APPENDIX - A
GENETICS
MODULE

Supervised by
Dr. (Mrs) Renu Gupta

Developed by
Ms Sushma Tyagi
Heredity and Variations Or Mendelism

About Mendel

Gregor Johann Mendel was born in Austria in the year 1822. He worked as a teacher of natural sciences in a monastery at Brno (Capital of Austria). In the monastery garden he performed historical experiments on pea plant (Pisum sativum) in 1856. He worked for 10 years and presented his work on 8th Feb. 1865 before Brno Natural History Society. The work was published in 1866. The work of Mendel remain unnoticed for another 34 years. In 1900 three different scientists Erich von Tschermak, Karl correns and Hugo de vries rediscovered the work of Mendel. They reached at the conclusions which had already been published by Mendel. By that time Mendel had died (1874). Mendel died unknown and unwept. It was only after his death the significance of work of Mendel was realised and he has been crowned with Father of Heredity.
Methodology

Mendel performed experiments of hybridisation. It means the plants with desired traits are subjected to cross pollination. For example a tall plant is taken and crossed with a dwarf. The seeds procured were sown for the next generation. For hybridisation a plant with desired traits is emasculated. It means removal of the male sex organs. It is to prevent self pollination. The stigma is covered. It is called “Bagging”. It is to avoid undesired cross-pollination. Now the pollen grains from a desired plant are taken and placed on the stigma.
Terminology

1. Allelomorphism - It means existence of two contrasting factors for a character. e.g. stem length exist as tall and dwarf. These contrasting choices are known as Alleles.

2. Dominant and Recessive - Of the two factors a character only one expresses and the other remains hidden. The former is known as dominant and the latter is known as recessive. The characters studied by Mendel has choice (i) as dominant and choice (ii) as recessive.

3. Homozygous and Heterozygous -
Homozygous are the individuals which possess two identical factors for a character. For example TT (Tall) and tt (Dwarf). On the other hand heterozygous are the individuals which possess dissimilar factors for a character. For example Tt (Tall). Homozygous individuals are also called pure whereas heterozygous are also called impure or hybrid.

4. Genotype and Phenotype - Genotype is the actual genetic make-up of the organism. Where it includes both dominant as well as recessive genes. The phenotype is the external appearance of the organism. It is the effect of environment on the genotype.

<table>
<thead>
<tr>
<th>Character</th>
<th>Alleles</th>
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<tbody>
<tr>
<td>1. Height of plant</td>
<td>T (Tall)</td>
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<tr>
<td>2. Seed Shape</td>
<td>R (Round)</td>
</tr>
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<td>3. Colour of cotyledon</td>
<td>Y (Yellow)</td>
</tr>
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<td>4. Colour of Pod</td>
<td>G (Green)</td>
</tr>
</tbody>
</table>
Self Assessment Questions
Hi undefined - here's your first question!

Mendel worked on-

- Edible pea
- Wild pea
- Garden pea
- None of these
Wow Binny - you got them all right!

Wrong Answers: 2
Right Answers: 5

Try again? go
Monohybrid Cross

It is a cross made to study the inheritance pattern of one character at a time. e.g. a tall plant is crossed with dwarf and results in all tall plants.

If a tall is crossed with dwarf, all the plants are tall in F1 generations or first filial generation. (Filia-young one). All F1 plants were tall. The factor for dwarfishness remained hidden which appeared in F2 generation. In this, the plants were produced in a phenotypic ratio of 3:1 and genotypic ratio of 1:2:1.
Dihybrid Cross
It is the study of inheritance pattern of two characters at one time.

P generation
Round yellow RR WW
Wrinkled green rr yy

Gametes
RR x yy

F1 generation
Selfing

Gametes

F2 generation
Phenotypic ratio 9:3:3:1
Tall round = 9
Tall wrinkled = 3
Dwarf round = 3
Dwarf wrinkled = 1

Questions
HERSHEY-CHASE EXPERIMENT

When phage infect bacteria, they attach to the surface of the bacterium and inject the DNA into the cell. The protein coat remains on the outside of the cell.
After two generations in 15N medium, two bands were obtained, one of intermediate density (in which one of the strands contained 15N) and one of low density (in which neither strand contained 15N).
DNA Replication

When DNA replicates its strands are separated by the enzyme helicase. The single stranded DNA binding proteins keep the strands from recombining. One DNA strand encodes the leading strand which forms from its 5’ to its 3’ end using DNA polymerase III. No problem here but the lagging strand presents problems. It has to form from 5’ to 3’ too. It is formed in pieces called Okazaki fragments. First an RNA primase lays down an RNA primer then DNA polymerase III lays down new DNA. The process repeats again & again. DNA Polymerase I replaces the RNA primers with DNA. Finally DNA ligase links the okazaki fragments.
The enzyme helicase. The single stranded DNA binding proteins keep the
Here's question 25

Sugar in RNA is:
- Ribose
- Deoxyribose
- Lactose
- Galactose
Thank You
Performa for Assessment of Genetics CAI Module
(For Subject Experts)

After going through the module you are requested to give your views regarding following aspects of it. You are also requested to give further suggestion (if any) for the improvement of the module.

<table>
<thead>
<tr>
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<th>SA</th>
<th>A</th>
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<tr>
<td><strong>Content:</strong></td>
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<td>Comprehensiveness</td>
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<td>Content matches required curriculum objectives</td>
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<td><strong>Organization of the content:</strong></td>
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<td>Easy to difficult</td>
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<td>Concrete to abstract</td>
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<td>Part to whole</td>
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<td>Simple to complex</td>
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<td>Easy</td>
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<td>Understandable</td>
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Presentation of the content:

- Sequential
- Theoretical & demonstrative
- Use of multisensory approach
- Explanatory
- Self pacing

Evaluation part of the module:

- Language of the statements
- Covering all the aspects of the module
- Topic wise evaluation
- Evaluation as a whole
- Comprehensiveness of the evaluation in terms of:
  a. Knowledge
  b. Understanding
  c. Application
  d. Analysis
  e. Synthesis

Suggestion (if any):  

Signature

SA: Strongly Agree  A: Agree  AV: Average  D: Disagree  SD: Strongly Disagree
REUSABLE BOOKLET OF

GGTI

(For 13 to 17 Years+)

G. C. Ahuja
(Mysore)
MAIN DIRECTIONS

1. Do not open or turn any page of this booklet until you are told to do so.
2. Do not make any mark in this booklet and handle it with care.
3. Answers are to be written on the separate ANSWER-SHEET provided.
4. Place this booklet to your left and the answer sheet to your right.
5. On your separate ANSWERS-SHEET, write your name and other required informations in the proper space.

GENERAL INSTRUCTIONS

1. There are eight tests in this booklet. Each test will be taken one by one. Necessary instructions for marking the answers are given and explained with the aid of practice examples. Be sure that you understand how to work out the problems.
2. Mark all your answers on the make ANSWER SHEET only, and at the appropriate space meant for each test against the same serial number of each test-problem.
3. Work quickly, but try not make mistakes. Each test is to be finished within the prescribed time. Do not waste time on any one problem, if it is difficult for you; leave it and proceed further. If you finish a test before time, revise your answers but do not turn the page till you are instructed to do so.
4. If you have at any time marked a wrong answers, encircle it and mark the other answer. Do not waste time in using rubber.
5. For each test you will be instructed when to begin and when to stop. At the expiry of the time limit, when you are instructed to stop, put down your pencil or pen immediately and turn over the page.
6. Get your doubts cleared before the start of each test, but once the test starts, you are not allowed to ask anything.
7. Do not make any mark in this BOOKLET
8. All these instructions are to be very strictly observed.

[NOW LOOK AT PAGE NUMBER 3]
TEST 1

PRACTICE EXAMPLES

EXAMPLES:

1. I-F-E-V.
   A. Wife       B. Few       C. If We       D. Five       E. Fine

2. I-G-T-H-L.
   A. Sight      B. Flight     C. Light     D. Tight      E. Right

EXPLANATION:

1. Here four letters are given, which are to be arranged in such a way that every letter should be used. The letters are: I-F-E-V. Now observe the given answers which are marked A, B, C, D, and E. The correct answer is 'FIVE'. From the letters I-F-E-V, only 'FIVE' can be formed, which is at D. Look at the ANSWER SHEET for TEST 1 (Practice Examples in the first column at the space meant for page 3 of the Booklet) against Serial Number 1, a cross mark (Like the Multiplication Sign x) is made on D.

2. The Correct answer is at 'C' Mark it yourself. In the ANSWER SHEET against Serial Number 2, make a cross [x] on C.

HOW TO MARK THE TEST PROBLEMS:

You have to make a cross [x] on any of the five answers which are: A, B, C, D, and E, where you make a cross [x] that would be considered your answer. Put one cross mark only, otherwise, you would not be given any credit. Make a cross against the same Serial Number of the Test Problem on the ANSWER SHEET only.

FOR TEST 1, WHERE TO MARK:

You have to mark on the ANSWER SHEET at the space meant for TEST 1 Problems at BOOKLET Page 4.

NUMBER OF PROBLEMS AND TIME-LIMIT:

You are to answer 9 Test Problems in FOUR Minutes.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO
## TEST I

### TEST PROBLEMS

1. **H-I-E-S-M-I-F-C**
   - A. Semicircle
   - B. Mischief
   - C. Knife
   - D. Scientific
   - E. Handkerchief

2. **A-T-I-E-C-B-S-O-N**
   - A. Stable
   - B. Table
   - C. Subtraction
   - D. Capable
   - E. Constable

   - A. Station
   - B. Recapitulation
   - C. Punctuation
   - D. Repetition
   - E. Television

4. **H-G-T-I-H-E**
   - A. Eight
   - B. Highest
   - C. Tiger
   - D. Height
   - E. Tight

5. **G E N A L A G U**
   - A. Gauge
   - B. Luggage
   - C. Old Age
   - D. Language
   - E. Longitude

   - A. Commodity
   - B. Recommendation
   - C. Accommodation
   - D. Declaration
   - E. Communication

7. **N-O-P-I-S-R**
   - A. Piston
   - B. Prime
   - C. Prisoner
   - D. Pioneer
   - E. Prison

   - A. Singer
   - B. Signature
   - C. Singular
   - D. Restaurant
   - E. Resignation

9. **E-D-E-I-N-D-E-N-P-T-N**
   - A. Dependent
   - B. Development
   - C. Independent
   - D. Implement
   - E. Introduction

**STOP HERE**
TEST II

PRACTICE EXAMPLES

EXAMPLES:
1. A. Blade  B. Razor  C. Axe  D. Knife  E. Crow
2. A. Iron  B. Silver  C. Vegetable  D. Gold  E. Copper
3. A. Monday  B. July  C. Tuesday  D. Friday  E. Sunday

EXPLANATION:
1. In the first example, look at all the five words. Out of these five, four words are related to each other in some way, but there is one such word which is absurd and has nothing to do with the other four words. As you know that: Blade, Razor, Axe and Knife are instruments, but the word Crow is at E has nothing to do with these. Now look at the ANSWER SHEET for TEST II (Practice Examples in the first column at the space meant for pages 5 of the BOOKLET) against Serial Number 1, a cross mark [X] is made on E.
2. Similarly, the word Vegetable at C is not related to the remaining four words. Mark it yourself. Against Serial Number 2, make a cross [X] on C.
3. Mark it yourself. Against Serial Number 3, make a cross [X] on B.

FOR TEST II WHERE TO MARK:
You have to make on the ANSWER SHEET at the space meant for TEST II Problems at BOOKLET Page 6.

NUMBER OF PROBLEMS AND TIME-LIMIT:
You are to answer 20 Test Problems in FOUR Minutes.

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<tbody>
<tr>
<td>1</td>
<td>A. Cow</td>
<td>B. Horse</td>
<td>C. Donkey</td>
<td>D. Pigeon</td>
<td>E. Buffalo</td>
</tr>
<tr>
<td>2</td>
<td>A. Delhi</td>
<td>B. Mumbai</td>
<td>C. Calcutta</td>
<td>D. New York</td>
<td>E. Chennai</td>
</tr>
<tr>
<td>3</td>
<td>A. Brother</td>
<td>B. Uncle</td>
<td>C. Grand Mother</td>
<td>D. Niece</td>
<td>E. Servant</td>
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<tr>
<td>4</td>
<td>A. Labourer</td>
<td>B. Lawyer</td>
<td>C. Doctor</td>
<td>D. Professor</td>
<td>E. Engineer</td>
</tr>
<tr>
<td>5</td>
<td>A. Scholarship</td>
<td>B. Prize</td>
<td>C. Freeship</td>
<td>D. Needy</td>
<td>E. Award</td>
</tr>
<tr>
<td>6</td>
<td>A. Discussion</td>
<td>B. Lecture</td>
<td>C. Debate</td>
<td>D. Speech</td>
<td>E. Soliloquy</td>
</tr>
<tr>
<td>7</td>
<td>A. Indian</td>
<td>B. Japanese</td>
<td>C. Russian</td>
<td>D. American</td>
<td>E. Bengali</td>
</tr>
<tr>
<td>8</td>
<td>A. Century</td>
<td>B. Gross</td>
<td>C. Enough</td>
<td>D. Score</td>
<td>E. Dozen</td>
</tr>
<tr>
<td>9</td>
<td>A. Building</td>
<td>B. Mansion</td>
<td>C. Residence</td>
<td>D. Bungalow</td>
<td>E. Don</td>
</tr>
<tr>
<td>10</td>
<td>A. India</td>
<td>B. Pakistan</td>
<td>C. England</td>
<td>D. Goa</td>
<td>E. China</td>
</tr>
<tr>
<td>11</td>
<td>A. English</td>
<td>B. Mathematics</td>
<td>C. Hindi</td>
<td>D. French</td>
<td>E. Latin</td>
</tr>
<tr>
<td>12</td>
<td>A. Photo</td>
<td>B. Snap</td>
<td>C. Reflection</td>
<td>D. Portrait</td>
<td>E. Picture</td>
</tr>
<tr>
<td>13</td>
<td>A. Explain</td>
<td>B. Relate</td>
<td>C. Speak</td>
<td>D. Sing</td>
<td>E. Reveal</td>
</tr>
<tr>
<td>14</td>
<td>A. Leg</td>
<td>B. Knee</td>
<td>C. Toe</td>
<td>D. Ankle</td>
<td>E. Palm</td>
</tr>
<tr>
<td>15</td>
<td>A. Classfellow</td>
<td>B. Colleague</td>
<td>C. Companion</td>
<td>D. Co-worker</td>
<td>E. Neighbour</td>
</tr>
<tr>
<td>16</td>
<td>A. Article</td>
<td>B. Kind</td>
<td>C. Category</td>
<td>D. Grade</td>
<td>E. Class</td>
</tr>
<tr>
<td>17</td>
<td>A. Knife</td>
<td>B. Sword</td>
<td>C. Dagger</td>
<td>D. Gun</td>
<td>E. Razor</td>
</tr>
<tr>
<td>18</td>
<td>A. Godown</td>
<td>B. Stable</td>
<td>C. Meadow</td>
<td>D. Garage</td>
<td>E. Store</td>
</tr>
<tr>
<td>19</td>
<td>A. Sailor</td>
<td>B. Passenger</td>
<td>C. Mahout</td>
<td>D. Driver</td>
<td>E. Pilot</td>
</tr>
<tr>
<td>20</td>
<td>A. Favour</td>
<td>B. Affection</td>
<td>C. Love</td>
<td>D. Liking</td>
<td>E. Regards</td>
</tr>
</tbody>
</table>

STOP HERE
TEST III

PRACTICE EXAMPLES

EXAMPLES:

1. Shoe is to Foot, as Cap is to:
   A. Hand  B. Head  C. Hat  D. Cloth  E. Uniform

2. To be Rich one must have:
   A. Wealth  B. Goodluck  C. Friends  D. Business  E. Locker

3. Train is to Passengers as School is to:
   A. Teachers  B. Parents  C. Students  D. Players  E. Naughty

EXPLANATION:

1. As Shoe is meant for the foot, similarly, Cap is for the Head. The word Head is at 'B'. Now look at the ANSWER SHEET for TEST III (Practice Examples in the first column at the space meant for page 7 of the BOOKLET) against Serial Number 1, a cross mark [x] is made on B.

2. To be Rich, one must have 'Wealth' because, without it no one can be said to be Rich. Mark it yourself. Against Serial Number 2, make a cross [x] on A.

3. The correct answer is at 'C'. Mark it yourself. Against Serial Number 3, make a cross [x] on C.

FOR TEST III WHERE TO MARK:

You have to mark on the ANSWER SHEET at the space for TEST III Problems at BOOKLET Page 8.

NUMBER OF PROBLEMS AND TIME-LIMIT

You are to answer 20 Test Problems in FOUR Minutes.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO
## TEST III

### TEST PROBLEMS

1. Train is to Wheels, as Bird is to:
   - A. Air
   - B. Wings
   - C. Flesh
   - D. Bones
   - E. Beak

2. Failure is to Sadness, as Victory is to:
   - A. Work
   - B. Happiness
   - C. Player
   - D. Soldier
   - E. Enemy

3. Coal is Black, as Grass is to:
   - A. Animal
   - B. Green
   - C. Meadow
   - D. Nature
   - E. Graze

4. Dog is to Nose, as Elephant is to:
   - A. Trunk
   - B. Circus
   - C. Emperor
   - D. Ears
   - E. Teeth

5. Water is to sea, as Sand is to:
   - A. Camel
   - B. Desert
   - C. Stone
   - D. Building Material
   - E. Heat

6. Iron is to Heavy, as Cotton is to:
   - A. Weight
   - B. Cloth
   - C. Light
   - D. Mill
   - E. Farmer

7. Lock is to Key, as Bottle is to:
   - A. Fill
   - B. Label
   - C. Cork
   - D. Shape
   - E. Screw

8. Foot is to Socks, as Hand is to:
   - A. Gloves
   - B. Finger
   - C. Ring
   - D. Arm
   - E. Cripple

9. To be a Scholar, one must have:
   - A. Health
   - B. Library
   - C. Monkey
   - D. Spectacles
   - E. Ability

10. Camera is to Photo, as Tap is to:
    - A. Pipe
    - B. Metal
    - C. Height
    - D. Water
    - E. Children

11. Alive is to Awake, as Dead is to:
    - A. Conscious
    - B. Unconscious
    - C. Brave
    - D. Coward
    - E. Asleep

12. Former is to Later, as Elder is to:
    - A. Older
    - B. Aged
    - C. Younger
    - D. Next
    - E. Tailor

13. Taxi is to Hire, as House is to:
    - A. Occupant
    - B. House Tax
    - C. Homeless
    - D. Rent
    - E. Owner

14. Principal is to Vice Principal, as Monitor is to:
    - A. Teacher
    - B. Head Master
    - C. Second Monitor
    - D. Student
    - E. Class

15. Friendship always involves:
    - A. Courtesy
    - B. Enthusiasm
    - C. Contention
    - D. Agreement
    - E. Co-operation

16. Theater is to Spectators, as Police Station is to:
    - A. Constable
    - B. Inspector
    - C. Gentleman
    - D. Court
    - E. Accused

17. Blood is to Veins, as Pencil is to:
    - A. Lead
    - B. Write
    - C. Rubber
    - D. Pen
    - E. Eye

18. Copying in the Examination Hall is an act of:
    - A. Kindness
    - B. Bravery
    - C. Foolishness
    - D. Entertainment
    - E. Indiscipline

19. Beautiful is to Ugly, as Love is to:
    - A. Handsome
    - B. Parents
    - C. Enjoy
    - D. Hate
    - E. Soul

20. Hair is to Head, as Finger is to:
    - A. Hand
    - B. Body
    - C. Palm
    - D. Thumb
    - E. Point

**STOP HERE**
TEST IV

PRACTICE EXAMPLES

1. How many pencils can be bought for Rs. 3, if each pencil costs 30 Ps.?
   A. 20    B. 15    C. 1    D. 25    E. 10

2. There are three packets of biscuits. Each packet contains one biscuit more than the other in order. In the first packet, there are 22 biscuits. How many biscuits are there in the third packet?
   A. 28    B. 24    C. 23    D. 20    E. 21

EXPLANATION:

1. Each pencil costs 30 Ps. and there are three rupees, or we may say 300 Ps. Thus, 10 pencils can be bought. The correct answer is at 'E'. Look at the ANSWER SHEET for TEST IV (Practice Examples in the first column at the space meant for page 9 of the Booklet) against Serial Number 1, a crossmark [x] is made on E.

2. Each biscuit packet contains one biscuit more than the other, and the first packet contains 22 biscuits. Thus the second packet would contain 23. Similarly, the third packet would contain 24. The correct answer is at 'B'. Mark it yourself. Against Serial Number 2, make a cross on B.

FOR TEST IV, WHERE TO MARK:

You have to mark on the ANSWER SHEET at the space meant for TEST IV Problems at BOOKLET Page 10.

NUMBER OF PROBLEMS AND TIME-LIMIT:

You are to answer 6 Test Problems in FOUR Minutes.

NOTE: For Test IV, no calculations are to be shown anywhere.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO
TEST IV
TEST PROBLEMS

1. In an Arithmetic test, a student attempted 6 questions and secured 60 percent marks. How many questions did he miss?
   A. 6     B. 8     C. 4     D. 12     E. 2

2. If a piece of cloth 10 meters long will shrink to 7 meters when washed how many meters long will a 40 meters long cloth be after shrinking?
   A. 21     B. 20     C. 24     D. 28     E. 35

3. In which of the following ways could 192 pens packed?
   A. 17 boxes with 16 pens each
   B. 14 boxes with 13 pens each
   C. 28 boxes with 9 pens each
   D. 16 boxes with 12 pens each
   E. 12 boxes with 11 pens each

4. A boy sold his pen and with that amount purchased 4 pencils for 19 Ps. each. He had a balance of 24 Ps. with him. For how many Rs. & Ps. did he shell his pen?
   A. 1.50     B. 1.00     C. 0.90     D. 2.20     E. 2.00

5. Three students utter a whole number each. Each speaks the square of the other in order, but the number remains the same. What was such number?
   A. 3     B. 16     C. 27     D. 0.1     E. 1

6. How many oranges can be bought for Rs. 5, at the rate of 2 for 25 Ps.?
   A. 20     B. 100     C. 40     D. 10     E. 5

STOP HERE
# TEST V

## PRACTICE EXAMPLES

<table>
<thead>
<tr>
<th>EXAMPLES</th>
<th>SAME</th>
<th>OPPOSITE</th>
<th>NEITHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit........ Stand</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Look........ See</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Yes........ No</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Go........ Sorry</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Fast........ Quick</td>
<td>?</td>
<td>?</td>
<td>?</td>
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</tbody>
</table>

**EXPLANATION:**

1. Sit means the opposite of stand. Look at the ANSWER SHEET for TEST V (Practice Examples in the first column at the space meant for page 11 of the BOOKLET) against Serial Number 1, a cross is made on O (Meaning Opposite).

2. Look means the same as See. Therefore, against Serial Number 2, a cross is made on S (Meaning Same).

3. Yes means the opposite of No. Mark it yourself. Against Serial Number 3, make a cross on O (Meaning Opposite).

4. Go means neither the Same, nor the Opposite of Sorry. Mark it yourself. Make a cross against Serial Number 4, on N (Meaning that the pair of words is neither the Same nor the Opposite, that is, it is Neither).

5. Mark it yourself. You have to make a cross against Serial Number 5 on S (Meaning Same)

**FOR TEST V, WHERE TO MARK:**

You have to mark on the ANSWER SHEET at the space meant for TEST V Problems at BOOKLET Page 12.

**NUMBER OF PROBLEMS AND TIME-LIMIT:**

You are to answer 40 Test problems in FOUR minutes.

**NOTE:** Remember that if pair of words is Same, you have to make a cross on S. If it is Opposite, then on O. If it is neither Same, nor Opposite, then on N.

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Broad</td>
<td>Narrow</td>
</tr>
<tr>
<td>2.</td>
<td>Victory</td>
<td>Defeat</td>
</tr>
<tr>
<td>3.</td>
<td>Neck</td>
<td>Contended</td>
</tr>
<tr>
<td>4.</td>
<td>Vanish</td>
<td>Satisfied</td>
</tr>
<tr>
<td>5.</td>
<td>Quality</td>
<td>Defeat</td>
</tr>
<tr>
<td>6.</td>
<td>Excellent</td>
<td>Fresh</td>
</tr>
<tr>
<td>7.</td>
<td>Ancient</td>
<td>Delight</td>
</tr>
<tr>
<td>8.</td>
<td>Ancient</td>
<td>Modern</td>
</tr>
<tr>
<td>9.</td>
<td>Excite</td>
<td>Ring</td>
</tr>
<tr>
<td>10.</td>
<td>Confused</td>
<td>Puzzled</td>
</tr>
<tr>
<td>11.</td>
<td>Declare</td>
<td>Announce</td>
</tr>
<tr>
<td>12.</td>
<td>Spy</td>
<td>Invert</td>
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<tr>
<td>13.</td>
<td>Pardon</td>
<td>Forgive</td>
</tr>
<tr>
<td>14.</td>
<td>Pyre</td>
<td>Petrol</td>
</tr>
<tr>
<td>15.</td>
<td>Clarity</td>
<td>Military</td>
</tr>
<tr>
<td>16.</td>
<td>Mingle</td>
<td>Mix</td>
</tr>
<tr>
<td>17.</td>
<td>Queer</td>
<td>Strange</td>
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<td>18.</td>
<td>Merid</td>
<td>Repair</td>
</tr>
<tr>
<td>19.</td>
<td>Danger</td>
<td>Risk</td>
</tr>
<tr>
<td>20.</td>
<td>Vanquish</td>
<td>Root</td>
</tr>
</tbody>
</table>

STOP HERE
TEST VI

PRACTICAL EXAMPLES

PASSAGES:
A. Character consists in little acts honourably done. We should build up by doing well our daily duties and forming good habits.
B. Through newspaper we come to know what is happening not only in our country, but all over the world. In short, it brings the picture of the whole world before our eyes.
C. Socrates resolved never to make a show of this tamper. He believed that an angry man was just like a beast.

PRACTICE EXAMPLES: (Questions based on the above passages.)

1. The word 'Temper' here means:
   A. Ship    B. Fever    C. Voice    D. Anger    E. Tongue

2. The most suitable title for the first Passage 'A' is:
   A. Good habits    B. Character    C. Honor    D. Duty    E. Little Acts

3. To what does Socrates compare an angry man?
   A. Beast    B. Human being    C. Tree    D. Shadow    E. An empty show

EXPLANATION

1. Here you have to answer questions which are based on the above passages. This question has been taken from passage 'C'. According to it, the meaning of the word 'Temper' is 'Anger', which is at 'D'. Look at the ANSWER SHEET for TEST VI (Practice Examples in the first column at the space meant for page 13 of the Booklet) against Serial Number 1, a Cross is made on D.

2. The correct answer is at 'B'. Mark it yourself. Against Serial Number 2, make a cross on B.

3. Mark it yourself. The correct answer is at 'A'. You have to make a cross on A.

FOR TEST VI, WHERE TO MARK:

Your have to mark on the ANSWER SHEET at the space meant for TEST VI Problems at BOOKLET Page 14.

NUMBER OF PROBLEMS AND TIME-LIMIT:

You are to answer 8 Test Problems in FOUR minutes.

NOTE: For Test VI, in the beginning you are given four passages, then eight questions follow. The Questions are based on the given passages. First of all read all the four passages and then take questions one by one and go on marking. Work quickly.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO
TEST VI

TEST PROBLEMS

PASSAGES:
A. The real life of India is not in the cities; it is in the homes of the ordinary people; it is in the villages. The cities present only, one side of the picture, but the majority of the people of India live almost on the borderline of starvation.
B. Once a poor widow who had lost her only son came to Buddha and prayer to him to bring her dead child back to life. The holy man, touched by the great sorrow of the poor woman said, "There is only one medicine that can restore your son to life. Bring me a handful of rice from a house where death has never taken place."
C. Cheerfulness and health go hand in hand. The healthy are cheerful and those who are cheerful are also found healthy. The singing birds fill us with pleasure. Object of nature like fountains, lakes and rivers, also produce pleasing ideas in our minds. Therefore, everything in the universe is a source of joy.
D. Our ancestors had great difficulty in obtaining books. Ours is what to select. We must be careful what be read. There are indeed, books and books, and there are books which Lamp said, are not book at all. Bacon remarked to an unfortunate author, "I will lose no time in reading your book." Others are more than useless, and poison the mind suggestions of evil. Few perhaps realise how much the happiness of life, and the formation of character depend on a wise selection of books we read.

TEST PROBLEMS (QUESTIONS BASED ON THE ABOVE PASSAGES)

1. What did Buddha ask the woman to bring?
   A. Wood
   B. Child
   C. Rice
   D. Gold
   E. Death

2. What request did she make to Buddha?
   A. To bless her with a child
   B. To kill her also
   C. To give her plenty of wealth
   D. To make her son alive again
   E. To give life to her husband

3. The statement, "There are book which are not book at all" means:
   A. These are useful books
   B. The authors of these books are dead
   C. These are not books
   D. These are holy books
   E. These books contain filthy matter

4. Where do we find the real picture of the Indian people?
   A. In the films
   B. In the nature
   C. In the hospital
   D. In the villages
   E. In the cities

5. The word 'Restore' means:
   A. Birth
   B. Alive
   C. Store
   D. Chemist
   E. Bring back

6. Our fore-fathers faced difficulty in:
   A. Reading books
   B. Writing books
   C. Getting books
   D. Selling books
   E. Selecting books

7. 'The cities represent only an incomplete picture' Which word or words have been used to express an incomplete picture?
   A. Narrow
   B. Full
   C. One side of
   D. Half
   E. Ordinary people

8. The most suitable title for the forth passage 'D' is:
   A. Reading of books
   B. Character and books
   C. Selection of books
   D. Abundance of books
   E. An unfortunate author

STOP HERE
## TEST VII

### PRACTICE EXAMPLES

| 1. | 2 | 4 | (?) | 8 | 10 |
| 2. | P | (?) | R | S | T |
| 3. | 10 | 11 | 13 | 16 | (?) | 25 |

### EXPLANATION:

1. You have to write in the bracket on the **ANSWER SHEET** the number that has been omitted from the series. Here the number that has been omitted is 6. Look at the **ANSWER SHEET** for TEST VII (Practice Examples in the first column at the space meant for page 15 of the Booklet) against Serial Number 1, 6 is written in the bracket.

2. Mark it yourself. Against Serial Number 2, write Q in the bracket “(Q)”.

3. You would observe that there is a certain order or arrangement. The increase or decrease is in a systematic manner. Look at the following:

   - The first number is : 10
   - The second number is : 10 plus 1 (11)
   - The third number is : 11 plus 2 (13)
   - The fourth number is : 13 plus 3 (16)
   - The fifth number is : 16 plus 4 (20)

   Mark it yourself. Against Serial Number 3, write 20 in the bracket.

### FOR TEST VII, WHERE TO MARK:

You have to write in the bracket on the **ANSWER SHEET** the number that has been omitted from the series at the space meant for TEST VII Problems at **BOOKLET** Page 16.

### NUMBER OF PROBLEMS AND TIME-LIMIT:

You are to answer 12 Test Problems in **FOUR** minutes.

---

*DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO*
## TEST VII

### TEST PROBLEMS

<p>| | | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>101</td>
<td>(?)</td>
<td>121</td>
<td>131</td>
</tr>
<tr>
<td>2.</td>
<td>63</td>
<td>56</td>
<td>49</td>
<td>(?)</td>
</tr>
<tr>
<td>3.</td>
<td>1</td>
<td>7</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>4.</td>
<td>2</td>
<td>9</td>
<td>(?)</td>
<td>23</td>
</tr>
<tr>
<td>5.</td>
<td>11.9</td>
<td>10.8</td>
<td>9.7</td>
<td>8.6</td>
</tr>
<tr>
<td>6.</td>
<td>Z-A</td>
<td>Y-B</td>
<td>X-C</td>
<td>W-D</td>
</tr>
<tr>
<td>7.</td>
<td>D</td>
<td>H</td>
<td>(?)</td>
<td>P</td>
</tr>
<tr>
<td>8.</td>
<td>P</td>
<td>R</td>
<td>T</td>
<td>V</td>
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<tr>
<td>9.</td>
<td>119</td>
<td>102</td>
<td>85</td>
<td>68</td>
</tr>
<tr>
<td>10.</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>11.</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>12.</td>
<td>25</td>
<td>35</td>
<td>44</td>
<td>(?)</td>
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*STOP HERE*
EXAMPLES:
1. He who teachers in a school is called:
   A. Student  B. Teacher  C. Officer  D. Scholar  E. Professor
2. The saying, “Thing before you speak” means:
   A. Silence is golden.
   B. Don’t speak and be quiet.
   C. Slow and steady wins the race.
   D. Think over it, after you have spoken.
   E. Before starting to speak, think over it.
3. He who steal is called:
   A. Fool  B. Poor  C. Clever  D. Thief  E. Beggar

EXPLANATION:
1. Here you have to select the best out of the five given answers. In a School, it is the Teacher who teacher. The correct answer is at ‘B’. Look at the ANSWER SHEET for TEST VIII (Practice Examples in the first column at the space meant for page 17 of the Booklet) against Serial Number 1, a cross is made on B.
2. The correct answer is at ‘E’. Mark it yourself. Against Serial Number 2, make a cross on E.
3. Mark it yourself. You have to make a cross on D.

FOR TEST VIII, WHERE TO MARK:
You have to mark on the ANSWER SHEET at the space meant for Test VIII Problems at BOOKLET Pages 18 and 19.

NUMBER OF PROBLEMS AND TIME LIMIT:
You are to answer 20 Test Problems in FOUR minutes.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO
<table>
<thead>
<tr>
<th>TEST VIII</th>
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<tbody>
<tr>
<td>TEST PROBLEMS</td>
</tr>
<tr>
<td>1. He who tells a lie is called:</td>
</tr>
<tr>
<td>A. Lawyer  B. Disobedient  C. Honest  D. Liar  E. Naughty</td>
</tr>
<tr>
<td>2. He who writes book is called:</td>
</tr>
<tr>
<td>A. Teacher  B. Publisher  C. Scholar  D. Author  E. Steno</td>
</tr>
<tr>
<td>3. He who is always in time is called:</td>
</tr>
<tr>
<td>A. Punctual  B. Optimist  C. Lazy  D. Serious  E. Good</td>
</tr>
<tr>
<td>4. He who is new to a certain place is called:</td>
</tr>
<tr>
<td>A. Stranger  B. Hawker  C. Minister  D. Poet  E. Philosopher</td>
</tr>
<tr>
<td>5. One who is locked up in jail is called:</td>
</tr>
<tr>
<td>A. Constable  B. Thief  C. Robber  D. Prisoner  E. Foreigner</td>
</tr>
<tr>
<td>6. That which remains unaffected by water is called:</td>
</tr>
<tr>
<td>A. Water Proof  B. Umbrella  C. Raincoat  D. Plastic  E. Leather</td>
</tr>
<tr>
<td>7. A woman whose husband is not alive is called:</td>
</tr>
<tr>
<td>A. Widower  B. Unfortunate  C. Married  D. Widow  E. Maidan</td>
</tr>
<tr>
<td>8. He who slaughters animals is called:</td>
</tr>
<tr>
<td>A. Cruel  B. Animal  C. Non-vegetarian  D. Customer  E. Butcher</td>
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<tr>
<td>9. The saying 'A word for the wise and rod for the foolish' means:</td>
</tr>
</tbody>
</table>
|   A. All men are wise  
|   B. Give desirable treatment to all  
|   C. For a wise man only a hint would do, but not for the fool who is subject to punishment  
|   D. It is no use to cry over spilt milk.  
|   E. Fools are wiser than the wise. |
| 10. He who does not believe in God is called: |
|   A. Thiest  B. Preacher  C. Athiest  D. Worried  E. Prophet |

GO ON TO THE NEXT PAGE
11. When we think, we  
A. Dream  B. Sing  C. Concentrate  D. Sit  E. Sleep

12. He who serves in a hotel is called: 
A. Cook  B. Waiter  C. Manager  D. Servant  E. Tray

13. He who ploughs the land is called: 
A. Worker  B. Landlord  C. Labourer  D. Villager  E. Peasant

14. The saying 'Nip the evil in the bud' means: 
A. Honesty is the best policy  
B. We should avoid doing bad acts  
C. Evil is in the bud  
D. Nip the bud in the evil  
E. To stop bad actions at the initial stage.

15. A gentleman is one who does not:  
A. Go to see pictures  B. ilke others  
C. Inflact pain on others  D. Marry  E. Steal

16. The saying 'A rolling stone gathers no moss' means: 
A. We should not think work  
B. Moss cannot be collected by the stones  
C. We should move from place to place  
D. If we keep shifting, we cannot achieve much  
E. Change is the law of nature

17. The voice that can be heard is called:  
A. Audible  B. Clear  C. Loud  D. Visible  E. Low

18. A child born after the death of his father is called:  
A. Innocent  B. Poor  C. Unfortunate  D. Orphan  E. Postman

19. He who compiles words in the printing press is called:  
A. Pressman  B. Compositor  C. Manager  
D. Client  E. Builder

20. That which is hated is called:  
A. Injurious  B. Painful  C. Dishonored  D. Contemptible  
E. Disastrous.

STOP HERE
Achievement test - Subject-Biology

Unit- Genetics

Max. marks: 60

Time: 60 min.

Instructions:

- Test comprises of 60 multiple choice questions.
- Each question carries one mark.
- Put ( ) mark against the selected response.

Choose the correct answer:

1. In dihybrid cross PpRr, F₂ progeny of PPRR, PPRr and PpRr occurs in the ratio of
   a. 1:1:1:1
   b. 9:3:3:1
   c. 1:2:2:1
   d. 1:2:2:4

2. Removal of anthers of a flower during breeding experiment is
   a. Anthesis
   b. Emasculation
   c. Anther operation
   d. Pollination

3. Epistasis in which dihybrid ratio of 9:3:4 is obtained
   a. Recessive epistatic gene
   b. Dominant epistatic gene
   c. Inhibitory gene
   d. Polymeric gene

4. Human intelligence is controlled by
   a. 7 pairs of genes
   b. 3 pairs of genes
   c. 25 pairs of genes
   d. 5 pairs of genes

5. A child with mother of blood group A and father AB group will not have the following blood group
   a. A only
   b. B
   c. AB
   d. O
6. Which of the following combination will result in erythroblastosis?
   a. Male Rh +ve & female Rh +ve
   b. Male Rh -ve & female Rh +ve
   c. Male Rh +ve & female Rh –ve
   d. Male Rh -ve & female Rh –ve

7. Which banding pattern is exclusively for human chromosomes?
   a. R-banding with sulphur deficient regions
   b. G-banding with sulphur rich regions
   c. Q-banding with A-T rich regions
   d. C-banding with hetrochromatic regions

8. Which of the following is the sterile female?
   a. AA + XY
   b. AAA + XY
   c. AA + XO
   d. AA + XX

9. In butterflies, males have chromosome complement as:
   a. ZW
   b. XY
   c. ZZ
   d. ZO

10. Match the correct sequence
    (a) Monosomic (i) 2n + 2
    (b) Down’s syndrome (ii) 2n – 2
    (c) Nullisomic (iii) 2n – 1
    (d) Tetrasomic (iv) 45 + XY
    
    a. (a)-(iii),(b)-(iv),(c)-(ii),(d)-(i)
    b. (a)-(iii),(b)-(ii),(c)-(iv),(d)-(i)
    c. (a)-(iv),(b)-(iii),(c)-(ii),(d)-(i)
    d. (a)-(ii),(b)-(iii),(c)-(i),(d)-(iv)

11. Hypertrichosis is
    a. Sex limited trait
    b. Sex influenced trait
    c. Cytoplasmic inheritance
    d. Y-linked trait
12. Nucleosome core is made up of
   a. H1, H2A, H2B & H3
   b. H2A, H2B, H3 & H4
   c. H1, H2A, H2B, H3 & H4
   d. H1, H2A, H3 & H4

13. The symptomatic treatment of genetic disorder in human being is
   a. Euthenic
   b. Eugenics
   c. Euphenic
   d. Kalology

14. Both husband and wife have normal vision though their fathers were colourblind. The probability of their daughter becoming colour blind is
   a. 25%
   b. 50%
   c. 75%
   d. 0%

15. Two linked genes ‘a’ and ‘b’ show 30% recombination. The individuals of a dihybrid cross between ++/++ x ab/ab shall show the types and proportion of gametes in F1 as
   a. ++80% : ab20%
   b. ++50% : ab50%
   c. ++35% : ab35% : a15% : +15%
   d. ++30% : ab30% : a20% : b20%

16. Match the following correctly
   (1)A DNA  (i) 9 base pair/turn
   (2)B DNA  (ii) 10 base pair/turn
   (3)C DNA  (iii) 12 base pair/turn
   (4)Z DNA  (iv) 11 base pair/turn
   a. (1)-(iv), (2)-(iii), (3)-(i), (4)-(ii)
   b. (1)-(ii), (2)-(iii), (3)-(iv), (4)-(i)
   c. (1)-(iv), (2)-(ii), (3)-(i), (4)-(iii)
   d. (1)-(iii), (2)-(ii), (3)-(i), (4)-(iv)

17. The factor responsible for termination of polypeptide chain in vitro is
   a. Factor- γ
   b. Eu-Tf
   c. Factor - β
   d. Factor –ρ
18. In 1976 Hargobind Khorana synthesised a functional gene to code for t-RNA tyrosine by linking:
   a. 77 nucleotide base pairs
   b. 97 nucleotide base pairs
   c. 207 nucleotide base pairs
   d. 107 nucleotide base pairs

19. Barbara McClintock is associated with the discovery of
   a. Jumping genes
   b. Transposon
   c. Transposable element
   d. All of these

20. t-RNA recognises aminoacyl synthetase enzyme by
   a. Anticodon
   b. DHU loop
   c. Tc loop
   d. AA-site

21. Which one is natural genetic engineer of plants?
   a. Rhizobium meliloti
   b. Bacillus thuringenesis
   c. Agrobacterium tumefaciens
   d. E. coli

22. Molecular scissors are
   a. Transriptase
   b. Ligases
   c. Endonucleases
   d. Polymerases

23. Which technology may eventually replace conventional gene cloning technique?
   a. Recombinant DNA technology
   b. PCR
   c. VNTR
   d. None of these

24. Which is not true about recombinant DNA technology?
   a. Liposomes do not act as vehicle DNA
   b. Requires passenger DNA
   c. Requires desired genes
   d. Requires host cell
25. Which is not used in plant tissue culture?
   a. GA3
   b. Coconut milk
   c. Corn milk
   d. Vitamin C

26. Find out the wrong match in relation to application of plant genetic engineering
   a. Tomato & viral resistance
   b. Rice & rich in vitamin A
   c. Cotton & herbicide resistance
   d. Potato & herbicide resistance

27. Which one is not a recalcitrant seed?
   a. Cocoa
   b. Coconut
   c. Jack fruit
   d. Rice

28. VNTR possess
   a. 10-60 base pairs
   b. 11-60 base pair
   c. 12-50 base pair
   d. 10-50 base pair

29. Pseudomonas putida is associated with
   a. Oil spills
   b. N2-fixation
   c. Control of pest
   d. Gene therapy

30. What is true about clone?
   a. Produced asexually
   b. Genetically identical
   c. Derived from a single parent
   d. All of these

31. Find the correct match
   (1) UAA       (i) Amber
   (2) UAG       (ii) Ambiguous
   (3) UGA       (iii) Ochre
   (4) GUG       (iv) Opal
a. (1)-(iii), (2)-(i), (3)-(iv), (4)-(ii)  
b. (1)-(iii), (2)-(i), (3)-(ii), (4)-(iv)  
c. (1)-(ii), (2)-(i), (3)-(iii), (4)-(iv)  
d. (1)-(iv), (2)-(iii), (3)-(i), (4)-(ii)  

32. A gene pool is  
   a. Total number of genes present in an individual  
   b. Total number of genes in the reproductive gametes of a population  
   c. Total number of genes present in maternal and paternal grandparents  
   d. None of these  

33. In eukaryotes, the synthesis of r-RNA, m-RNA & t-RNA are catalysed by  
   a. RNA polymerase I  
   b. RNA polymerase II  
   c. RNA polymerase III  
   d. All of these  

34. The number of different gametes produced from a plant with genotype RRYy will be  
   a. 8  
   b. 16  
   c. 4  
   d. 6  

35. Patau’s, Down’s and Edward’s syndromes are due to  
   a. Nullisomy of chromosome number 13, 21 and 18 respectively  
   b. Trisomy of chromosome number 13, 18 and 21 respectively  
   c. Trisomy of chromosome number 13, 21 and 18 respectively  
   d. Monosomy, Trisomy and Tetrasyomy respectively  

36. Trihybrid ratio observed by Devinport is  
   b. 1 : 4 : 6 : 4 : 1  
   c. 27 : 9 : 9 : 3 : 3 : 3 : 1  
   d. All of these  

37. In pedigree analysis if the case history starts from a female it is known as  
   a. Proband  
   b. Proposita  
   c. Prospitus  
   d. None of these  

38. DNA template sequence of ATACGTAG is transcribed over m-RNA as  
   a. TATGCATC  
   b. UAUGCAUC
c. UATGCTCU
d. UAUGCATC

39. A gynandromorph arise as a result of
   a. Mutation
   b. Arrest of mitosis
   c. Arrest of meiosis
   d. Defective mitosis

40. When a purine is replaced by another purine due to tautomeric nitrogen bases, it results in
   a. Transition
   b. Transversion
   c. Transformation
   d. Transduction

41. Sir Archibald Garrod's name is associated with the birth of
   a. Mutation theory
   b. Cell theory
   c. Gene Enzyme theory
   d. Human genetics

42. Gene mutation is caused by
   a. Reproduction
   b. Linkage
   c. Change in sequence of nitrogenous base
   d. Change in the sequence of genes in DNA

43. Mating in close relations is referred as
   a. Consaguinous marriage
   b. Line breeding
   c. Inbreeding
   d. Cross breeding

44. An individual receiving like genes for same character from its parents is termed as
   a. Allelomorphic
   b. Homozygous
   c. Heterozygous
   d. Azygous

45. The short fragments of DNA produced in the lagging strand during duplication is known as
   a. Okazaki fragments
   b. RNA primer
   c. Leading strand
   d. Recombinant DNA
46. The initiation codon for protein synthesis is
   a. GUG
   b. CUG
   c. AUG
   d. AUU

47. Mutations can be induced by X-rays, was revealed by
   a. Stanley Miller
   b. Bridge
   c. Muller
   d. Darlington

48. The inheritance of blood groups in man shows
   a. Quantitative characters
   b. Qualitative characters
   c. Multiple alleles
   d. polygenic traits

49. Which of the following is not an example of polygenic inheritance?
   a. Colour of Wheat kernel
   b. Haemophilia in man
   c. Colour of skin in man
   d. Ear length in Maize

50. Crossing over occurs in
   a. Leptotene
   b. Zygotene
   c. Pachytene
   d. Diakinesis

51. Genes are made up of
   a. Histones
   b. A portion of DNA
   c. Hydrocarbons
   d. Lipoproteins

52. Semiconservative nature of the replication of eukaryotic chromosome was experimentally demonstrated by
   a. Cairns
   b. Meselson & Stahls
   c. Herbert Taylor
   d. Hershey & Chase
53. DNA fingerprinting is based on
   a. RFLP
   b. VNTR
   c. SSR
   d. All of these

54. Father of DNA printing is
   a. Khorana
   b. Alec Jeffreys
   c. Lalji Singh
   d. R.N. Singh

55. Test cross is
   a. Hybrid plant back crossed with dominant parent
   b. Hybrid plant crossed with recessive parent
   c. Inbreeding
   d. Outcrossing

56. The sum total of genes in a population is known as
   a. Gene bank
   b. Gene linkage
   c. Gene pool
   d. Genome

57. Mendel did not recognise the linkage phenomenon in his experiments because
   a. He did not have powerful microscope
   b. He studied only pure plants
   c. There were many chromosomes to handle
   d. Characters he studied were located on different chromosomes

58. The parallelism between factors and chromosome led to
   a. Cell theory
   b. Chromosome theory of heredity
   c. Pangenesis
   d. Mapping of genes

59. The gametes are haploids and body cells are diploid was revealed by
   a. Landsteiner
   b. Jansen
   c. Bensen
   d. Johansen
60. In a dihybrid cross if parental types exceed the recombination types among the resultant progeny, it is due to

a. Linkage  
b. Complete linkage  
c. Independent assortment  
d. Crossing over
Scoring key of Achievement test - Subject-Biology

Unit- Genetics

1. d 31. a
2. b 32. b
3. a 33. d
4. c 34. c
5. d 35. c
6. c 36. a
7. b 37. b
8. c 38. b
9. c 39. d
10. a 40. a
11. d 41. d
12. b 42. c
13. c 43. c
14. d 44. b
15. c 45. a
16. c 46. c
17. d 47. c
18. c 48. c
19. d 49. a
20. b 50. c
21. c 51. b
22. c 52. b
23. b 53. d
24. a 54. b
25. d 55. b
26. d 56. a
27. d 57. c
28. b 58. b
29. a 59. c
30. d 60. a
Reaction Towards Computer Assisted Instruction Scale

(For Experimental Group Students)

I-Content:                      VG    G    A    P    VP

1. CAI is an appropriate media for gaining learner’s attention.
2. Objectives are clearly framed following Bloom’s taxonomy.
3. Linkage to previous knowledge is clearly established.
4. Learning content is sequenced following easy to complex way.
5. Involvement of learner in “Self Assessment Questions” confirm their achievement.
6. Appropriate feedback & reinforcement is provided.
7. Practice questions foster mastery learning.
8. The language used (text & audio) along with its fluency & correctness has been given due weightage.
9. Distinctive stimuli/media are used accurately and authentically to support learning.
10. Content provide opportunity for learner’s to apply the outcome of their learning in a real world environment.

II-Media Elements & Innovative strategy

1. Graphics, pictures, derivational expressions and videos are appropriately used to keep learner’s senses focused.
2. Quality of visual communication (choice of colours, fore ground, back ground, resolution and choice of format are well organized.
3. Audio communication is good enough to help the learner in imbibing the subject matter.

4. Use of audio and visuals (pictures and videos) is with proper proportions.

5. Use of navigation items (forward, backward buttons) is consistent throughout the module, to facilitate the learner.

6. Various techniques are integrated properly to present the content effectively.

7. Screen is well planned and designed to facilitate the learner.

8. New ways of presentation of facts are used effectively.

9. Self assessment questions following each sub-content reinforces the learner and ensures active engagement in module.

10. Module provides full opportunity for self paced learning.

Content effectiveness

1. It fulfills the instructional objectives.

2. Degree of involvement of the learners motivates them to think divergently.

3. Ability to generalize the knowledge.

4. Ability to relate the knowledge in larger and global context so as to see full implications of issues.

5. Ability to critically evaluate the real life observations on the basis of gained knowledge.

VG- Very Good; G- Good; A- Average; P- Poor; VP- Very Poor
Traditional Teaching Snaps: