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| SCHEME OF WORK BIOLOGY FORM FOUR TERM ONE  |
| *W**NO* | L/**NO** | TOPIC/*SUBTOPIC* | *LESSON / SPECIFIC**OBJECTIVES* | *TEACHING / LEARNING**ACTIVITIES* | *MATERIALS* */**RESOURCES* | REF. | REMARKS |
| 1 | 1 | GENETICSThe concept of variation. | *By the end of the lesson, the learner should be able to:* Define Genetics.Define variation. | Exposition of new concepts.Probing questions on some variations in human beings.Observe some variations in human beings such as tongue rolling, finger prints, students’ heights, etc.Discussion on the concept of variation. | *Ink pad, hand lenses, white paper.*  | KLB BK IV.*PP 1*-2.  |  |
| 2-3 | Discontinuous variation. | Define discontinuous variation. | Observe some discontinuous variations in human beings such as tongue rolling, sex, blood groups, etc.Discussion on the concept of discontinuous variation. |  | KLB BK IV.*P 3.* |  |
| 4,5 | Continuous variation. | Define continuous variation.Give examples of characteristics that show continuous variation. | Class activity ; students measure and record their heights;Plotting of frequency-height graph;Analyzing the graph;Discussion with probing questions. | *Metre rules/ tape measure,**Graph papers* | KLB BK IV.*PP 3-4* |  |
| 2 | 1-2 | Causes of variation. | Discuss causes of variation. | Exposition of new concepts.Discussion with probing questions. |  | KLB BK IV. *P 4* |   |
| 2 | 3-4 | The chromosome. | Describe the structure of chromosomes. | Exposition of new concepts.Probing questions.Discussion. |  | KLB BK IV. *PP 4-5.* |  |
| 5 | Chromosomal behaviour during mitosis. | Describe chromosomal behaviour during mitosis. | Exposition;Teacher demonstrations;Drawing diagrams;Detailed discussion. | *Scissors,**Manilla papers, thread, cellotape.* | KLB BK IV. *PP 5-6* |  |
| 3 | 1-2 | Chromosomal behaviour during meiosis. | Describe chromosomal behaviour during meiosis. | Exposition;Teacher demonstrations;Drawing diagrams;Detailed discussion. | *Scissors,**Manilla papers, threads, cellotape.* | KLB BK IV. *PP 6-7* |  |
| 3-4 | Genes and DNA. | Describe the structure of genes and DNA.Identify the role of DNA. | Expository approach. | *Chart- the double helix DNA.* | KLB BK IV. *PP 7-8* |  |
| 5 | DNA replication. | Describe DNA replication.Explain the role of DNA in protein synthesis. | Exposition;Drawing mRNA strands. |  | KLB BK IV. PP 9-10 |  |
| 4 | 1 | First law of heredity. | Describe Mendel’s experiments.State Mendel’s first law. | Exposition with explanations. |  | KLB BK IV. *PP 11-12* |  |
| 2-3 | Monohybrid inheritance. | Define monohybrid inheritance.Differentiate between genotype and phenotype.Draw diagrams to show genetic crosses. | Q/A to review Mendel’s first law.Drawing diagrams to show genetic crosses.Discussion with probing questions. |  | KLB BK IV. *PP 12-14* |  |
| 4-5 | Genetic crosses using a punnet square. | Show fusion of gametes using a punnet square. | Completing a punnet square;Brief discussion. |  | KLB BK IV. *PP 14-15* |  |
| 5 | 1-2 | Ratios of phenotypes and genotypes. | Explain the concept of probability in inheritance of characteristics. | Q/A to review phenotypes and genotypes.Simple experiments on probability.Discussion. | *Beans of two different colours, beakers.* | KLB BK IV. *PP 15-17* |  |
| 3-4 | Incomplete dominance. | Cite examples of incomplete dominance.Illustrate incomplete dominance with diagrams. | Exposition;Discussion;Drawing diagrams. |  | KLB BK IV. *PP 19-20.* |  |
| 5 | Inheritance of ABO blood groups. | Identify the four blood groups and their genotypes.Illustrate inheritance of blood groups with diagrams. | Exposition;Discussion;Drawing diagrams;Supervised practice on inheritance of blood groups. |  | KLB BK IV. *PP 20-21* |  |
| 6 | 1 | Inheritance of ABO blood groups. | Illustrate inheritance of blood groups with diagrams. | Exposition;Discussion;Drawing diagrams;Supervised practice on inheritance of blood groups. |  | KLB BK IV. *PP 20-21* |  |
| 2 | Inheritance of Rhesus factor. | Describe inheritance of Rhesus factor. | Exposition;Discussion. |  | KLB BK IV. *PP 21-22* |  |
| 3-4 | Determining unknown genotypes. | Determine unknown genotypes using test crosses and selfing crosses. | Exposition;Probing questions;Drawing illustrative diagrams;Discussion. |  | KLB BK IV. *PP 22-23* |  |
| 5 | Sex determination in man. | Describe sex determination in man. | Exposition;Drawing illustrative diagrams;Discussion. |  | KLB BK IV. *PP 23-24* |  |
| 7 | 1-2 | Sex-linked genes and traits. | Identify sex-linked traits in man.Illustrate inheritance of sex-linked traits with diagrams. | Probing questions;Drawing illustrative diagrams;Discussion. |  | KLB BK IV. *PP 24-27* |  |
| 3-4 | Non-disjunction. | Explain effects of non-disjunction as a chromosomal abnormality. | Exposition of new concepts;Discussion. |  | KLB BK IV. *PP 30-33* |  |
| 5-1 | TEST & MID – TERM BREAK |  |  |  |  |
| 8 |
| 2-3 | Gene mutation. | Differentiate between chromosomal and gene mutation.Identify types of gene mutation. | Q/A to review types of chromosomal mutation;Using sequence models to show chromosomal mutations.Discussion. | *Models to show Chromosomal mutations.* | KLB BK IV. *PP 33-35* |  |
| 4-5 | Disorders due to gene mutations. | Explain some disorders due to gene mutations.Illustrate genetic disorders with diagrams. | Discussion on albinism, sickle-cell anaemia, haemophilia, colour blindness.Drawing illustrative diagrams. |  | KLB BK IV. *PP 35-38* |  |
| 9 | 1-2 | Disorders due to gene mutations. | Illustrate genetic disorders with diagrams. | Discussion on albinism, sickle-cell anaemia, haemophilia, colour blindness.Drawing illustrative diagrams. |  | KLB BK IV. *PP 35-38* |  |
| 3-4 | Applications of genetics. | Identify areas of practical application of genetics. | Probing questions;Open discussion;Topic review. |  | KLB BK IV. *PP 39-45* |  |
| 5 | EVOLUTIONMeaning of evolution.Theories of origin of life. | Define evolution.Explain the theories of life. | Brain storming;Probing questions;Q/A on creation theory;Exposition of chemical theory. |  | KLB BK IV. *PP 49-51* |  |
| 10 | 1-2 | Evidence for organic evolution. | Cite evidence for organic evolution. | Brain storming;Probing questions;Exposition;Discussion. |  | KLB BK IV. *PP 51-59* |  |
| 3-4 | Comparative anatomy and homologous structures. | Define divergent evolution.Give examples of homologous structures. | Examine forelimbs of vertebrates;Discuss adaptations and use of the limbs. | *Forelimbs of vertebrates.* | KLB BK IV. *PP 59-63* |  |
| 5 | Comparative anatomy and homologous structures. (contd) | Define divergent evolution.Give examples of homologous structures. | Examine forelimbs of vertebrates;Discuss adaptations and use of the limbs. | *Forelimbs of vertebrates.* | KLB BK IV. *PP 59-63* |  |
| 11 | 1 | Convergent evolution and analogous structures. | Define convergent evolution.Give examples of analogous structures.Give examples of vestigial structures. | Examine wings of insects; wings of birds / bat.Discuss observations. | *Wings of insects, wings of birds / bat.* | KLB BK IV. *PP 63-64* |  |
| 2-3 | Convergent evolution and analogous structures.(contd) | Define convergent evolution.Give examples of analogous structures.Give examples of vestigial structures. | Examine wings of insects; wings of birds / bat.Discuss observations. | *Wings of insects, wings of birds / bat.* | KLB BK IV. *PP 63-64* |  |
| 4 | Larmack’s theory of evolution. | Explain Larmack’s theory of evolution. | Expositions and explanations. |  | KLB BK IV. *P 67* |  |
| 5 | Darwin’s theory of natural selection. | Explain Darwin’s theory of natural selection.Cite examples of natural selection in action. | Expositions and explanations;Probing questions;Topic review. |  | KLB BK IV. *PP 67-72* |  |
| 1213 |  | END OF TERM ONE EXAMS  |  |
| SCHEME OF WORK BIOLOGY FORM FOUR TERM TWO |
| *W**NO* | L/**NO** | TOPIC/*SUBTOPIC* | *LESSON / SPECIFIC**OBJECTIVES* | *TEACHING / LEARNING**ACTIVITIES* | *MATERIALS* */**RESOURCES* | REF. | REMARKS |
| 1 | 1-2 | RECEPTION, RESPONSE & CO-ORDINATIONMeaning of stimulus, response and irritability.Tactic responses. | Define of stimulus, response and irritability.Explain the need for sensitivity and response.Identify types of tactics responses. | Brain storming;Exposition;Group experiments-chemotaxis in termites;Discussion. | *Brad crumbs, termites, dry sand, moth balls.* | KLB BK IV. *PP 73-74* |  |
| 3-4 | Tropism and types of tropism. | Identify types of tropism.State differences between tropisms and taxes. | Examine previous plant set –ups on response to light, gravity;Probing questions and discussion. | *Seedlings, klinostat, corked beaker.* | KLB BK IV. *PP 74-78* |  |
| 5 | Nastic responses. | Identify types of nastic responses | Q/A and discussion. |  | KLB BK IV. *PP 78-80* |  |
| 2 | 1-3 | Role of auxins in tropisms. | Explain the role of auxins in tropisms. | Examine previous plant set –ups on response to light, gravity; contact;Probing questions and discussion. |  | KLB BK IV. *PP 80-83* |  |
| 4-5 | Response and Co-ordination in animals.The nervous system. | State components of the nervous system.Describe the structure of nerve cells. | Descriptive and expository approaches. | *Illustrative diagrams.* | KLB BK IV. *PP 84-85* |  |
| 3 | 1 | Types of neurons.The brain. | Identify types of neurons.Describe structure of the human brain. | Descriptive and expository approaches. | *Illustrative diagrams.* | KLB BK IV. *PP 85-88* |  |
| 2 | Reflex actions. | Differentiate between simple and conditioned reflex actions. | Illustrate a simple reflex arc.Probing questions on differences between simple and conditioned reflex actions. | *Illustrative diagrams.* | KLB BK IV. *PP 88-90* |  |
| 3,4 | Transmission of a nerve impulse. | Describe the transmission of a nerve impulse. | Descriptive and expository approaches. | *Illustrative diagrams.* | KLB BK IV. *PP 90-93* |  |
| 5 | The endocrine system. | Identify components of endocrine system.Compare endocrine system. With nervous system. | Discussion; tabulate the differences. | *Illustrative diagrams.* | KLB BK IV. *PP 93-6* |  |
| 4 | 1-2 | The mammalian eye. | Identify major parts of the human eye.Explain image formation and interpretation in the eye. | Brain storming;Discussion with probing questions. | *Chart- the human eye.* | KLB BK IV. *PP 93-100* |  |
| 3-4 | Accommodation of the eye. | Explain the role of ciliary muscles in accommodation of the eye. | Discussion with probing questions,Drawing illustrative diagrams. | *Chart- focusing far and near points.* | KLB BK IV. *PP 100-1* |  |
| 5 | Defects of vision and their correction. | Identify defects of vision.Explain correction of vision defects. | Detailed discussion with probing questions;Drawing illustrative diagrams. | *Illustrative diagrams.* | KLB BK IV. *PP 101-4* |  |
| 5 | 1 | Defects of vision and their correction. | Identify defects of vision.Explain correction of vision defects. | Detailed discussion with probing questions;Drawing illustrative diagrams. | *Illustrative diagrams.* | KLB BK IV. *PP 101-4* |  |
| 2 | The human ear. | Identify major parts of the human ear. | Descriptive and expository approaches.Drawn diagrams. | *Illustrative diagrams.* | KLB BK IV. *PP 104-5* |  |
| 3 | Hearing. | Explain how the ear perceives sound. | Descriptive and expository approaches. |  | KLB BK IV. *P 106* |  |
| 4 | Body balance and posture. | Explain how the ear maintains body balance and posture. | Descriptive and expository approaches. |  | KLB BK IV. *PP 107-8* |  |
| 5 | Defects of the ear. | Identify some defects of the ear. | Descriptive and expository approaches. |  | KLB BK IV. P 108 |  |
| 6 | 1 | SUPPORT & MOVEMENT IN PLANTS AND ANIMALSImportance of support and movement in plants. | Explain the importance of support and movement in plants. | Brain storming;Probing questions;Discussion. |  | KLB BK IV. *PP 111-2* |  |
| 2 | Arrangement of tissues in a monocotyledonous stem. | Draw and label a transverse section of a monocotyledonous stem.  | Examine transverse section of a monocotyledonous stem. | Monocotyledo-nous stem, eg. tradescantia, microscope,Razors. | KLB BK IV. *PP111-2.* |  |
| 6 | 3,4 | Arrangement of tissues in a dicotyledonous stem. | Draw and label a transverse section of a dicotyledonous stem. Draw and label a transverse section of herbaceous and woody stems. | Examine transverse section of a dicotyledonous stem, herbaceous and woody stems.  | Herbaceous stem, microscope, slides,Razors. | KLB BK IV. *PP 111-5* |  |
| 5 | Stem tissues. | Identify some stem tissues.Explain the role of stem tissues. | Drawing and labeling diagrams;Discussion. | *Illustrative diagrams.* | KLB BK IV. *PP 113-5* |  |
| 7 | 1 | Wilting in plants. | Compare the rate of wilting of herbaceous and woody stems. Account for difference in rate of water loss.  | Uproot herbaceous and woody plants;Observe tem for about 30 min;Brief discussion. |  | KLB BK IV. *P 116* |  |
| 2-3 | The exoskeleton. | Describe the structure of the exoskeleton. | Examine movement of a live arthropod;Observe muscles of the hind limb of a grasshopper;Relate the observations to the function of the exoskeleton. | A live arthropod,E.g. grasshopper, millipede. | KLB BK IV. *PP 116-7* |  |
| 4-5 | The endoskeleton. | Describe the structure of the endoskeleton. | Observe skeleton of a vertebrate;Compare it with an exoskeleton.Discuss the contrasting features. | *The human skeleton.* | KLB BK IV. *PP 117-8* |  |
| 5 | TEST |  |  |  |  |  |
| 8 | 1 | Locomotory features of a finned fish. | Identify the locomotory features of a finned fish. | Observe external features of a tilapia.Drawing and labeling;Discussion. | *A freshly killed tilapi* |  |  |
| 2-3 | Locomotion in a finned fish. | Explain how locomotion occurs in a finned fish.Explain how a fish is adapted to locomotion in its habitat. | Review external features of a tilapia.Detailed discussion. | *A freshly killed tilapia.* | KLB BK IV. *PP 117-8* |  |
| 4 | Tail power of a fish. | Calculate the tail power of a fish. | Measure length of tail, length of a tilapia fish.Calculations.Discussion on significance of tail power in locomotion. | *A freshly killed tilapia.* | KLB BK IV. *PP 118-9* |  |
| 5 | Support and movement in mammals.The skull and rib cage. | Describe the structure of the skull and rib cage.  | Observe the human skull and rib cage of a rat / rabbit.Detailed discussion. | *Human skull, rib cage of rat / rabbit.* | KLB BK IV. *PP 119-120* |  |
| 9 | 1-2 | The vertebral column.Cervical and thoracic vertebrae. | Describe the features of the vertebral column.Identify types of vertebrae.Explain adaptations of cervical and thoracic vertebrae to their functions. | Examine cervical and thoracic vertebrae. | *Cervical and thoracic vertebrae.* | KLB BK IV. *PP 121-2* |  |
| 3-4 | Thoracic and lumbar vertebrae. | Explain adaptations of Thoracic and lumbar vertebrae to their functions. | Examine thoracic and lumbar vertebrae.Draw labeled diagrams;Brief discussion. | *Thoracic and lumbar vertebrae.* | KLB BK IV. *PP 122-3* |  |
| 9 | 5 | The sacral and caudal vertebrae. | Describe the features of the sacral and caudal vertebrae.Explain adaptations of sacral and caudal vertebrae to their functions. | Examine sacral and caudal vertebrae.Draw labeled diagrams;Brief discussion. | *Sacral and caudal vertebrae.* | KLB BK IV. *P 124* |  |
| 10 | 1-2 | The appendicular skeleton. | Describe the features of the appendicular skeleton. | Examine the appendicular skeleton of a rabbit /sheep.Brief discussion.. | *Appendicular skeleton of a rabbit /sheep.* | KLB BK IV. *PP 124-5* |  |
| 3,4 | Fore limb. | Identify bones of the fore limb. | Examine bones if the fore limb;Drawing labeled diagrams;Discussion. | *Bones of the fore limb.* | KLB BK IV. *PP 126-7* |  |
| 5 | Hind limb. | Identify bones of the hind limb. | Examine bones if the hind limb;Drawing labeled diagrams;Discussion. | *Bones of the hind limb.* | KLB BK IV. *P 127* |  |
| 11-13 |  | END OF TERM EXAMS - TRIAL EXAM  |  |

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| SCHEME OF WORK BIOLOGY FORM FOUR TERM THREE |
| *W**NO* | L/**NO** | TOPIC/*SUBTOPIC* | *LESSON / SPECIFIC**OBJECTIVES* | *TEACHING / LEARNING**ACTIVITIES* | *MATERIALS* */**RESOURCES* | REF. | REMARKS |
| 1 | 1 | Movable joints. | Identify features of movable joints. | Examine the synovial joint.Brief discussion. | Synovial joint model. | KLB BK IV. *P 127* |  |
| 2 | Ball and socket joint. | Identify features of ball and socket joint. | Examine the synovial joint.Discuss observations. | Synovial joint model. | KLB BK IV. *P 128* |  |
| 3,4 | The hinge joint.Movement of a joint. | Identify features of hinge joint.Describe movement of a joint. | Examine a hinge joint.Observe movement of the fore arm;Discussion. | *Illustrative diagrams.* | KLB BK IV. *PP 128-9* |  |
| 5 |  PRACTICAL TEST |
| 2 | 1 | Skeletal muscles. | Describe features of skeletal muscles. | Examine diagrams of skeletal muscles;Brief discussion. | *Illustrative diagrams.* | KLB BK IV. *PP 129-30* |  |
| 2-3 | Smooth or visceral muscles. | Describe features of smooth muscles. | Examine diagrams of smooth muscles;Brief discussion. | *Illustrative diagrams.* | KLB BK IV. *PP 129-30* |  |
| 4-5 | Cardiac muscles. | Describe features of smooth muscles. | Examine diagrams of smooth muscles;Brief discussion;Topic review. | *Illustrative diagrams.* | KLB BK IV. *PP 130-1* |  |
|  |  | *REVISION FOR K.C.S.E. EXAMINATION* |  |  |
|  |  | *K.C.S.E EXAMINATION* |  |  |