

SAMPLE CONTENT

MHT-CET 2021

TRIUMPH

BIOLOGY

MULTIPLE CHOICE QUESTIONS

4558 MCQS

BASED ON STD. XII SYLLABUS 2020-21

Archaeopteryx is the connecting link between birds and reptiles. This transitional fossil provides palaeontological evidence that birds evolved from reptiles.



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MHT-CET TRIUMPH BIOLOGY MULTIPLE CHOICE QUESTIONS

Based on New Syllabus

Salient Features

- ☞ Includes chapters of Std. XII as per latest textbook of 2020.
- ☞ 4558 MCQs including questions from various competitive exams.
- ☞ Quick Review provided at the start of each chapter.
- ☞ Exhaustive subtopic wise coverage of MCQs.
- ☞ Includes MCQs from NEET (UG), NEET (Odisha) and MHT- CET (6th May, Afternoon) 2019.
- ☞ Various competitive examination questions updated till the latest year.

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Hints for relevant questions and Evaluation Test in PDF format.



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PREFACE

“Don’t follow your dreams; chase them!”- a quote by Richard Dumbrell is perhaps the most pertinent for one who is aiming to crack entrance examinations held after std. XII. We are aware of an aggressive competition a student appearing for such career-defining examinations experiences and hence wanted to create books that develop the necessary knowledge, tools and skills required to excel in these examinations.

For the syllabus of MHT-CET 2020, 80% of the weightage is given to the syllabus for XII standard while only 20% is given to the syllabus for XI standard (with inclusion of only selected chapters). Since there is no change on the syllabus for MHT-CET 2021 till the time when this book was going to be printed and taking the fact into consideration that the entire syllabus for std. XII Science has always been an integral part of MHT-CET syllabus, this book includes all the topics of std. XII Biology.

We believe that although the syllabus for Std. XII and MHT-CET is aligned, the outlook to study the subject should be altered based on the nature of the examination. To score in MHT-CET, a student has to be not just good with the concepts but also quick to complete the test successfully. Such ingenuity can be developed through sincere learning and dedicated practice.

Having thorough knowledge of theory and its applications is a prerequisite for solving MCQs of Biology. Students must know the important processes and mechanisms that formulate the basics of the chapter. Biology is conveyed using diagrams and figures; therefore, students should study and understand them well. Students should aim to study integrated concepts and relate them to their real life applications in order to visualize a clear map of the entire concept. It should be kept in mind that every single line of text has potential of generating several MCQs.

As a first step to master MCQ solving, students should start with elementary questions. Once a momentum is gained, complex MCQs with higher level of difficulty should be practised. Relevant questions from previous years as well as from other similar competitive exams should be solved to obtain an insight about plausible questions.

The competitive exams challenge understanding of students about subject by combining concepts from different chapters in a single question. To figure these questions out, cognitive understanding of the subject is required. Therefore, students should put in extra effort to practise such questions.

Such a holistic preparation is the key to success in the examination!

To quote Dr. A.P.J. Abdul Kalam, “You want to shine like a sun, first burn like a sun.”

Our Triumph Biology book has been designed to achieve the above objectives. Commencing from basic MCQs the book proceeds to develop competence to solve complex MCQs. It offers ample practice of recent questions from various competitive examinations. While offering standard solutions in the form of concise hints. Each chapter ends with a self-evaluative test to allow self-assessment.

Features of the book presented on the next page will explicate more about the same!

We hope this book benefits the learner as we have envisioned.

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we’ve nearly missed something or want to applaud us for our triumphs, we’d love to hear from you.

Please write to us on: mail@targetpublications.org

Best of luck to all the aspirants!

From,
Publisher

Edition: First

FEATURES



Quick Review

DNA Packaging

In Prokaryotes

HU (Histone like DNA binding proteins) proteins and enzymes like DNA gyrase and DNA topoisomerase I

In Eukaryotes

Histone and Non-histone chromosomal proteins

Quick Review

Quick Review includes tables, flow charts to summarize the key points in the chapter.

This is our attempt to help students to reinforce key concepts.

Classical Thinking

Classical Thinking section encompasses straight forward questions including knowledge based questions.

This is our attempt to revise the chapter in its basic form and warm up the students to deal with complex MCQs.



Classical Thinking



3.1 Mendelian Genetics

1. The transmission of genetic information from parental generation to next generation is known as
(A) hybridization (B) heredity
(C) crossing over (D) variation



Critical Thinking



1. Nervous Co-ordination in Lower Animals

1. Which of the following is INCORRECT regarding nervous system of *Hydra*?
(A) It shows diffused nervous system.
(B) It is the most primitive nervous system.
(C) It consists of sensory cells and nerve cells.
(D) It has well developed central nervous system.

Critical Thinking

Critical Thinking section encompasses challenging questions which test understanding, rational thinking and application skills of the students.

This is our attempt to take the students from beginner to proficient level in smooth steps.

FEATURES

Competitive Thinking

Competitive Thinking section encompasses questions from various competitive examinations like MHT CET, AIPMT/NEET-UG, etc.

This is our attempt to give the students practice of competitive questions and advance them to acquire knack essential to solve such questions.



Competitive Thinking



5.2 Chemical Evolution of Life

1. The first cell or primitive cells were [MHT CET 2015]
- (A) marine and heterotrophic
 - (B) terrestrial and autotrophic
 - (C) marine and autotrophic
 - (D) terrestrial and heterotrophic

Subtopics

- 1.1 Asexual Reproduction
- 1.2 Sexual Reproduction
- 1.3 Microsporogenesis
- 1.4 Structure of Antrypous Ovule
- 1.5 Megasporogenesis

Subtopic wise segregation

Every section is **segregated sub-topic wise**.

This is our attempt to cater to individualistic pace and preferences of studying a chapter and enabling easy assimilation of questions based on the specific concept.

Miscellaneous

The **Miscellaneous** section incorporates MCQs whose solutions require knowledge of concepts covered in different sub-topics of same chapter or from different chapters.

This is our attempt to develop cognitive thinking in the students essential to solve questions involving fusion of multiple key concepts.

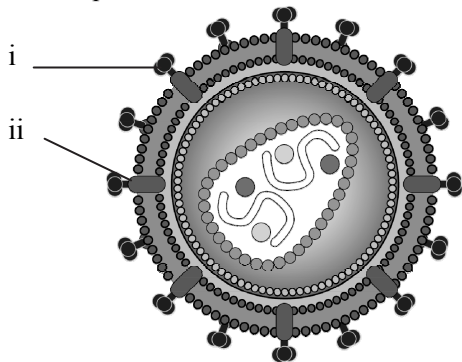


Miscellaneous

75. Read the following statements with respect to gene library and select the correct option.
- i. Gene library is a collection of different DNA sequences from an organism where each sequence has been cloned into a vector.
 - ii. Gene library is created for ease of purification, storage and analysis of desired genes.
- (A) Statement i is correct whereas statement ii is incorrect.
 - (B) Statement ii is correct whereas statement i is incorrect.
 - (C) Both statements i and ii are incorrect.
 - (D) Both statements i and ii are correct.

FEATURES

41. Identify the labels i and ii in the given diagram of HIV particle.



- (A) i – gp120, ii – gp 41
(B) i – Capsid protein, ii – gp 41
(C) i – gp 120, ii – Capsid protein
(D) i – gp 41, ii – gp120

Diagram Based Questions

Diagram based questions include challenging questions based on important diagrams / figures in the chapter.

This is an attempt to facilitate students' conceptual understanding and enhance their critical thinking ability.

Evaluation test

Evaluation Test covers questions from the chapter for self-evaluation purpose.

This is our attempt to provide the students with a practice test and help them assess their readiness of preparation of the chapter.



Evaluation Test

12. During pregnancy test, _____ is detected in the urine.
- (A) LH (B) hCG
(C) FSH (D) ACTH

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Disclaimer

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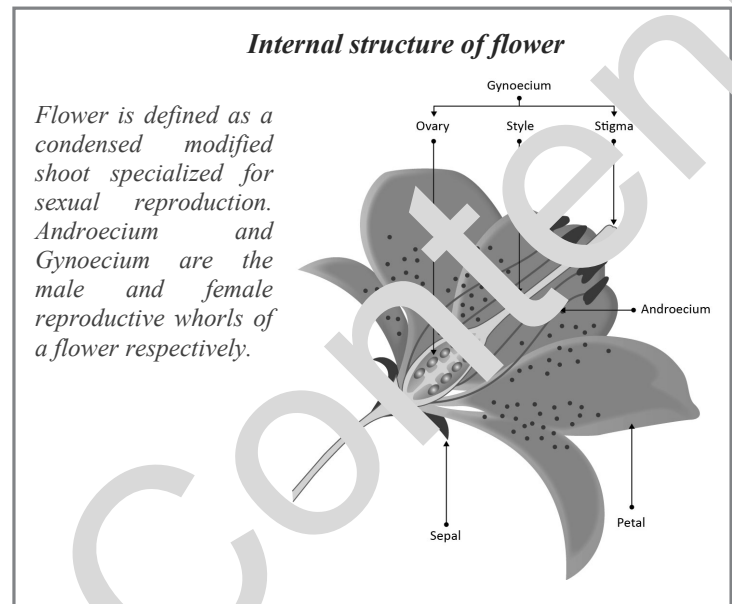
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Reproduction in Higher and Lower Plants

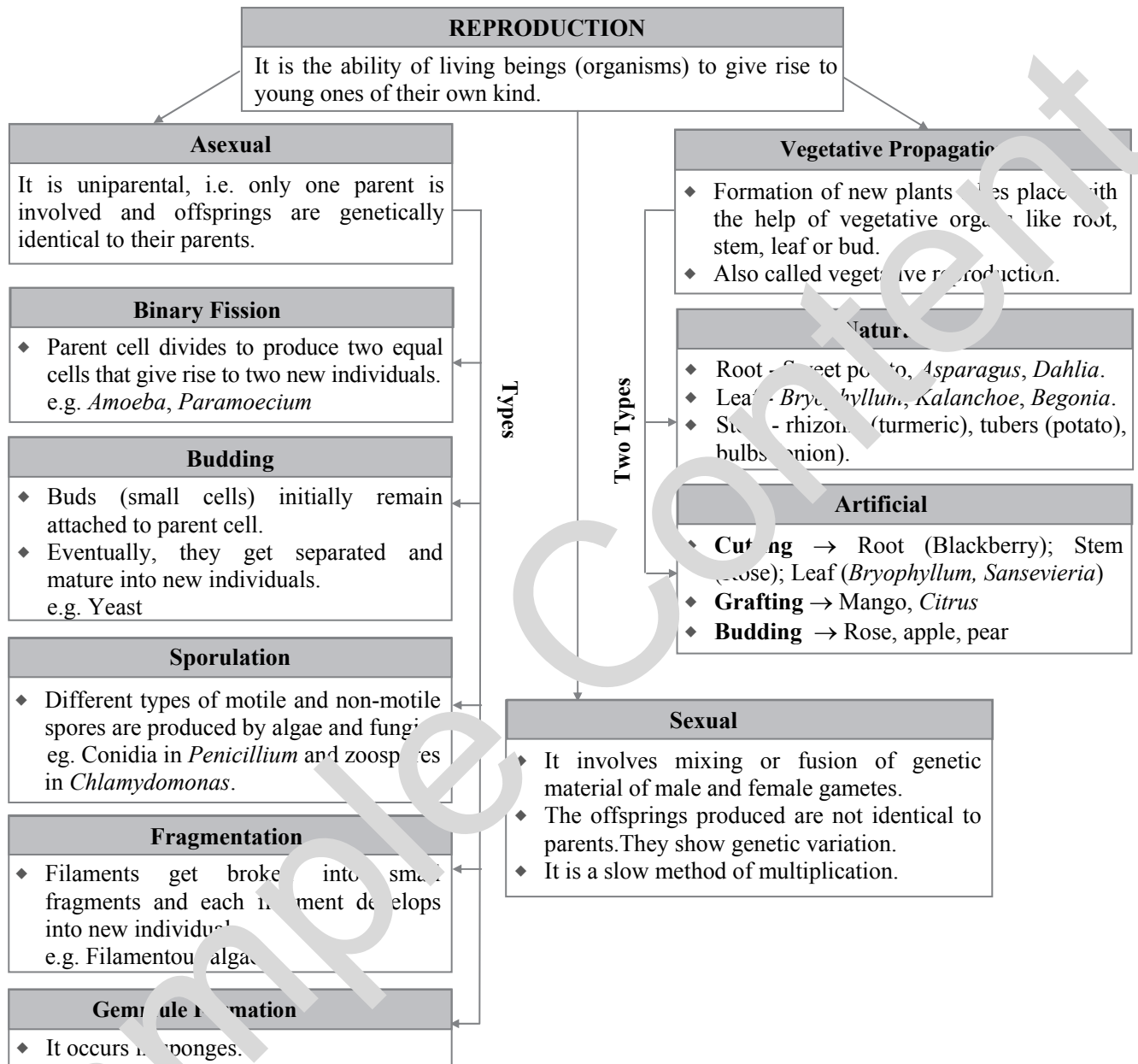
Subtopics

- 1.1 Asexual Reproduction
- 1.2 Sexual Reproduction
- 1.3 Microsporogenesis
- 1.4 Structure of Anotropous Ovule
- 1.5 Megasporogenesis
- 1.6 Pollination
- 1.7 Outbreeding Devices (Contrivances)
- 1.8 Pollen-Pistil Interaction
- 1.9 Double Fertilization
- 1.10 Development of Endosperm
- 1.11 Development of Embryo
- 1.12 Seed and Fruit Development
- 1.13 Apomixis
- 1.14 Parthenocarpy
- 1.15 Polyembryony





Quick Review





SEXUAL REPRODUCTION IN FLOWERING PLANTS

It is the process of development of new plants by the fusion of male and female gametes.

Flower

It is a condensed modified shoot specialized for sexual reproduction in plants.

Androecium

- It is the male reproductive whorl of a flower.
- It is made up of stamens.
- Stamens** → Filament, Anther and Connective

Microsporangium

- The bilobed anther has 4 pollen sacs (Microsporangium).
- Each pollen sac contains diploid sporogenous cells which divide mitotically to form microspore mother cells.
- Each diploid microspore mother cell (2n) divides meiotically to form four haploid microspores (n) or pollen grains.

Male gametophyte

- The protoplast of pollen grain divides mitotically to form two unequal cells – a small generative cell and large vegetative (tube) cell.
- This is the 2-celled male gametophyte.
- Further development is completed on the stigma after pollination.

Pollination

- It is the transfer of pollen grains (2-celled stage) from anther to the stigma of a flower by means of pollinating agencies.
- Two types** → Self pollination (Autogamy), Cross pollination (Allogamy)
- Various pollinating agencies** → Wind (Anemophily), Water (Hydrophily), Insects (Entomophily), Birds (Ornithophily), Bats (Chiropterophily).

Post fertilization changes

- After fertilisation, a series of changes take place inside the ovule.
- Ovule (Megasporangium) → Seed
 - Ovary (Carpel) → Fruit
 - Egg cell → Embryo
 - Secondary nucleus → Endosperm
 - Ovary wall → Pericarp
 - Outer integument → Testa
 - Inner integument → Tegmen

Gynoecium

- It is the female reproductive whorl of a flower.
- It is made up of carpels.
- Carpels** → Ovary, Style, Stigma

Megasporangium

- Ovule is the integumented megasporangium.
- One of the archisporial cells acts as megaspore mother cell and undergoes meiosis to form 4 haploid megaspores.
- Out of these upper 3 (towards micropylar end) degenerate and only the basal one (towards chalazal end) remains functional.

Female gametophyte

- The functional megaspore undergoes three successive mitotic divisions to form 8-nucleated (7-celled) female gametophyte.
- 2 Synergids, 1 Egg cell, 1 Secondary nucleus, 3 Antipodal cells → Female gametophyte.

Fertilization

- After pollination, pollen grains germinate on the stigma.
- Intine of the pollen grain comes out to form the pollen tube through the germ pore.
- Generative cell of pollen grain divides by mitosis to form, 2 haploid male gametes.
- The pollen tube enters the embryo sac through micropyle (Porogamy) or integuments (mesogamy) or chalaza (chalazogamy).
- The two haploid non-motile male gametes are brought upto the female gametophyte by means of pollen tube (Siphonogamy).
- The pollen tube burst inside the embryo sac releasing the two male gametes.
- One male gamete (n) fuses with the egg (n) to form diploid zygote (2n) → 1st Fertilization (Syngamy)
- Other male gamete (n) fuses with secondary nucleus (2n) to form Primary Endospermic Nucleus (3n) → 2nd Fertilization (Triple fusion).
- Double fertilization = Syngamy + Triple fusion.



Types of endosperm

Nuclear Cellular Helobial

Types of Seeds

Endospermic/ Albuminous
e.g. Caster, Coconut, Maize

Non-endospermic/ Ex-albuminous
e.g. Pea, bean

Apomixis

Formation of embryo(s)
through asexual method of reproduction

Categories

Recurrent Non-recurrent Adventive
Embryony

Parthenocarp

Fruits develop without fertilization

Polyembryony

Development of more than one embryos in seed



Classical Thinking



1.1 Asexual reproduction

- The main modes of reproduction in angiosperms are
 - vegetative propagation, sexual reproduction
 - sexual reproduction, parthenogenesis
 - vegetative propagation, gemmule formation
 - asexual reproduction, fragmentation
- Morphologically and genetically identical individuals produced by asexual reproduction are called as
 - Microspores
 - Clones
 - Embryos
 - Megaspores
- The most common type of asexual reproduction in filamentous algae is
 - binary fission
 - budding
 - fragmentation
 - sporulation
- A type of asexual reproduction in a unicellular organism in which parent cell divides to produce two equal cells which develop into two new individuals is called
 - budding
 - binary fission
 - sporulation
 - fragmentation
- Which of the following organisms show binary fission mode of reproduction?
 - Hydra, Yeast
 - Penicillium*, VAM
 - Paramecium*, *Amoeba*
 - Chlamydomonas*, sponges
- Penicillium* produce non-motile spores called
 - gemmae
 - conidia
 - fragments
 - bud
- Gemmule formation is commonly seen in
 - Amoeba*
 - Paramecium*
 - Sponges
 - Algae
- The asexual reproduction in angiosperm occurs naturally through vegetative parts such as root, stem, leaf or buds. Such type of reproduction is called
 - vegetative propagation
 - fragmentation
 - syngamy
 - binary fission
- A technique of vegetative propagation in which small piece of any vegetative part of a plant having one or more buds is used to develop a new plant is called
 - cloning
 - cutting
 - stocking
 - all of the above



10. An artificial method which involves joining the parts of two different plants in such a way that they unite and continue their growth as one plant is called
(A) grafting
(B) fragmentation
(C) cutting
(D) micropropagation
11. A technique of grafting in which a single bud with a small part of bark and living tissue is grafted on the particular stock is called
(A) cutting (B) bud grafting
(C) cloning (D) stocking

1.2 Sexual reproduction

12. _____ is the initial stage of the sporophyte.
(A) Haploid zygote
(B) Diploid zygote
(C) Haploid microspores
(D) Haploid megaspores
13. Flower is a highly modified and condensed reproductive shoot specially meant for
(A) vegetative reproduction
(B) sexual reproduction
(C) asexual reproduction
(D) parthenocarpic reproduction
14. The arrangement of whorls from outer to inner side in a flower are
(A) calyx, gynoecium, androecium, corolla
(B) calyx, corolla, androecium, gynoecium
(C) corolla, calyx, androecium, gynoecium
(D) gynoecium, androecium, corolla, calyx
15. Individual members of an androecium are called as
(A) stamens (B) filaments
(C) style (D) stamina
16. Fertile part of a stamen is
(A) filament (B) anther
(C) connective (D) both (B) and (C)
17. Two anther lobes are connected to each other by
(A) tapetum (B) pollen sacs
(C) connective (D) endothecium
18. Each monothecous anther contains _____ pollen sac/s.
(A) three (B) four
(C) two (D) one
19. Ditheous anther is
(A) monosporangiate (B) bisporangiate
(C) trisporangiate (D) tetrasporangiate
20. _____ is the outermost layer of anther which is protective in function.
(A) Epidermis (B) Endothecium
(C) Tapetum (D) Pollen sac

21. Endothecium layer of anther lobes is present
(A) outside the epidermis
(B) inner to epidermis
(C) in the innermost region
(D) in the middle region
22. Generally in the wall of the anther lobes, how many middle layers are present?
(A) Seven to eight (B) One to two
(C) Ten to twelve (D) Nine to ten
23. _____ is the inner most nutritive layer of anther wall.
(A) Tapetum (B) Endothecium
(C) Middle layer (D) Epidermis
24. In an immature anther, inner to the tapetum, the microsporangium contains a compact mass of
(A) haploid sporogenous tissue
(B) diploid sporogenous tissue
(C) triploid sporogenous tissue
(D) tetraploid sporogenous tissue

1.3 Microsporogenesis

25. Formation of pollen grains is known as
(A) pollination
(B) syngamy
(C) microsporogenesis
(D) megasporogenesis
26. Microsporogenesis takes place inside
(A) pollen grain (B) microsporangia
(C) endothecium (D) tapetum
27. Meiosis can be observed in
(A) cells of middle layer
(B) microspore mother cells
(C) microspores
(D) anther wall
28. Each pollen grain is
(A) multicellular, binucleate, spherical structure
(B) unicellular, uninucleate, spherical or oval, haploid structure
(C) multicellular, uninucleate, oval, diploid structure
(D) unicellular, binucleate, spherical, haploid structure.
29. The double layer wall of pollen grain is called
(A) exine (B) intine
(C) sporoderm (D) epiderm
30. The thick, highly resistant outer layer of pollen wall is called
(A) exine (B) intine
(C) endothecium (D) tapetum
31. Exine is interrupted at one or more places, called as
(A) megaspore (B) germ pore
(C) microspore (D) tube pore



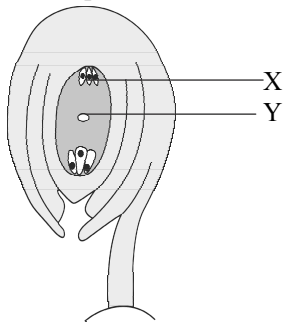
32. The intine of a pollen grain is made up of
 (A) cellulose and pectin
 (B) lipid and protein
 (C) pectin and lignin
 (D) lignin and cutin
33. The development of male gametophyte is
 (A) exosporic only
 (B) endosporic only
 (C) both exosporic and endosporic
 (D) either exosporic or endosporic
34. Before pollination, protoplast of pollen grain undergoes _____ to form two unequal cells.
 (A) mitosis
 (B) meiosis
 (C) both mitosis and meiosis
 (D) none of these
35. In the pollen grain before pollination, the smaller cell formed after mitotic division is called
 (A) tube cell (B) generative cell
 (C) germ cell (D) stalk cell
36. Larger cell of pollen grain formed before pollination is called
 (A) generative cell (B) vegetative cell
 (C) prothialial cell (D) stalk cell
37. Generative cell of a microspore undergoes which type of division?
 (A) Mitosis (B) Meiosis
 (C) Endomitosis (D) Budding
38. Male gametes are formed from
 (A) stalk cell (B) tube cell
 (C) prothialial cell (D) generative cell
39. In most of the angiosperms, pollen grains are released at
 (A) 4-celled stage (B) 2-celled stage
 (C) 3-celled stage (D) pollen tube stage
40. 3-celled stage of the male gametophyte representing fully formed mature male gametophyte, is reached
 (A) before pollination
 (B) after pollination
 (C) during fertilization
 (D) after fertilization
41. Pollen tube is formed from
 (A) pollen wall (B) callose layer
 (C) exine (D) intine
42. Generally, in a pollen tube, _____ moves to the tip of the tube.
 (A) generative nucleus
 (B) tube nucleus
 (C) male gametes
 (D) stalk cell

1.4 Structure of Anotropous ovule

43. Flower in which gynoecium possesses many free carpels is called as
 (A) Apocarpous (B) Uniovulate
 (C) Syncarpous (D) Multiovulate
44. Which of the following possesses multi-ovulated ovary?
 (A) Paddy (B) Tomato
 (C) Wheat (D) Mango
45. Funiculus attaches to an ovule with tissue of ovary called
 (A) placenta (B) integument
 (C) nucellus (D) perisperm
46. A type of ovule in which micropyle is directed downwards and is present adjacent to the funiculus is called
 (A) anatropous (B) campylotropous
 (C) circinotropous (D) amphitropous
47. Stalk of ovule is called
 (A) pedicel (B) peduncle
 (C) funicle (D) petiole
48. Nucellus consists of
 (A) parenchyma (B) collenchyma
 (C) sclerenchyma (D) perisperm
49. The base of the ovule is called
 (A) chalaza (B) raphae
 (C) micropyle (D) placenta
50. Protective covering of nucellus which develops from the chalazal part of nucellus is called
 (A) integuments (B) embryo sac
 (C) micropyle (D) chalaza
51. The narrow opening of integuments at the terminal end of nucellus is called
 (A) funicle (B) embryo sac
 (C) micropyle (D) chalaza
52. In a mature ovule, nucellus shows the presence of an oval shaped, haploid structure at micropylar end called
 (A) embryo sac (B) chalaza
 (C) funicle (D) nucellus
53. In an anatropous ovule, antipodal cells are present towards the
 (A) micropylar region
 (B) chalazal region
 (C) egg
 (D) central cell



54. Identify labels 'X' and 'Y' in the given diagram of an anatropous ovule.



- (A) X- Egg; Y- Male gamete
 (B) X- Synergid; Y- Egg cell
 (C) X- Antipodals; Y-Secondary nucleus
 (D) X- Nucellus; Y- Male gamete
55. Integument
 (A) gives protection to nucellus and embryo sac
 (B) after fertilization converted into seed coats
 (C) provides nutrition to the embryo sac
 (D) both (A) and (B)
56. Tegmen develops from
 (A) outer integuments
 (B) inner integuments
 (C) chalaza
 (D) perisperm
57. _____ forms the passage for the entry of pollen tube in ovule during fertilization.
 (A) Micropyle (B) Integument
 (C) Nucellus (D) Egg apparatus
58. _____ in the egg apparatus play supportive role and degenerate after fertilization.
 (A) Antipodals (B) Polar nuclei
 (C) Synergids (D) Nucellus

1.5 Megasporogenesis

59. Formation of megaspores is called as
 (A) microsporogenesis
 (B) megasporogenesis
 (C) sporogamy
 (D) chlamzogamy
60. The first cell of female gametophyte is
 (A) megaspore
 (B) microspore
 (C) megaspore mother cell
 (D) microspore mother cell
61. Where does meiosis occur in an ovule?
 (A) Megaspore mother cell
 (B) Integument
 (C) Megaspore
 (D) Archegonium

62. In angiosperms, the arrangement of megaspores in a tetrad is
 (A) decussate (B) tetrahedral
 (C) linear (D) isobilateral
63. The 3-celled egg apparatus at the micropylar end comprises of
 (A) egg cell and male gamete
 (B) synergids and polar bodies
 (C) egg and synergids
 (D) egg and antipodals
64. Synergids show hair like projection called as
 (A) antipodal
 (B) filiform apparatus
 (C) tegmen
 (D) funicle
65. The female gametophyte (*Fernogonum* type) at the time of fertilization
 (A) 4-nucleated and 4-celled
 (B) 8-nucleated and 8-celled
 (C) 8-nucleated and 7-celled
 (D) 8-nucleated and 8-celled

1.6 Pollination

66. The process of transfer of pollen grains from anther to the stigma of flower is called
 (A) fertilization (B) pollination
 (C) crossing over (D) transformation
67. Self-pollination means
 (A) occurrence of male and female sex organs in the same flower.
 (B) germination of pollens within the anther.
 (C) transfer of pollens from anther to the stigma within same flower.
 (D) transfer of pollens from anther of a flower to the stigma of another flower produced on different plant.
68. Pollination between different flowers on the same plant is
 (A) xenogamy (B) anemophily
 (C) geitonogamy (D) cleistogamy
69. The transfer of pollen grains from anther of a flower to the stigma of another flower produced on a different plant belonging to the same species is called
 (A) autogamy (B) geitonogamy
 (C) xenogamy (D) syngamy
70. Which of the following are abiotic agents of pollination?
 (A) Wind, water (B) Insects, birds
 (C) Bees, bats (D) both (B) and (C)



71. The transfer of pollen grains through wind is described as
 (A) hydrophily (B) anemophily
 (C) entomophily (D) ornithophily
72. Anemophilous flowers are
 (A) small, inconspicuous without bright colours, fragrance and nectar.
 (B) large with bright colours and pleasant fragrance.
 (C) large with thick and fleshy floral whorls.
 (D) large and stout.
73. Largest amount of pollen is produced by plants which show pollination by
 (A) birds (B) animal
 (C) wind (D) water
74. Which of the following characteristic is a wind pollinated flower likely to have?
 (A) Large coloured flowers
 (B) Fragrance
 (C) Feathery stigmas
 (D) Heavy spiny pollen
75. Stamens with long filaments and versatile, exposed anthers are seen in
 (A) hydrophilous flowers
 (B) entomophilous flowers
 (C) anemophilous flowers
 (D) ornithophilous flowers
76. Which of the following is NOT an anemophilous plant?
 (A) Wheat (B) Maize
 (C) Barley (D) *Ceratophyllum*
77. The transfer of pollen grains through the agency of water is called
 (A) anemophily (B) entomophily
 (C) hydrophily (D) ornithophily
78. Adaptation shown by pollen grain by hydrophilous flowers is
 (A) hair, exine on pollen grains
 (B) mucilage coat on pollen grains
 (C) heavy weight pollen grains
 (D) winged pollen grains
79. Which of the following floral adaptations are adaptations of hydrophilous flowers?
 (A) Flowers are small and inconspicuous.
 (B) Flowers are without fragrance and nectar.
 (C) Perianth and other floral parts are unwettable.
 (D) All of the above
80. Pollination taking place below the surface of water in hydrophytes bearing submerged female flowers is called
 (A) hypohydrophily (B) epihydrophily
 (C) anemophily (D) entomophily
81. When pollination occurs on the surface of water it is called
 (A) hypohydrophily (B) epihydrophily
 (C) anemophily (D) ornithophily
82. _____ flowers produce ribbon-like pollen grains without exine.
 (A) Anemophilous
 (B) Entomophilous
 (C) Ornithophilous
 (D) Hypohydrophilous
83. In *Ceratophyllum*, pollination is
 (A) hydrophilous
 (B) chiropterophilous
 (C) entomophilous
 (D) anemophilous
84. In *Vallisneria*, pollination occurs
 (A) on surface of water
 (B) below surface of water
 (C) through wind
 (D) deep in water.
85. Pollination through the agency of insects is known as
 (A) entomophily (B) ornithophily
 (C) hydrophily (D) anemophily
86. Bright coloured flower is an adaptation for
 (A) zoophily (B) hydrophily
 (C) entomophily (D) anemophily
87. In Rose, Jasmine and *Cestrum* pollination is carried out by
 (A) air (B) water
 (C) insects (D) birds
88. Bird pollination is
 (A) entomophily (B) anemophily
 (C) hydrophily (D) ornithophily
89. Find the odd pair from the following.
 (A) Anemophily – wind
 (B) Hydrophily – water
 (C) Ornithophily – insect
 (D) Chiropterophily – bat
90. Which of the following is/are an ornithophilous plant/s?
 (A) *Bombax*
 (B) *Callistemon* (Bottle Brush)
 (C) *Butea*
 (D) All of these
91. Chiropterophily is the pollination carried out by
 (A) insect (B) bat
 (C) birds (D) animals
92. _____ plants are nocturnal and open their flower during night.
 (A) Chiropterophilous (B) Entomophilous
 (C) Ornithophilous (D) Hydrophilous



93. Which of the following involves comparatively greater wastage of pollen?
(A) Ornithophily (B) Anemophily
(C) Entomophily (D) Chiropterophily

1.7 Outbreeding devices (contrivances)

94. Which of the following is/are outbreeding device/s that prevent/s self-pollination?
(A) Unisexuality (B) Protogyny
(C) Protandry (D) All of these
95. Protogyny is a condition in which
(A) gynoecium matures earlier than the androecium.
(B) androecium matures earlier than the gynoecium.
(C) both androecium and gynoecium mature at the same time.
(D) gynoecium remains sterile and fruit formation does not occur.
96. When the anthers mature earlier than the stigma in the same flower, the condition is known as
(A) herkogamy (B) protandry
(C) heterostyly (D) dichogamy
97. In primrose, there are two or three types of flowers in which stigmas and anthers are placed at different levels, this condition is called
(A) protogyny (B) dichogamy
(C) heterostyly (D) herkogamy
98. A genetic mechanism due to which the germination of pollen on stigma of same flower is inhibited is called
(A) self-sterility
(B) heterostyly
(C) self-incompatibility
(D) both (A) and (C)

1.8 Pollen-pistil interaction

99. Events from deposition of pollen grain on the stigma to the entry of pollen tube in the ovule are called
(A) propagation
(B) fertilization
(C) pollen-pistil interaction
(D) self-incompatibility
100. In the process of pollination in angiosperms, the receptive part in the flower receives
(A) male gametes (B) pollen tube
(C) pollen grains (D) insects
101. After a successful germination, the tip of the pollen tube enters in one of the _____ and then ruptures to release the contents.
(A) synergids (B) antipodals
(C) eggs (D) polar nuclei

102. _____ induces pollen germination and tube growth *in vitro*.
(A) Conc. H₂SO₄ (B) Sucrose
(C) Abscisic acid (D) Dilute HCl

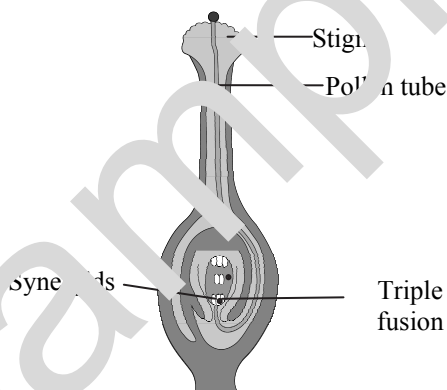
103. In _____ only desired pollen grains are hand pollinated and used for fertilization.
(A) hybridization
(B) self-incompatibility
(C) vegetative propagation
(D) asexual reproduction

1.9 Double fertilization

104. Double fertilization is a characteristic of
(A) Gymnosperms (B) Bryophytes
(C) Angiosperms (D) Pteridophytes
105. When pollen tube enters through micropyle, it is known as
(A) mesogamy (B) siphonogamy
(C) porogamy (D) chalazogamy
106. Complete the given analogy by selecting the correct option.
Entry of pollen tube through _____
Chalazogamy :: Integuments: _____
(A) Syngamy (B) Porogamy
(C) Siphonogamy (D) Mesogamy
107. A pollen tube always enters the embryo sac near the
(A) egg apparatus (B) antipodals
(C) secondary nucleus (D) chalaza
108. The fertilization process in which non-motile male gametes are transported upto the female gamete through a pollen tube is called
(A) syngamy (B) siphonogamy
(C) chalazogamy (D) mesogamy
109. Syngamy means
(A) fusion of similar spores
(B) fusion of dissimilar spores
(C) fusion of cytoplasm
(D) fusion of gametes
110. Syngamy results in
(A) diploid zygote
(B) triploid zygote
(C) diploid endosperm
(D) triploid endosperm
111. In double fertilization, the first male gamete fuses with egg and second male gamete fuses with
(A) PEN
(B) secondary nucleus
(C) zygote
(D) antipodal cells



112. Triple fusion means, fusion of
 (A) two antipodals with male gametes
 (B) two eggs with a male gamete
 (C) two male gametes with one egg
 (D) one male gamete with secondary nucleus
113. In angiosperm, triple fusion is necessary for the formation of
 (A) seed coat (B) fruit wall
 (C) embryo (D) endosperm
114. In angiosperms, triple fusion results in the formation of
 (A) primary endosperm nucleus
 (B) zygotic nucleus
 (C) secondary nucleus
 (D) polar nucleus
115. Real function of the 'endosperm' is to
 (A) supply nutrition to the growing embryo
 (B) form integuments of ovule
 (C) form funicle of ovule
 (D) none of these
116. Select the INCORRECT statement from the following with respect to double fertilization.
 (A) Syngamy is a type of generative fertilization.
 (B) Triple fusion is a type of vegetative fertilization.
 (C) The growth of pollen tube is guided by the chemicals secreted by the antipodal cells.
 (D) The zygote develops into an embryo
117. Identify the INCORRECT label in the following figure of double fertilization



- (A) Stigma (B) Triple fusion
 (C) Pollen tube (D) Synergids

1.10 Development of Endosperm

118. The primary endosperm nucleus undergoes free nuclear division or karyokinesis in
 (A) nuclear endosperm
 (B) cellular endosperm
 (C) helobial endosperm
 (D) none of these

119. In cellular endosperm,
 (A) the primary endosperm nucleus undergoes karyokinesis only.
 (B) the primary endosperm nucleus undergoes nuclear divisions which is immediately followed by cytokinesis.
 (C) the first division of primary endosperm nucleus is followed by incomplete wall formation.
 (D) the central cell is divided into a large micropylar and a small chalazal chamber.
120. Which of the following is the characteristic feature of helobial endosperm?
 (A) The first division of primary endosperm nucleus is followed by transverse wall formation.
 (B) The central cell is divided into a large micropylar and a small chalazal chamber.
 (C) It is common in Helobiales series of monocots.
 (D) All of the above
121. In coconut, the endosperm in the centre is
 (A) cellular (B) multicellular
 (C) free nuclear (D) helobial
122. Which of the following plant shows cellular type of endosperm?
 (A) Wheat (B) *Petunia*
 (C) *Asphodelus* (D) Sunflower



1.11 Development of Embryo

123. The process of development of zygote into an embryo is called
 (A) embryogenesis
 (B) karyokinesis
 (C) sporogenesis
 (D) parthenogenesis
124. During the development of embryo, the zygote forms a wall around itself and is converted into
 (A) oosphere (B) oospore
 (C) oogonia (D) oocyte
125. The oospore during embryonic development divides
 (A) transversely (B) horizontally
 (C) diagonally (D) vertically
126. The 2-celled stage of embryo is called as
 (A) suspensor (B) embryonal cell
 (C) proembryo (D) plumule
127. Role of suspensor is
 (A) to transport water to the embryo
 (B) helping in cell division
 (C) pushing the embryo in endosperm
 (D) all of these



128. During embryo development, the embryonal initial cell 2-celled pro-embryo undergoes a transverse and two vertical divisions at right angles to each other to form
(A) tetrad stage (B) octant stage
(C) triplet stage (D) none of these
129. The first cell of the suspensor towards the micropylar end becomes swollen and function as a
(A) hypocotyl (B) haustorium
(C) radicle (D) plumule
130. The lowermost cell of suspensor is known as
(A) hypocotyl (B) haustorium
(C) hypophysis (D) scutellum
131. The single shield shaped cotyledon in monocot is called as
(A) haustorium (B) perisperm
(C) coleoptile (D) scutellum
132. Fully developed embryo ultimately becomes
(A) globular shaped
(B) cordate shaped
(C) horse – shoe shaped
(D) kidney shaped



1.12 Seed and Fruit development

133. Which of the following shows post fertilization changes incorrectly?
(A) Ovary – Fruit
(B) Ovule – Seed
(C) Integuments – Perisperm
(D) Zygote – Embryo
134. Outer integument and inner integument of an ovule changes into
(A) seed and fruit respectively
(B) testa and tegmen respectively
(C) mesocarp and endocarp respectively
(D) seed and flower respectively
135. In some plants, nucellus in the ovule may persist and is known as
(A) scutellum (B) perisperm
(C) endosperm (D) tegmen
136. Ex-albuminous seeds differ from albuminous seeds
(A) not having endosperm
(B) not having embryo sac
(C) having endosperm
(D) having embryo sac
137. Which of the following are non-endospermic seeds?
(A) Castor, sunflower
(B) Coconut, maize
(C) Wheat, bajra
(D) Pea, bean

138. What is the function of micropyle in seed?
(A) Entry of water during germination
(B) Acts as a first photosynthetic organ
(C) Entry of oxygen during germination
(D) Both (A) and (C)
139. A true fruit is developed from _____.
(A) ovule
(B) thalamus and ovary
(C) ovary only
(D) calyx and ovary
140. At the time of fruit formation, ovary wall changes into
(A) endocarp (B) mesocarp
(C) epicarp (D) pericarp
141. All the given below are significance of seed and fruit formation, except
(A) Seeds and fruit develop special devices for their dispersal and thus help in the distribution of the species.
(B) Fruits protect the seeds in immature condition
(C) Fruits derive nutrition from developing seeds
(D) Seeds serve as important propagating organs (units) of plant.

142. _____ is a state of metabolic arrests that facilitates the survival of organisms during adverse environmental conditions.
(A) Dormancy (B) Viability
(C) Dispersal (D) Parthenocarpy
143. The functional ability of seeds to germinate after considerable dormancy period is called
(A) viability
(B) dispersal
(C) apomixis
(D) polyembryony



1.13 Apomixis

144. _____ is phenomenon of formation of embryo(s) through asexual method of reproduction without formation of gametes and the act of fertilization.
(A) Parthenocarpy
(B) Embryogenesis
(C) Polyembryony
(D) Apomixis
145. When diploid sporophyte cell produces a diploid gametophyte without undergoing meiosis is called
(A) apogamy
(B) autogamy
(C) apospory
(D) adventive polyembryony

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Competitive Thinking

1. (A) 2. (B) 3. (D) 4. (B) 5. (A) 6. (C) 7. (D) 8. (D) 9. (A) 10. (D)
 11. (D) 12. (A) 13. (C) 14. (C) 15. (D) 16. (C) 17. (A) 18. (A) 19. (A) 20. (A)
 21. (C) 22. (B) 23. (C) 24. (A) 25. (D) 26. (B) 27. (C) 28. (C) 29. (B) 30. (C)
 31. (B) 32. (D) 33. (B) 34. (A) 35. (D) 36. (D) 37. (C) 38. (C) 39. (C) 40. (C)
 41. (A) 42. (B) 43. (C) 44. (D) 45. (B) 46. (B) 47. (C) 48. (A) 49. (C) 50. (C)
 51. (B) 52. (A) 53. (D) 54. (D) 55. (B) 56. (C) 57. (C) 58. (D) 59. (B) 60. (A)
 61. (A) 62. (C) 63. (A) 64. (C) 65. (D) 66. (B) 67. (C) 68. (A) 69. (B) 70. (B)
 71. (D) 72. (C) 73. (D) 74. (B) 75. (C) 76. (D) 77. (D) 78. (C) 79. (C) 80. (A)
 81. (B) 82. (D) 83. (A) 84. (C) 85. (C) 86. (D) 87. (C)



Evaluation Test

- If the haploid number in a flowering plant is 14. What will be the number of chromosomes in integuments, antipodal cells, embryo, endosperm and nucellus respectively?
 (A) 14, 28, 7, 42, 21
 (B) 7, 14, 42, 28, 14
 (C) 28, 14, 28, 42, 28
 (D) 42, 28, 14, 28, 14
- Seeds are called products of sexual reproduction because they
 (A) are formed by fusion of gametes
 (B) give rise to new plants
 (C) can be stored for long time
 (D) are formed by fusion of pollen tubes
- Identify the mode of asexual reproduction shown in the diagram given below.

 (A) Fragmentation
 (B) Binary fission
 (C) Budding
 (D) Gemma formation
- Which of the following statement is true about tapetum?
 (A) It is the innermost wall layer.
 (B) It surrounds the sporogenous tissue of microsporangium.
 (C) It is nutritive in function.
 (D) All of the above
- Which of the following shows entomophilous pollination?
 (A) *Cestrum*, Lotus
 (B) *Adansonia*, Sausage tree
 (C) *Zostera*, *Vallisneria*
 (D) Maize, Jowar
- Which of the following statements regarding asexual reproduction are correct?
 (i) It is uniparental.
 (ii) The offspring produced are genetically identical to the parent.
 (iii) It is biparental.
 (iv) The offspring produced are not genetically identical to the parent.
 (A) (i) and (ii) are correct.
 (B) (iii) and (iv) are correct.
 (C) (ii) and (iii) are correct.
 (D) (i) and (iv) are correct.
- Self-incompatibility means
 (A) inhibition of pollen germination on the stigma of same flower.
 (B) inhibition of pollen germination on the stigma of different flower.
 (C) anther and stigma mature at different times
 (D) germination of pollens within the anther
- Find out the correct sequence of events taking place in pollen-pistil interaction.
 i. Pollen tube enters one of the synergids and bursts to release male gametes.
 ii. Pollen tube enters ovule through micropyle of ovary.
 iii. Pollen tube grows through the stigmatic tissue and then style.
 iv. Pistil recognizes the correct pollen and accepts it.
 (A) iv → iii → ii → i (B) iv → ii → iii → i
 (C) ii → iv → iii → i (D) iii → iv → ii → i
- Commonly in a mature fertilized ovule n , $2n$ and $3n$ condition is respectively found in
 (A) antipodals, synergids and integuments.
 (B) egg, endosperm and nucellus.
 (C) antipodals, zygote and endosperm.
 (D) endosperm, nucellus and egg.



10. Match the following ovular structure with the post-fertilization structure and select the correct alternative.

	Column I		Column II
i.	Nucellus	a.	Fruit
ii.	Egg	b.	Endosperm
iii.	Ovary	c.	Perisperm
iv.	Secondary nucleus	d.	Embryo

- (A) i – c; ii – d; iii – a; iv – b
 (B) i – a; ii – b; iii – d; iv – c
 (C) i – c; ii – b; iii – a; iv – d
 (D) i – d; ii – b; iii – c; iv – a
11. In angiosperms, the product of syngamy in double fertilization is
 (A) haploid (B) diploid
 (C) triploid (D) polyploid
12. The exact meaning of apomixis in plant is development of a plant
 (A) from root cuttings
 (B) without fusion of gametes
 (C) from fusion of gametes
 (D) from stem cuttings
13. The number of pollen grains, produced by 25 microspore mother cells is
 (A) 30 (B) 50
 (C) 80 (D) 100
14. Which of the following is male gametophyte?
 (A) Embryo sac
 (B) Antipodal cell
 (C) Megasporangium
 (D) Pollen grain with pollen tube
15. Female gametophyte in flowering plants develops after
 (A) 1 meiosis and 1 mitosis
 (B) 2 meiosis and 2 mitosis
 (C) 1 meiosis and 3 mitosis
 (D) 2 meiosis and 1 mitosis
16. When pollen tube enters the ovule through the micropyle, it is known as
 (A) syngamy (B) porogamy
 (C) chalazogamy (D) misogamy
17. Diploid plants can be obtained from culture of
 (A) Pollen (B) Endosperm
 (C) Ovule (D) Megaspore
18. *Bryophyllum* is multiplied vegetatively by
 (A) stem branch (B) leaves
 (C) roots (D) rhizome
19. The point of attachment of funicle with chalazal end is called
 (A) placenta (B) integument
 (C) nucellus (D) hilum

20. Which of the following is a character of Papaya plant to avoid autogamy?

(A) Unisexuality (B) Protogyny
 (C) Protandry (D) Heterostyly



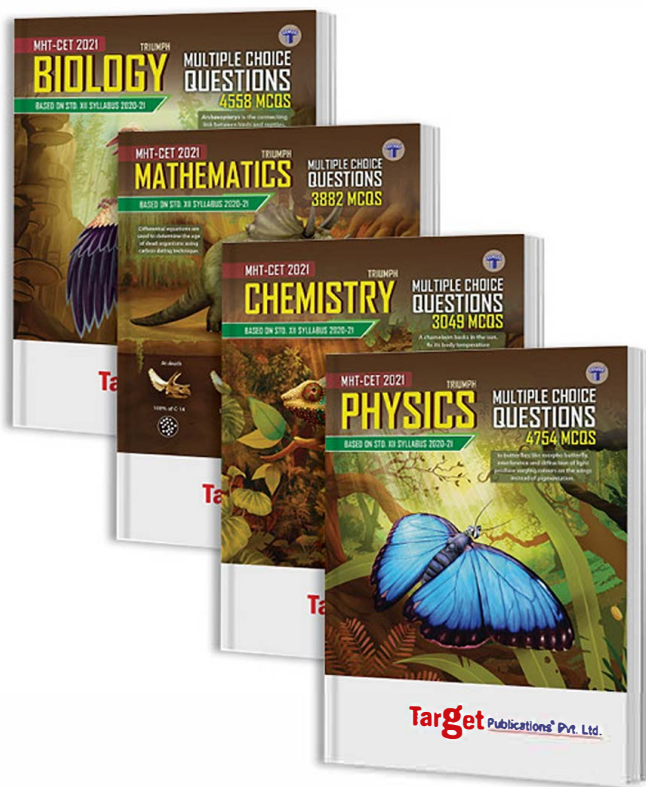
Answers to Evaluation Test

1. (C) 2. (A) 3. (B) 4. (D)
 5. (A) 6. (A) 7. (A) 8. (A)
 9. (C) 10. (A) 11. (B) 12. (B)
 13. (D) 14. (D) 15. (C) 16. (B)
 17. (B) 18. (B) 19. (D) 20. (C)

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