



BIOLOGY

BOOKS - NAVBODH BIOLOGY (HINGLISH)

**MATCH THE COLUMNS/MATCH THE
PAIRS/COMPLETE THE TABLE**

Chapter 1 Genetic Basis Of Inheritance

1. Match the Columns :

Column I	Column II
(1) Gregor Mendel	(a) Inheritance of skin colour
(2) William Bateson	(b) Polygenic inheritance of wheat kernel colour
(3) H. Nilsson-Ehle	(c) Father of genetics
(4) Davenport	(d) Coined the term genetics



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2. Match the Columns :

Column I	Column II (Work)
(1) Hugo de Vries	(a) Method to find out all possible genotypes
(2) Karl Correns	(b) Publication of Mendel's research in Flora
(3) R. C. Punnett	(c) Rediscovery of Mendel's findings
(4) Erich Tschermak	(d) Postulated three laws of inheritance



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3. Match the Columns :

Column I	Column II (Ratio)
(1) Dihybrid cross	(a) 1 : 1 : 1 : 1
(2) Incomplete dominance	(b) 2 : 1
(3) Pleiotropy	(c) 1 : 2 : 1
(4) Dihybrid test cross	(d) 9 : 3 : 3 : 1



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4. Match the Columns :

Column I	Column II
(1) Multiple allele	(a) Colour of flowers in snapdragon
(2) Incomplete dominance	(b) Sickle cell anaemia
(3) Pleiotropism	(c) Human skin colour
(4) Polygenic inheritance	(d) ABO blood group in human beings



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5. Complete the table :

Genotype	Phenotype (<i>July '19</i>)
(1) $I^A I^A$ or $I^A i$	(a)
(2)	(b) B
(3) $I^A I^B$	(c)
(4)	(d) O



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6. Complete the table :

Interaction Type	Ratio	Example
(1) Incomplete dominance	Flowers of 4 'o' clock plant
(2)	1 : 2 : 1	Coat Colour in cattle
(3) Pleiotropism	2 : 1
(4) Polygenic inheritance	Wheat kernel colour



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Chapter 2 Gene Its Nature Expression And Regulation

1. Match the Columns :

Column I (Scientists)	Column II (Work done / Discovery)
(1) Watson and Crick	(a) Lac operon in <i>E. coli</i>
(2) Griffith	(b) Semiconservative DNA replication
(3) Hargobind Khorana	(c) Study of DNA structure
(4) Jacob and Monad	(d) Deciphered genetic code by using m-RNA templates
	(e) Experiment of transformation



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2. Match the Columns :

Column I (Scientists)	Column II (Work done)
(1) Avery, Meleod, McCarty	(a) Semiconservative DNA replication
(2) Messelson and Stahl	(b) Separation of nuclein from pus cells
(3) Friedrich Miescher	(c) Wobble hypothesis
(4) Crick	(d) DNA, the transforming principle



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3. Match the columns :

Column I	Column II
(1) Splicing	(a) At 5' end addition of methyl guanosine
(2) Translocation	(b) Addition of adenylate residue at 3' end
(3) Capping	(c) Removal of introns from m-RNA
(4) Tailing	(d) Movement of ribosome on m-RNA



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4. Complete the table :

Non-Genetic RNA	Structure	Function
(1)	Simple and	Carrier of coded information
(2) t-RNA	Carrier of specific amino acid
(3) r-RNA	Single stranded and folded



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1. Find the mismatched pair :

(1) Insertion of vector in bacterial cell -

Transformation

(2) Insertion of vector in eukaryotic cell -

Transfection

(3) Insertion of viral vector - Transduction

(4) Insertion of vector in plant cell -

Transposition



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2. Match the Columns :

Column I (Type)	Column II (therapeutic product of r-DNA technique)
(1) Blood protein	(a) Lysozyme
(2) Human hormone	(b) Cytomegalovirus
(3) Immune modulator	(c) Erythropoietin
(4) Vaccine	(d) Insulin



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3. Match the Columns :

Column I (Host)	Column II (Suitable vector)
(1) Bacteria	(a) Baculovirus
(2) Insects	(b) YAC
(3) Plants	(c) Lambda phage
(4) Yeasts	(d) Ti plasmid



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4. Complete the table related to steps of PCR technique :

Event	Temperature	Act / Role / Purpose
(1) Heat denaturation	Breaking of H bonds to make ss-DNA
(2)	Pairing of primers to ss-DNA
(3) Polymerisation	72° C



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1. Complete the table :

Name of Pathogen	Name of disease resistant plant	Name of the disease
(1) Fungi	Himgiri of wheat and
(2) of cauliflower	Black rot
(3) Virus of chilli and



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2. Match the columns :

Column I (Hybrid varieties)	Column II (Crop)
(1) Sonalika and Kalyansona	(a) Sugar cane
(2) Jaya and Ratna	(b) Wheat
(3) Co 421 and Co 419	(c) Rice



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3. Complete the table :

Column I (Plant)	Column II (Product by suspension culture)
(1)	Menthol
(2)	Nicotine
(3)	Anthocyanin



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4. Name the plant source for secondary metabolite produced by suspension culture :

Plant	Product
(1)	Vincristin, Vinblastin
(2)	Tropane
(3)	Anthocyanin



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5. Complete the column of crop plants, variety and resistance to pest or disease :

Crop plant	Resistant Variety	Resistance to disease/pest
(1) Okra	Shoot and fruit borer
(2) <i>Brasica</i>	Pusa Gaurav
(3)	Pusa Shubhra	Curl and blight



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Chapter 5 Microbes In Human Welfare

1. Match the products with their microbial source :

Column I	Column II
(1) Lipase	(a) <i>Streptomyces erythreus</i>
(2) Erythromycin	(b) <i>Rhizopus spp</i>
(3) Gluconic acid	(c) <i>Pseudomonas denitrificans</i>
(4) Vitamin B ₁₂	(d) <i>Aspergillus niger</i>



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2. Match the following :

Column I	Column II
(1) Invertase	(a) <i>Trichoderma konigi</i>
(2) Lipase	(b) <i>Saccharomyces cerevisiae</i>
(3) Cellulase	(c) <i>Sclerotiana libertine</i>
(4) Pectinase	(d) <i>Rhizopus Spp.</i>



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3. Complete the table :

Microbial pesticide type	Name	Host-range
(1)	<i>Bacillus thuringiensis</i>	Beetles and Wax moth
(2) Fungi	Aphids and Mites
(3) Protozoan	Grasshopper and Crickets
(4) Virus	NPV and



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4. Complete the table for biofertilizers :

Type of biofertilizer	Source / kind	Suitable crop plant
(1)	<i>Rhizobium phaseoli</i>	Bean
(2) Cyanobacterial	<i>Anabaena azollae</i>
(3) Fungal	Crop plants in less irrigated areas



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5. Complete the table for edible mushrooms :

Common name	Biological name
(1) White button mushroom
(2)	<i>Volvariella volvacea</i>
(3) Oyster mushroom



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6. Find the mismatched pair :

(1) Rhizobium - Symbiotic biofertilizer

(2) Nostoc - Ectomycorrhiza

(3) Azotobacter - Free living biofertilizer

(4) Azolla - Aquatic fern.



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Chapter 6 Photosynthesis

1. Match the Columns :

Column I	Column II
(1) <i>Kalanchoe</i>	(a) Photoautotroph
(2) <i>Amaranthus</i>	(b) CAM plant
(3) <i>Chromatium</i>	(c) Chemoautotroph
(4) <i>Nitrosomonas</i>	(d) Kranz anatomy



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2. Match the Columns : (Photosynthetic pigments)

Column I	Column II
(1) Chlorophyll-a	$C_{55}H_{70}O_6N_4 Mg$
(2) Chlorophyll-b	$C_{55}H_{72}O_5N_4 Mg$
(3) Carotenes	$C_{40}H_{56}O_2$
(4) Xanthophylls	$C_{40}H_{56}$



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3. Complete the table (Photosynthetic pigments):

Type of pigment	Colour	Formula
(1) Chlorophyll-a	$C_{55}H_{72}O_5N_4 Mg$
(2)	Yellow	$C_{40}H_{56}O_2$
(3) Chlorophyll-b
(4)	Orange



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Chapter 7 Respiration

1. Match the Columns :

Column I (Activity)	Column II (Site)
(1) Glycolysis	Matrix of mitochondria
(2) Link reaction	Oxysomes
(3) Krebs Cycle	Cytoplasm
(4) Electron transport system	Perimitochondrial space



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2. Complete the table (Anaerobic respiration) :

Process	Substrate	Product	Organism
(1) Alcoholic fermentation	Alcohol
(2)	Milk sugar (Lactose)	Lactic acid



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3. Match the Columns :

Column I (Substrate)	Column II (Respiratory quotient)
(1) Carbohydrates	(a) 0.7
(2) Proteins	(b) 1
(3) Fats	(c) ∞ (Infinity)
(4) Anaerobic respiration	(d) 0.9



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Chapter 8 Reproduction In Plants

1. Match the Columns :

Column A (Asexual Reproduction)	Column B (Organism)
(1) Binary fission	(a) Yeast
(2) Budding	(b) <i>Chlamydomonas</i>
(3) Conidia	(c) <i>Penicillium</i>
(4) Zoospores	(d) <i>Amoeba</i>



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2. Match the Columns :

Column A (Vegetative Propagation)	Column B (Plant)
(1) Non fleshy roots	(a) Potato
(2) Tuberous roots	(b) <i>Asparagus</i>
(3) Fasciculated tuberous roots	(c) Sweet potato
(4) Stem tuber	(d) <i>Albizzia</i>



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3. Complete the table :

Sr. No.	Agencies	Type of Pollination (<i>March '19</i>)
1	Water
2	Entomophily
3	Bat
4	Ornithophily



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4. Complete the table : (Type of pollination and agents)

Agent	Pollination	Example
(1) Wind	Jowar
(2)	<i>Vallisneria</i>
(3)	Entomophily	Rose
(4) Bats	Baobab tree
(5) Bee	Lever mechanism



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5. Match the Columns : (Outbreeding devices)

Column I (Mechanism)	Column II (Plant)
(1) Protandry	(a) Orchid
(2) Protogyny	(b) Castor
(3) Self sterility	(c) Sunflower
(4) Unisexuality	(d) <i>Michelia</i>



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Chapter 9 Organisms And Environment I

1. Match the Columns :

Column I	Column II (Activity)
(1) Catabolism	(a) Formation of partially decomposed organic matter
(2) Leaching	(b) Breaking down of detritus into small particles
(3) Fragmentation	(c) Degradation of detritus with enzymes of decomposers
(4) Humification	(d) Release of inorganic nutrients
(5) Mineralization	(e) Water soluble inorganic nutrients go down in soil



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2. Match the Columns :

Column I	Column II
(1) Energy flow in ecosystem	(a) Vertical spatial pattern
(2) Zonation	(b) Horizontal spatial pattern
(3) Stratification	(c) Jhum cultivation
(4) Deforestation	(d) Unidirectional



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Chapter 10 Origin And Evolution Of Life

1. Match the Columns :

Evolutionary theory	Scientist / Proposer
(1) Theory of special creation	(a) Oparin – Haldane
(2) Panspermia theory	(b) Aristotle
(3) Theory of abiogenesis	(c) Richter
(4) Theory of chemical evolution	(d) Father Sudrez



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2. Match the Columns :

Fossils	Location
(1) <i>Australopithecus</i>	(a) Siwalik Hills
(2) <i>Dryopithecus</i>	(b) Haritalyanga, India
(3) <i>Ramapithecus</i>	(c) Fayum, Egypt
(4) <i>Homo habilis</i>	(d) Taung, South Africa



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3. Complete the table :

Fossil stage of human evolution	Geologist	Location
<i>Australopithecus</i>	South Africa
.....	Java
.....	Fuhlrott
Cro Magnon	France



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Chapter 11 Chromosomal Basis Of Inheritance

1. Match the Columns :

Column I	Column II
(1) Turner's syndrome	(a) 32
(2) Down's syndrome	(b) 46
(3) Normal woman	(c) 45
(4) Queen bee	(d) 47



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2. Match the Columns :

Column I	Column II
(1) Turner's syndrome	(a) Holandric genes
(2) Down's syndrome	(b) AA + XO
(3) Y chromosome	(c) Quantitative abnormality of haemoglobin
(4) Thalassemia	(d) Simian crease



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3. Pick out the correct statements :

(a) Haemophilia is a sex-linked recessive disease.

(b) Down's syndrome is due to aneuploidy .

(c) Phenylketonuria is an autosomal recessive gene disorder .

(d) Sickle cell anaemia is an X - linked recessive gene disorder



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1. Match the Columns :

Column I	Column II
(1) Developing technique of DNA fingerprinting	(a) Wyman and White
(2) Purification of insulin from Dog's pancreas	(b) Lalji Singh
(3) Developing banded krait minisatellite	(c) Banting and Best
(4) VNTRs isolated for the first time	(d) Alec Jeffreys



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2. Match the Columns :

Column I	Column II
(1) Tissue plasminogen activator	(a) Treating haemophilia
(2) Tissue growth factor - β	(b) Cystic Fibrosis
(3) Factor VIII	(c) Wound healing
(4) DNase	(d) Reverse blood clots



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Chapter 13 Human Health And Diseases

1. Match the Columns :

Column I	Column II
1) Anatomical barriers	(a) Histamines
2) Physiological barriers	(b) Kupffer's cells
3) Phagocytic barriers	(c) Lysozyme and interferons
4) Inflammatory barriers	(d) Skin and mucous membrane



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2. Match the Columns :

Column I	Column II
(1) Typhoid	(a) Diethylcarbamazine
(2) Pneumonia	(b) <i>Vivotif Berna</i>
(3) <i>E. histolytica</i>	(c) RSV
(4) Filariasis	(d) Cyst



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3. Match the Columns :

Column I	Column II
(1) Carcinoma	(a) Thyroid and pituitary
(2) Sarcoma	(b) Thymus
(3) Lymphoma	(c) Bone marrow
(4) Leukemia	(d) Femur and biceps
(5) Adenoma	(e) Lung and breast



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4. Match the Columns :

Group 'A'	Group 'B'
(1) Diethyle cabamacine	(a) AIDS
(2) Widal test	(b) Pneumonia
(3) Albendazole	(c) Filariasis
(4) HAART	(d) Typhoid
	(e) Ascariasis



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5. Complete the table :

Blood group	Genotype	Antigen on surface of RBC	Antibody in serum	Can donate blood to	Can receive blood from
A or	Antibody b	A, O
B or	B	B, AB
AB	Nil	A, B, AB, O
O	Nil	A, B, AB, O



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6. Complete the table :

Drug type	Scientific name	Effect / action on	Common name
.....	<i>Papaver somniferum</i>	CNS and gastrovascular system
Cannabinoids	Hashish, charas
Cocaine	<i>Erythroxylum coca</i>	Coke, crack
Sedatives	Cure for Insomnia and depression	LSD



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1. Match the Columns :

Column I	Column II
(1) Inbreeding	(a) Hisardale breed
(2) Out breeding	(b) Overcoming inbreeding depression
(3) Out crossing	(c) Increase in homozygosity
(4) Cross-breeding	(d) Unrelated animals



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2. Match the Columns :

Causative agent	Disease
(1) Bacteria	(a) Pullorum
(2) Virus	(b) Round worm
(3) Fungus	(c) Bronchitis
(4) Parasite	(d) Thrush



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3. Pick out the correct match :

Column A	Column B	Column C
(1) Mackerel	<i>Rastrelliger</i>	Freshwater fish
(2) Honeybee	<i>Apis</i>	Wax
(3) Mrigal	<i>Tacchardia</i>	Marinewater fish
(4) Silkworm	<i>Bombyx</i>	Mulberry silk



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Chapter 15 Circulation

1. Match the Columns :

I	II	III
(1) Lymphocyte	(a) Round and Large nucleus	(l) Antihistamine property
(2) Eosinophil	(b) Twisted nucleus	(m) Release heparin
(3) Basophil	(c) Bilobed nucleus	(n) Phagocytic
(4) Monocyte	(d) Kidney shaped nucleus	(o) Produce antibodies



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2. Match the Columns :

Location	Valve
(1) Opening of coronary sinus	(a) Tricuspid valve
(2) Base of pulmonary aorta	(b) Bicuspid valve
(3) Opening of inferior vena cava	(c) Semilunar valve
(4) Between left atrium and L.V.	(d) Thebesian valve
(5) Between right atrium and R.V.	(e) Eustachian valve



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3. Which of the following is correctly matched pair?

(a) Epicardium - epithelium

(b) Myocardium - mesothelium

(c) Endocardium - muscle fibres

(d) Epicardium - mesothellium



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Chapter 16 Excretion And Osmoregulation

1. Match the Columns :

Column A	Column B
(1) Ammonotelism	(a) Penguin
(2) Ureotelism	(b) Crow and sparrow
(3) Uricotelism	(c) Toad
(4) Guanotelism	(d) Tadpole of frog



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2. Match the Columns :

Part of nephron	Function
(1) Bowman's capsule	(a) Opens to calyx to pour urine
(2) PCT	(b) Secretion of hydrogen ions
(3) DCT	(c) Water and salt balance
(4) Loop of Henle	(d) Ultrafiltration
(5) Ducts of Bellini	(e) Amino acids and ions pumped out



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Chapter 17 Control And Coordination

1. Complete the table :

No.	Name	Type of nerve	Function
1	Optic nerve		
2	Facial		
3	Hypoglossal		
4	Trigeminal		
5	Auditory		
6	Glossopharyngeal		



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2. Complete the table given below by putting a tick (right) in the boxes where applicable.

No.	Action	Reflex	Voluntary
1	Touching a hot object		
2	Releasing saliva on smelling food		
3	Applying a car's brakes in an emergency		
4	Blinking of eyes when a small insect touches the eye		



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3. Complete the table :

No.	Types of Exteroceptors	Location	Function
1.	Touch corpuscles in skin	(1) Tangoreceptors- Pressure (2) Tactile receptors- Touch
2.	Skin	(1) (2)
3.	Chemoreceptors	(1) (2)
4.	Statoacoustic receptors	(1) (2)
5.	Retina of the eye



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4. Match the Columns :

Column I	Column II
(1) Glucagon	(a) Adrenaline
(2) Neurohypophysis	(b) Acromegaly
(3) Somatotropins	(c) ADH
(4) Hypertension	(d) Islets of Langerhans



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5. Match the Columns :

Column I (Hormone)	Column II (Function)
(1) Gastrin	(a) Inhibition of gastric motility
(2) Secretin	(b) Stimulating pancreas and gall bladder
(3) CCK	(c) Formation of pancreatic juice
(4) GIPT	(d) Secretion of pepsinogen



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6. Match the Columns :

Column I	Column II
(1) Addison's disease	(a) Hyposecretion of GH
(2) Grave's disease	(b) Hypersecretion of corticoid
(3) Cushing's disease	(c) Hyposecretion of ACTH
(4) Gull's disease	(d) Hypersecretion of thyroid
(5) Simmond's disease	(e) Hyposecretion of thyroid



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7. Complete the table :

Gland	Hormone	Important function
(1)	TSH
(2)	Regulation of basal metabolic rate
(3)	Insulin
(4)	Masculinity
(5)	(1) (2)	Reproductive cycles of female
(6)	Parathormone



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Chapter 18 Human Reproduction

1. Match the columns :

Column A	Column B
(1) <i>Ephydatia</i>	(a) Fission
(2) <i>Hydra</i>	(b) Regeneration
(3) <i>Planaria</i>	(c) Budding
(4) <i>Amoeba</i>	(d) Gemmule formation



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2. Complete the Table :

No.	Embryonic state	No. of cells	Time after fertilization
(1)	1st cleavage		
(2)	3rd cleavage		
(3)	Morula		
(4)	Blastocyst		



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3. Match the Columns :

Column A	Column B
(1) Fluid of seminal vesicles	(a) Transfer of sperms
(2) Prostatic secretion	(b) Lubrication of vagina
(3) Fluid of Cowper's gland	(c) Reduction of vaginal acidity
(4) Penis	(d) Energy for sperms



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4. Match the Columns :

Column A	Column B
(1) ZIFT	(a) Unwanted pregnancy
(2) GIFT	(b) Test tube baby
(3) MTP	(c) Early embryo transferred
(4) IVF	(d) Donor's ovum transferred



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Chapter 19 Organisms And Environment Ii

1. Match the Columns :

Column A	Column B
(1) Mercury	(a) Headache, diarrhoea, chest pain
(2) Lead	(b) Hyperkeratosis, Liver cirrhosis
(3) Arsenic	(c) Bone deformation, testicular atrophy
(4) Cadmium	(d) Anaemia, convulsion



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2. Match the Columns :

Column I	Column II
(1) Competition	(a) Tapeworm and man
(2) Commensalism	(b) Lichen
(3) Mutualism	(c) Cattle egret and cattle
(4) Parasitism	(d) Lions and Leopards



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3. Match the Columns :

Species	Example
(1) Vulnerable	(a) Rhinoceros
(2) Rare	(b) Asiatic wild ass
(3) Indeterminate	(c) Great Indian Bustard
(4) Endangered	(d) Clouded leopard



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