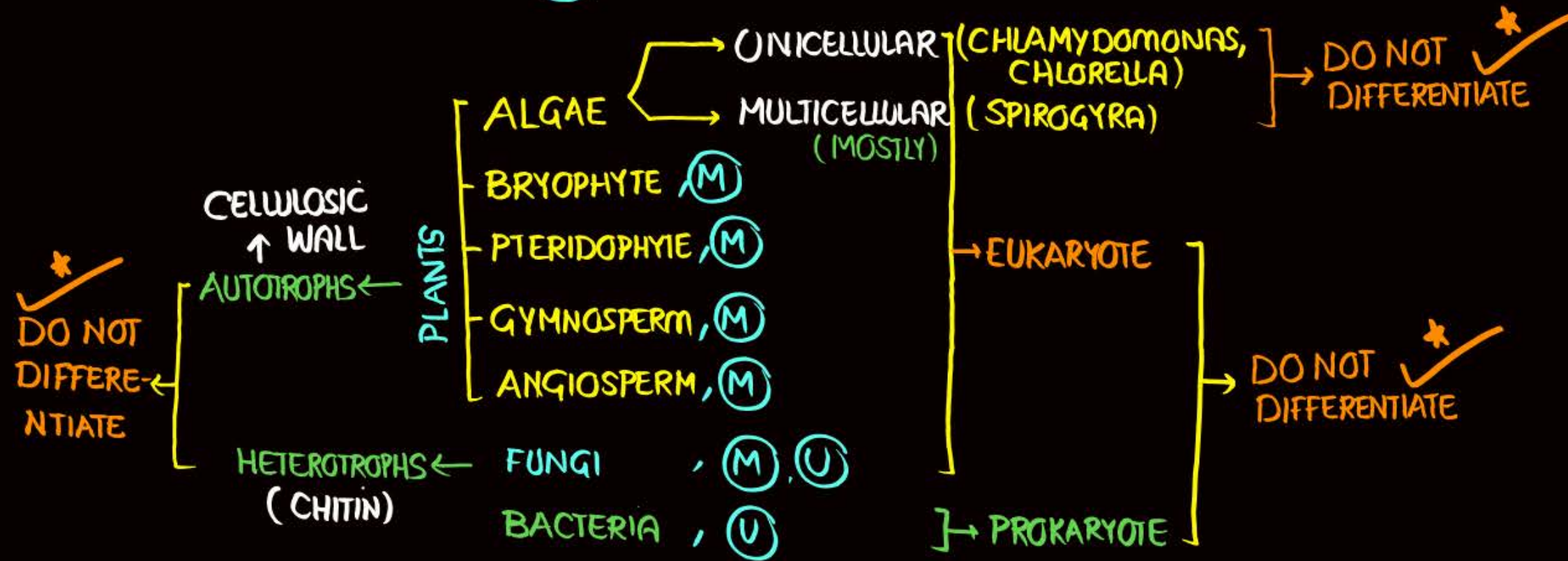
★ 1st TIME : SCIENTIFIC APPROACH : ARISTOTLE

LIVING
ORGANISM → PLANTS ～～→ HERBS,
SHRUBS,
TREE

→ ANIMAL → RBC ✓ (RED)
(BLOOD) → RBC X (NOT RED)

CRITERIA : MORPHOLOGICAL
CHARACTER .

2K: LINNAEUS: CRITERIA: PRESENSE/ABSENSE OF CELLWALL. (CW)

① PLANTAE CW ✓

② ANIMALIA CW X

① PLANTAE

ALGAE → UNICELLULAR (CHLAMYDOMONAS, CHLORELLA) } DO NOT DIFFERENTIATE ✓ ⭐
→ MULTICELLULAR (SPIROGYRA)
(MOSTLY)

CELLULOSIC ↑ WALL

AUTOTROPHS ←

PLANTS:
- BRYOPHYTE Ⓜ
- PTERIDOPHYTE, Ⓜ
- GYMNOSPERM, Ⓜ
- ANGIOSPERM, Ⓜ

→ EUKARYOTE ┐
│ } DO NOT DIFFERENTIATE ✓ ⭐

DO NOT DIFFERENTIATE ✓ ⭐

HETEROTROPHS ← FUNGI , Ⓜ, Ⓤ
(CHITIN)

BACTERIA , Ⓤ

┘→ PROKARYOTE ┘

Ⓤ: UNICELLULAR
Ⓜ: MULTICELLULAR

② ANIMALIA

VERTEBRATES

INVERTEBRATES

PROTOZOA (AMOEBA, PARAMECIUM)

NOTE: EUGLENA ⭐ ✓

CW X (ANIMAL) ⟍ ⟋ PHOTOSYNTHESIS (PLANT)

CHARACTER

⭐ DO NOT FIT INTO ANY CATEGORY.

⭐ INADEQUATE (NOT SUFFICENT)

⭐ NEED TO REALISE : INCREASE CRITERIA
(CELL STRUCTURE, NUTRITION, REPRODUCTION, CELL WALL COMPOSITION, HABITAT, PHYLOGENY)

* PLANTAE
* ANIMALIA
* PROTISTA : UNICELLULAR EUKARYOTES

PLANTAE   ANIMALIA
CW ✓   EARLIER   CW ✗

CHLORELLA,   & AMOEBA
CHLAMYDOMONAS.   PARAMECIUM
(PROTOZOA)

TOGETHER

4K : COPELAND

* PLANTAE
* ANIMALIA
* PROTISTA
* MONERA → PROKARYOTES (BACTERIA, BLUEGREEN ALGAE)
                    → MOSTLY HETEROTROPHS.
                      SOME AUTOTROPHS

3K&
5K. ⭐

NOTE   2K → 3K → 4K

PLANTAE ⎤→ FIXED
ANIMALIA ⎦
BUT ORGANISMS WERE
CHANGING .

5K: R.H WHITTAKER (1969).

6K: CARL WOESE

MONERA ——— DIVIDED INTO TWO KINGDOM ——→ EUBACTERIA ⟞⟶ BACTERIA

PROTISTA ———————————————————————→ ARCHAEBACTERIA ⟞⟶ ARCHAEA

FUNGI

PLANTAE

ANIMALIA

PROTISTA

FUNGI

PLANTAE ——→ EUKARYA

ANIMALIA

3 DOMAINS

CRITERIA

★ CELL STRUCTURE < PROK / EUKA.

★ BODY ORGANISATION < UNICE / MULTI

★ NUTRITION < AUTO / HETROTROPHS.

★ REPRODUCTION < ASEXUAL / SEXUAL.

★ PHYLOGENY

TABLE 2.1 Characteristics of the Five Kingdoms

Characters	Five Kingdoms				
	Monera	**Protista**	**Fungi**	**Plantae**	**Animalia**
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present with chitin	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multiceullar/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosyn-thetic and photosynthetic) and Hetero-trophic (sapro-phytic/para-sitic)	Autotrophic (Photosyn-thetic) and Hetero-trophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosyn-thetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

Handwritten annotations:
- PEPTIDOGLYCAN (pointing to Monera cell wall)
- NOT A CRITERIA (pointing to Cell wall and Nuclear membrane)
- PROTOZOA (PROTISTA) → CELL WALL ABSENT
- CELLS ARE LOOSELY ARRANGE (pointing to Fungi body organisation)
- UNIC (under Monera Cellular)
- UNIC (under Protista Cellular)
- (ROOT, STEM ETC) (under Plantae Tissue/organ)
- CHEMICAL ENERGY (pointing to chemosynthetic)
- LIGHT ENERGY (pointing to photosynthetic)
- FEED ON DEAD PLANT & ANIMAL
- NOT CHEMOSYNTHETIC
- 1st ingestion 2nd digestion (pointing to Holozoic)

Since the dawn of civilisation, there have been many attempts to classify living organisms. It was done instinctively not using criteria that were scientific but borne out of a need to use organisms for our own use – for food, shelter and clothing. Aristotle was the earliest to attempt a more scientific basis for classification. He used simple morphological characters to classify plants into trees, shrubs and herbs. He also divided animals into two groups, those which had red blood and those that did not.

In Linnaeus' time a **Two Kingdom** system of classification with **Plantae** and **Animalia** kingdoms was developed that included all plants and animals respectively. This system did not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and photosynthetic (green algae) and non-photosynthetic (fungi) organisms. Classification of organisms into plants and animals was easily done and was easy to understand, but, a large number of organisms did not fall into either category.

AUTO.   *HETRO.*

EUGLENA

Hence the two kingdom classification used for a long time was found inadequate. Besides, gross morphology a need was also felt for including other characteristics like cell structure, nature of wall, mode of nutrition, habitat, methods of reproduction, evolutionary relationships, etc. Classification systems for the living organisms have hence, undergone several changes over the time.

Though plant and animal kingdoms have been a constant under all different systems, the understanding of what groups/organisms be included under these kingdoms have been changing; the number and nature of other kingdoms have also been understood differently by different scientists over the time.

R.H. Whittaker (1969) proposed a **Five Kingdom Classification**. The kingdoms defined by him were named **Monera, Protista, Fungi, Plantae** and **Animalia.** The main criteria for classification used by him include cell structure, body organisation, mode of nutrition, reproduction and phylogenetic relationships. Table 2.1 gives a comparative account of different characteristics of the five kingdoms.

The three-domain system has also been proposed that divides the Kingdom Monera into two domains, leaving the remaining eukaryotic kingdoms in the third domain and thereby a six kingdom classification. You will learn about this system in detail in higher classes.
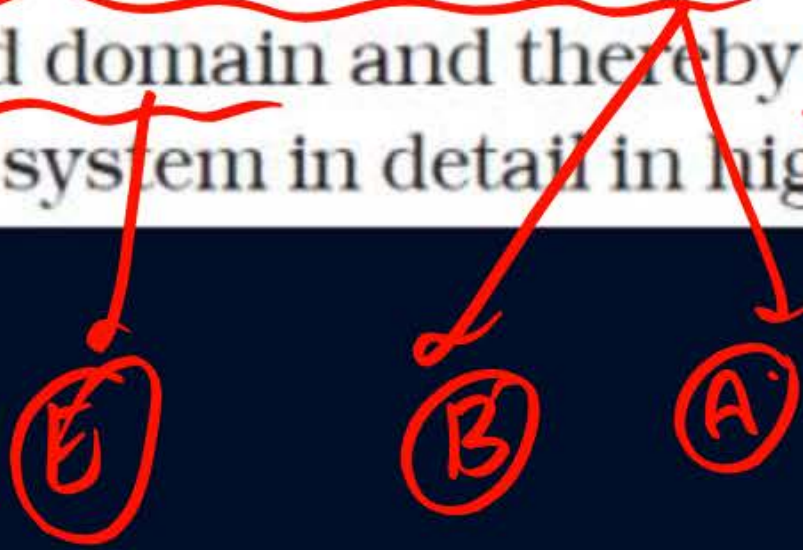
Let us look at this five kingdom classification to understand the issues and considerations that influenced the classification system. Earlier classification systems included bacteria, blue green algae, fungi, mosses, (BRYOPHYTE) ferns, gymnosperms and the angiosperms under 'Plants'. The character that unified this whole kingdom was that all the organisms included had a cell wall in their cells. This placed together groups which widely differed in other characteristics. It brought together the prokaryotic bacteria and the blue green algae (cyanobacteria) with other groups which were eukaryotic.

2K.

PTERIDOPHYTE

PLANTAE

It also grouped together the unicellular organisms and the multicellular ones, say, for example, *Chlamydomonas* and *Spirogyra* were placed together under algae. The classification did not differentiate between the heterotrophic group – fungi, and the autotrophic green plants, though they also showed a characteristic difference in their walls composition – the fungi had chitin in their walls while the green plants had a cellulosic cell wall. When such characteristics were considered, the fungi were placed in a separate kingdom – Kingdom Fungi.

. All prokaryotic organisms were grouped together under Kingdom Monera and the unicellular eukaryotic organisms were placed in Kingdom Protista. Kingdom Protista has brought together *Chlamydomonas, Chlorella* (earlier placed in Algae within Plants and both having cell walls) with *Paramoecium* and *Amoeba* (which were earlier placed in the animal kingdom which lack cell wall).

2K.

It has put together organisms which, in earlier classifications, were placed in different kingdoms. This happened because the criteria for classification changed. This kind of changes will take place in future too depending on the improvement in our understanding of characteristics and evolutionary relationships. Over time, an attempt has been made to evolve a classification system which reflects not only the morphological, physiological and reproductive similarities, but is also phylogenetic, i.e., is based on evolutionary relationships.

In this chapter we will study characteristics of Kingdoms Monera, Protista and Fungi of the Whittaker system of classification. The Kingdoms Plantae and Animalia, commonly referred to as plant and animal kingdoms, respectively, will be dealt separately in chapters 3 and 4.

Incorrect	Linnaeus (Correct)
C (A) Many attempt done to classify organism	A. Two kingdom classification (Plantae and animalia) ✓
C (B) they are not using scientific criteria earlier	B. distinguish between prokaryote and eukaryote ✗
C (C) criteria was like use of organism (food shelter etc.)	C. didn't distinguish between autotrophs and heterotrophs ✓
(D) Linnaeus was first to attempt scientific basis for classification ✓	D. distinguish unicellular & multicellular organism ✗
	E. not distinguish between green plants & fungi (autotrophs) ✗

Incorrect

(A) Aristotle first time scientific approach

(B) divided living organism into plants and animals

(C) classify plants into herb, shrubs, tree

(D) use reproductive criteria ✓

F. Large number of organism didn't fall in any of two category ✓

Options

(A) 2

(B) 3

(C) 4

(D) 5

Incorrect

(A) two kingdom was found inadequate C

(B) need to realise to include others character also other than morphology C

(C) cell structure, cell wall composition, nutrition, habitat etc. C

(D) classification ~~didn't~~ undergoes any changers over the time ✓

Incorrect   2K, 3K, 4K, 5K, 6K.

(A) Plants and animal kingdom constant in all classification

(B) organisms under these kingdoms were changing

(C) R.H Whittaker proposed (~~1969~~) five kingdom classification

(D) main criteria was cell structure, body organisation, nutrition, reproduction, ~~not~~ phylogeny

(E) Both D & C are incorrect ✓

~~Correct~~ INCORRECT

(A) three domain : ~~E~~ubacteria, Archaea, Eukarya ✓

(B) Monera divided into two domains ✓

(C) earlier system includes bacteria, BGA, fungi, mosses, ferns, gymnosperm, angiosperm under plants ✓

(D) all are correct

Incorrect

(A) Two kingdom brought together bacteria, BGA, with other groups which were eukaryotic

(B) chlamydomonas (unicellular) & spirogyra (Multicellular) placed ~~separately~~ in two kingdom classification   TOGETHER

(C) fungi and green plants show different cell wall composition even placed ~~separately~~ as per 2 Kingdome Classification   TOGETHER

(D) both B and C are incorrect

Correct

(A) All unicellular eukaryotes placed in plantae _PRO_

(B) all prokaryote placed in protists _M_

(C) kingdom protists brought together amoeba, paramecium and chlorella chlamydomonas

(D) amoeba earlier placed in planatae kingdom _A_

(E) chlorella earlier placed in animalia kingdom _P_

QUESTION

FROM MODULE

TOPIC : CLASSIF^N