

## NEET CELL CYCLE AND CELL DIVISION — MEIOSIS I (PROPHASE I SUBSTAGES, CROSSING OVER) — PYQS

Max. Marks: 112

Questions: 28

### Section A (MCQ) — 28 questions

**Q.1** Given below are two statements:

**Statement-I:** Chromosomes are fully condensed at the end of prophase I.

**Statement-II:** Meiosis I resembles mitosis.

In the light of the above statements, choose the most appropriate answer from the options given below:

[RE-NEET (UG) 2026]

- (1) Statement-I is incorrect, but Statement-II is true
- (2) Both Statement-I and Statement-II are true
- (3) Both Statement-I and Statement-II are false
- (4) Statement-I is correct, but Statement-II is false

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**Q.2** Given below are two statements:

**Statement-I:** Chromosomes become gradually visible under light microscope during leptotene stage.

**Statement-II:** The beginning of diplotene stage is recognized by dissolution of synaptonemal complex.

In the light of the above statements, choose the correct answer from the options given below:

[NEET (UG) 2024]

- (1) Both Statement-I and Statement-II are true
- (2) Both Statement-I and Statement-II are false
- (3) Statement-I is true but Statement-II is false
- (4) Statement-I is false but Statement-II is true

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**Q.3** Match List I with List II :

| List - I<br>(Sub Phases of Prophase I) |            | List - II<br>(Specific Characters) |                                            |
|----------------------------------------|------------|------------------------------------|--------------------------------------------|
| A.                                     | Diakinesis | I.                                 | Synaptonemal complex formation             |
| B.                                     | Pachytene  | II.                                | Completion of terminalisation of chiasmata |
| C.                                     | Zygotene   | III.                               | Chromosomes look like thin threads         |

| List - I<br>(Sub Phases of Prophase I) |           | List - II<br>(Specific Characters) |                                     |
|----------------------------------------|-----------|------------------------------------|-------------------------------------|
| D.                                     | Leptotene | IV.                                | Appearance of recombination nodules |

Choose the correct answer from the options given below

[NEET (UG) 2024]

- (1) A-IV, B-II, C-III, D-I (2) A-I, B-II, C-IV, D-III  
(3) A-II, B-IV, C-I, D-III (4) A-IV, B-III, C-II, D-I

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**Q.4** Recombination between homologous chromosomes is completed by the end of

[RE-NEET (UG) 2024]

- (1) Diakinesis
- (2) Zygotene
- (3) Diplotene
- (4) Pachytene

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**Q.5** Match List-I with List-II.

| List - I<br>Event |                                | List - II<br>Stage of Prophase-I<br>(Meiosis-I) |            |
|-------------------|--------------------------------|-------------------------------------------------|------------|
| A.                | Chiasmata formation            | I.                                              | Pachytene  |
| B.                | Crossing over                  | II.                                             | Diakinesis |
| C.                | Synaptonemal complex formation | III.                                            | Diplotene  |
| D.                | Terminalisation of chiasmata   | IV.                                             | Zygotene   |

Choose the correct answer from the options given below :

[RE-NEET (UG) 2024]

- (1) A-III, B-I, C-IV, D-II (2) A-II, B-I, C-III, D-IV  
(3) A-III, B-I, C-II, D-IV (4) A-II, B-III, C-IV, D-I

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**Q.6** The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?

[NEET (UG) 2023]

- (1) Pachytene
- (2) Diplotene
- (3) Diakinesis
- (4) Zygotene

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**Q.7** Select the correct statements.  
Choose the correct answer from the options given below:

- A. Tetrad formation is seen during Leptotene.
- B. During Anaphase, the centromeres split and chromatids separate.
- C. Terminalization takes place during Pachytene.
- D. Nucleolus, Golgi complex and ER are reformed during Telophase.
- E. Crossing over takes place between sister chromatids of homologous chromosome.

[NEET (UG) 2023]

- (1) B and D only                      (2) A, C and E only
- (3) B and E only                      (4) A and C only

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**Q.8** The appearance of recombination nodules on homologous chromosomes during meiosis characterizes:

[NEET (UG) 2022]

- (1) Synaptonemal complex
- (2) Bivalent
- (3) Sites at which crossing over occurs
- (4) Terminalization

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**Q.9** Which stage of meiosis can last for months or years in the oocytes of some vertebrates?

[NEET (UG) 2022 (Phase 2)]

- (1) Diakinesis                      (2) Leptotene
- (3) Pachytene                      (4) Diplotene

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**Q.10** In meiosis, crossing over and exchange of genetic material between homologous chromosomes are catalyzed by the enzyme

[NEET (UG) 2022 (Phase 2)]

- (1) Polymerase                      (2) Phosphorylase
- (3) Recombinase                      (4) Transferase

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**Q.11** Identify the correct sequence of events during Prophase I of meiosis:

Choose the correct answer from the options given below:

- A. Synapsis of homologous chromosomes
- B. Chromosomes become gradually visible under microscope
- C. Crossing over between non-sister chromatids of homologous chromosomes
- D. Terminalisation of chiasmata
- E. Dissolution of synaptonemal complex

[NEET (UG) 2022 (Phase 2)]

- (1) A, C, D, E, B                      (2) A, B, C, D, E
- (3) B, C, D, E, A                      (4) B, A, C, E, D

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**Q.12** Bivalent or Tetrad formation is a characteristic feature observed during

[NEET (UG) 2022 (Phase 2)]

- (1) Chiasmata in zygotene stage
- (2) Synaptonemal complex in zygotene stage
- (3) Chiasmata in Diplotene stage
- (4) Synaptonemal complex in Pachytene stage

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**Q.13** Which stage of meiotic prophase shows terminalisation of chiasmata as its distinctive feature?

[NEET (UG) 2021]

- (1) Pachytene                      (2) Leptotene
- (3) Zygotene                      (4) Diakinesis

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**Q.14** Match the following with respect to meiosis

| List-I |            | List-II |                 |
|--------|------------|---------|-----------------|
| A.     | Zygotene   | i.      | Terminalization |
| B.     | Pachytene  | ii.     | Chiasmata       |
| C.     | Diplotene  | iii.    | Crossing over   |
| D.     | Diakinesis | iv.     | Synapsis        |

Select the correct option from the following

[NEET (UG) 2020]

- (1) (A)-(iv), (B)-(iii), (C)-(ii), (D)-(i)
- (2) (A)-(iii), (B)-(iv), (C)-(i), (D)-(ii)
- (3) (A)-(i), (B)-(ii), (C)-(iv), (D)-(iii)
- (4) (A)-(ii), (B)-(iv), (C)-(iii), (D)-(i)

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**Q.15** Dissolution of the synaptonemal complex occurs during

[NEET (UG) 2020]

- (1) Diplotene                      (2) Zygotene
- (3) Pachytene                      (4) Leptotene

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**Q.16** The stage during which separation of the paired homologous chromosomes begins is

[NEET 2018]

- (1) zygotene                      (2) pachytene
- (3) diplotene                      (4) diakinesis

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**Q.17** Which of the following is not a characteristic feature during mitosis in somatic cells?

[NEET 2016 (Phase 1)]

- (1) Chromosome movement
- (2) Synapsis
- (3) Spindle fibres
- (4) Disappearance of nucleolus

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**Q.18** In meiosis crossing over is initiated at

[NEET 2016 (Phase 1)]

- (1) zygotene (2) diplotene
- (3) pachytene (4) leptotene.

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**Q.19** Match the stages of meiosis in **column I** to their characteristic features in **column II** and select the correct option using the codes given below.

[NEET 2016 (Phase 2)]

| Column I |             | Column II |                                       |
|----------|-------------|-----------|---------------------------------------|
| a.       | Pachytene   | i.        | Pairing of homologous chromosomes     |
| b.       | Metaphase I | ii.       | Terminalisation of chiasmata          |
| c.       | Diakinesis  | iii.      | Crossing-over takes place             |
| d.       | Zygotene    | iv.       | Chromosomes align at equatorial plate |

- (1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
- (2) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
- (3) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
- (4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

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**Q.20** Arrange the following events of meiosis in correct sequence

[AIPMT 2015]

- (i) Crossing over
- (ii) Synapsis
- (iii) Terminalisation of chiasmata
- (iv) Disappearance of nucleolus

- (1) (i), (ii), (iii), (iv) (2) (ii), (iii), (iv), (i)
- (3) (ii), (i), (iv), (iii) (4) (ii), (i), (iii), (iv)

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**Q.21** The enzyme recombinase is required at which stage of meiosis?

[AIPMT 2014]

- (1) Pachytene (2) Zygotene
- (3) Diplotene (4) Diakinesis

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| Column I |                                                                        | Column II |                       |
|----------|------------------------------------------------------------------------|-----------|-----------------------|
| A.       | Synapsis aligns homologous chromosomes                                 | i.        | Anaphase II           |
| B.       | Synthesis of RNA and protein                                           | ii.       | Zygotene              |
| C.       | Action of enzymes recombinase                                          | iii.      | G <sub>2</sub> -phase |
| D.       | Centromeres do not separate but chromatids move towards opposite poles | iv.       | Anaphase I            |
|          |                                                                        | v.        | Pachytene             |

**Q.22** Select the correct option. [AIPMT 2015 (Cancelled)]

- (1) (A) - (i); (B) - (ii); (C) - (v); (D) - (iv)
- (2) (A) - (ii); (B) - (iii); (C) - (iv); (D) - (v)
- (3) (A) - (ii); (B) - (i); (C) - (iii); (D) - (iv)
- (4) (A) - (ii); (B) - (iii); (C) - (v); (D) - (iv)

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**Q.23** The complex formed by a pair of synapsed homologous chromosomes is called [NEET 2013]

- (1) bivalent (2) axoneme
- (3) equatorial plate (4) kinetochore.

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**Q.24** During meiosis I, the chromosomes start pairing at

[NEET 2013 (Karnataka)]

- (1) zygotene (2) pachytene
- (3) diplotene (4) leptotene.

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**Q.25** Identify the meiotic stage in which the homologous chromosomes separate while the sister chromatids remain associated at their centromeres.

[AIPMT 2012 (Mains)]

- (1) Metaphase I (2) Metaphase II
- (3) Anaphase I (4) Anaphase II

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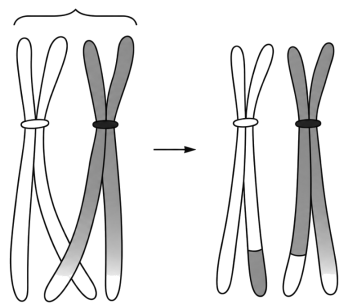
**Q.26** During gamete formation, the enzyme recombinase participates during [AIPMT 2012 (Prelims)]

- (1) metaphase I (2) anaphase II
- (3) prophase I (4) prophase II.

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**Q.27** Given below is the representation of a certain event at a particular stage of a type of cell division. Which is this stage? [AIPMT 2012 (Prelims)]



- (1) Prophase of Mitosis
- (2) Both prophase and metaphase of mitosis
- (3) Prophase I during meiosis
- (4) Prophase-II during meiosis

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**Q.28** Synapsis occurs between

[AIPMT 2009]

- (1) mRNA and ribosomes
- (2) spindle fibres and centromere
- (3) two homologous chromosomes
- (4) a male and a female gamete

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### ANSWER KEY

| Ques. | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
|-------|----|----|----|----|----|----|----|----|----|----|----|
| Ans.  | 4  | 1  | 3  | 4  | 1  | 1  | 1  | 3  | 4  | 3  | 4  |
| Ques. | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| Ans.  | 2  | 4  | 1  | 1  | 3  | 2  | 3  | 1  | 4  | 1  | 4  |
| Ques. | 23 | 24 | 25 | 26 | 27 | 28 |    |    |    |    |    |
| Ans.  | 1  | 1  | 3  | 3  | 3  | 3  |    |    |    |    |    |