

Sample Paper

10

Time : 90 Minutes

Max. Marks : 50

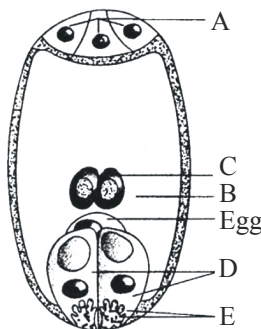
General Instructions

1. The Question Paper contains three sections.
2. **Section A** has 24 questions. Attempt any 20 questions.
3. **Section B** has 24 questions. Attempt any 20 questions.
4. **Section C** has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking

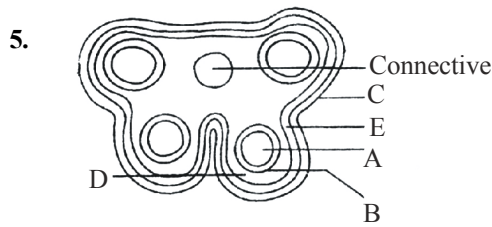
SECTION-A

DIRECTION: This section consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

1. What is the fate of the seven cells of the embryo sac ?
 - (a) All but one disintegrate upon fertilization.
 - (b) Two become fertilized; the others disintegrate.
 - (c) Two become fertilized; the others fuse to form endosperm.
 - (d) All are involved in nuclear fusion events.
2. Identify A, B, C, D and E structures shown in figure of a female gametophyte respectively-

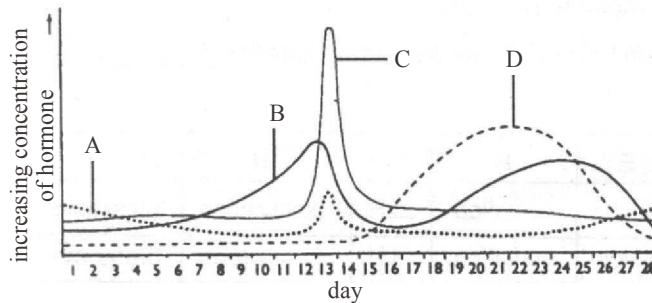


- (a) Antipodal cells, Central cell, Polar nuclei, Synergids and Acrosome
 - (b) Antipodal cells, Central cell, Polar nuclei, Synergids and Filiform apparatus
 - (c) Synergids, Central cell, Polar nuclei, Antipodal cells and Filiform apparatus
 - (d) Synergids, Megaspore mother cell, Polar nuclei, Synergids, Filiform apparatus
3. Megaspores are produced from the megaspore mother cells after
 - (a) Meiotic division
 - (b) Mitotic division
 - (c) Formation of a thick wall
 - (d) Differentiation
 4. During microsporogenesis, meiosis occurs in
 - (a) endothecium
 - (b) microspore mother cells
 - (c) microspore tetrads
 - (d) pollen grains

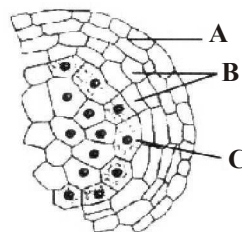


The above diagram refers to a T. S. of anther. Identify A to E respectively-

- (a) Sporogenous tissue, tapetum, epidermis, middle layer, endothecium
 - (b) Sporogenous tissue, epidermis, tapetum, middle layer, endothecium
 - (c) Sporogenous tissue, epidermis, middle layer, tapetum, endothecium
 - (d) Sporogenous tissue, tapetum, middle layer, epidermis, endothecium
6. The function of the seminal vesicle is to
- (a) produce a solution of fructose to provide energy for the mitochondria of the sperm.
 - (b) secrete alkaline fluids that neutralize the acidity of the female's reproductive tract.
 - (c) initiate the muscular contractions leading to emission.
 - (d) produce prostaglandins that stimulate contractions of the male reproductive organs.
7. In the given diagram identify the marked hormones.



- | | | | |
|----------|--------------|----------|--------------|
| A | B | C | D |
| (c) FSH | Progesterone | LH | Oestrogen |
| (d) LH | Progesterone | FSH | Oestrogen |
| (b) FSH | Oestrogen | LH | Progesterone |
| (a) LH | Oestrogen | FSH | Progesterone |
8. Hormones secreted by the placenta to maintain pregnancy are
- (a) hCG, hPL, progesterons, prolactin
 - (b) hCG, hPL, estrogens, relaxin, oxytocin
 - (c) hCG, progesterons, estrogens, glucocorticoids
 - (d) hCG, hPL, progesterons, estrogens
9. Uterine endometrium, epithelial glands and connective tissue are broken in menstrual phase. This is due to
- (a) over secretion of FSH
 - (b) lack of oestrogen
 - (c) lack of progesterone
 - (d) over production of progesterone
10. The given diagram shows microsporangium of a mature anther. Identity A, B and C.



- (a) A-Middle layer, B-Endothecium, C-Tapetum
- (b) A-Endothecium, B-Tapetum, C-Middle layer
- (c) A-Endothecium, B-Middle layer, C-Tapetum
- (d) A-Tapetum, B-Middle layer, C-Endothecium

11. Which of the following is false in angiosperms?
 (a) Egg cell Haploid
 (b) Megaspore Diploid
 (c) Pollen grain Haploid
 (d) Synergid Haploid
 (e) Endosperm Triploid
12. When dominant and recessive alleles express itself together it is called
 (a) codominance (b) dominance (c) amphidominance (d) pseudodominance
13. Two organisms that are true-breeding for a certain genetic characteristic are mated and their offspring analysed. Which of the following statements about this situation is true?
 (a) Both parents are homozygotes.
 (b) The offspring are either all homozygotes or all heterozygotes.
 (c) The offspring represent the F_1 generation and the gametes produced by the offspring will carry only one allele for this gene.
 (d) All of the above
14. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?
 (a) 25% (b) 100% (c) 75% (d) 50%
15. Haemophilia is mentioned as a trait carried by the mother and passed to her sons. What is the pattern of inheritance for this trait?
 (a) Haemophilia is an allele carried on one of the mother's autosomal chromosomes.
 (b) Haemophilia is an allele carried on the Y chromosome because more males have this genetic disorder than females.
 (c) Haemophilia is an allele carried on the X chromosome and can be directly inherited by the son from the father or the mother.
 (d) Haemophilia is carried on the X chromosome and can only be inherited by the son if the mother is a carrier.
16. The chromosome constitution $2n-2$ of an organism represents
 (a) Monosomic (b) Nullisomic (c) Haploid (d) Trisomic
17. Match the terms in Column- I with their description in Column- II and choose the correct option
- | Column- I | Column- II |
|-------------------|---|
| A. Dominance | I. Many genes govern a single character |
| B. Co-dominance | II. In heterozygous only one allele expresses itself |
| C. Pleiotropy | III. In heterozygous organism both alleles express themselves |
| D. Polygenic Inh. | IV. Single gene influences many characters |
- (a) A-IV; B-III; C-I; D-II
 (b) A-II; B-I; C-IV; D-III
 (c) A-II; B-III; C-IV; D-I
 (d) A-IV; B-I; C-II; D-III
18. Degeneration of a genetic code is attributed to the
 (a) third member of a codon (b) first member of a codon
 (c) second member of a codon (d) entire codon
19. tRNA takes part in
 (a) transfer of genetic code to cytoplasm.
 (b) carry amino acids to ribosomes.
 (c) collection of RNA in ribosomes.
 (d) copy the genetic code from DNA in nucleus.
20. Proof reading and repair occur
 (a) at anytime during or after synthesis of DNA.
 (b) only before DNA methylation occurs.
 (c) only in the presence of DNA polymerase.
 (d) only in the presence of an excision repair mechanism.
21. The primary function of DNA polymerase is to
 (a) add nucleotides to the growing daughter strand.
 (b) seal nicks along the sugar-phosphate backbone of the daughter strand.
 (c) unwind the parent DNA double helix.
 (d) prevent reassociation of the denatured parent DNA strands.

22. DNA fingerprinting refers to
- molecular analysis of profiles of DNA samples
 - analysis of DNA samples using imprinting devices
 - techniques used for molecular analysis of different specimens of DNA
 - techniques used for identification of fingerprints of individuals.



The figure gives an important concept in the genetic implication of DNA. Fill the blanks A, B and C.

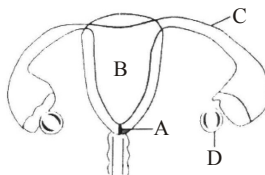
- A – Francis Crick; B – translation; C – transcription
 - A – Maurice Wilkins; B – transcription; C – translation
 - A – James Watson; B – replication; C – extension
 - A – Erwin Chargaff; B – translation; C – replication
24. DNA fragments are:
- Negatively charged
 - Neutral
 - Either positively or negatively charged depending up on their size
 - Positively charged

SECTION-B

DIRECTION: This section consists of 24 questions (Sl. No. 25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.





Question No. 25 to 28: Consist of two statements Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- If both Assertion and Reason are True and the Reason is a correct explanation of the Assertion.
 - If both Assertion and Reason are True but Reason is not a correct explanation of the Assertion.
 - If the Assertion is True but Reason is False.
 - If both Assertion and Reason are False.
25. **Assertion:** MTPs are also essential in certain cases where continuation of the pregnancy could be harmful or even fatal either to the mother or to the foetus or both.
Reason: MTPs are considered safe during the first 25 weeks of pregnancy.
26. **Assertion:** Pill Mala D is taken daily and the pill saheli taken weekly.
Reason: Oral contraceptives have pregnancy rates less than 1 percent.
27. **Assertion:** Male urethra is also called urinogenital duct.
Reason: The male urethra carries both urine and sperms.
28. **Assertion:** Deletion and insertion of base pairs of DNA, cause frame-shift mutation.
Reason: Sickle cell anaemia is a classic example of framshift mutations.
29. The given diagram is labelled as A, B, C and D. Which of the following label represents uterus.

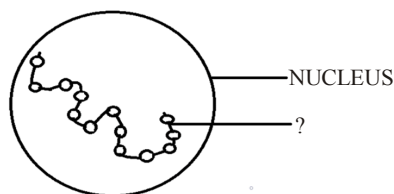


- Label B
 - Label C
 - Label D
 - Label A
30. Which of the following statements is wrong?
- Sertoli cells provide nutrition to the developing male germ cells.
 - Leydig cells synthesise and secrete androgens.
 - Secretions of the acrosome helps the sperm to enter into the cytoplasm of the ovum.
 - Secondary spermatocytes are diploid.
 - The fluid filled cavity in the tertiary follicle is called antrum.

31. Ovules are attached to a parenchymatous cushion called
 (a) nucellus (b) obturator (c) conducting tissue (d) placenta
32. Menstruation results in the discharge of
 (a) the corpus luteum of the uterus.
 (b) surface cells from the vagina.
 (c) blood from the outer surface of the uterus.
 (d) the endometrial lining.
33. The stage transferred into the uterus after induced fertilization of ova in the laboratory is:
 (a) Zygote (b) Embryo at 4 blastomere stage
 (c) Embryo at 2 blastomere stage (d) Morula
34. Which of the following is not *true* about the birth control pill?
 (a) The pill works by preventing ovulation.
 (b) The pill works by preventing implantation.
 (c) The ovarian cycle is suspended by the birth control pill.
 (d) The birth control pill contains low doses of estrogen and progesterone.
35. In angiosperms pollen tubes liberate their male gametes into the
 (a) central cell (b) antipodal cell (c) egg cell (d) synergids
36. A girl has blood group A and her brother has blood group B. Which combination of genotypes cannot belong to their parents?

Mother	Father
(a) $I^A I^A$	$I^B I^O$
(b) $I^A I^B$	$I^A I^B$
(c) $I^O I^O$	$I^A I^B$
(d) $I^B I^O$	$I^A I^O$
37. A woman with 47 chromosomes due to three copies of chromosome 21 is characterized by:
 (a) superfemaleness (b) triploidy
 (c) Turner's syndrome (d) Down's Syndrome
38. In males of grasshoppers and moths, there are two pairs of autosomes and one
 (a) X only (b) X and Y (c) Y only (d) None of these
39. Which one of the following symbols and its representation, used in human pedigree analysis is correct?
 (a)  = mating between relatives
 (b)  = unaffected male
 (c)  = unaffected female
 (d)  = male affected
40. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by
 (a) Only daughters (b) Only sons
 (c) Both sons and daughters (d) Only grandchildren
41. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 plants were selfed the resulting genotypes were in the ratio of
 (a) 1 : 2 : 1 :: Tall homozygous : Tall heterozygous : Dwarf
 (b) 1 : 2 : 1 :: Tall heterozygous : Tall homozygous : Dwarf
 (c) 3 : 1 :: Tall : Dwarf
 (d) 3 : 1 :: Dwarf : Tall
42. How many base pairs (bp) are found in the haploid genome of humans?
 (a) 2.9×10^9 (b) 4×10^8 (c) 7×10^9 (d) 3×10^9
43. Removal of introns and joining the exons in a defined order in a transcription unit is called:
 (a) tailing (b) transformation (c) capping (d) splicing

44. A short sequence of bases on one strand of DNA is AGTCTACCGATAGT. If this sequence serves as a template for the formation of a new strand of DNA, what will be the corresponding base sequence in the new strand?
- (a) AGTCTACCGATAGT (b) TCAGATGGCTATCA
(c) TGATAGCCATCTGA (d) GACATCGATTTCGAT
45. The genotype of a plant showing the dominant phenotype can be determined by :
- (a) test cross (b) dihybrid cross
(c) pedigree analysis (d) back cross
46. RNA primers are necessary in DNA synthesis because
- (a) DNA polymerase can only add to an existing strand of nucleotides.
(b) DNA polymerase can only add to an existing DNA strand.
(c) DNA primase is the first enzyme in the replication complex.
(d) All of the above
47. Nucleosome is
- (a) intron interrupted DNA
(b) double helix DNA
(c) negatively charged DNA wrapped around positively charged histone octamer
(d) satellite DNA
48. What is the structure present inside the nucleus known as?







- (a) Chromosome (b) Cell wall
(c) Ribosome (d) Lysosome

SECTION-C

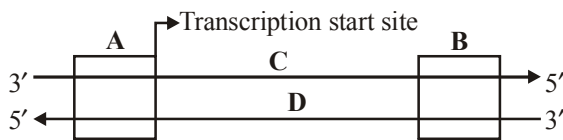
DIRECTION: This section consists of one case followed by 6 questions linked to this case (Q.No.49 to 54). Besides this, 6 more questions are given. Attempt any 10 questions in this section. The first attempted 10 questions would be evaluated.

In group discussion during laboratory class, the process of seed formation in flowering plants was being discussed. One student pointed out that the pollination is a major step involved in seed formation. Another student asked how the pollination occur in plants present in water. The teacher explained the process of pollination to solve their queries.

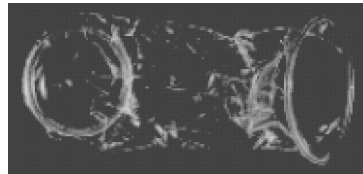
49. Plants with ovaries having only one or a few ovules are generally pollinated by
- (a) bees (b) butterflies (c) birds (d) wind
50. Pollination is best defined as
- (a) Germination of pollen grains
(b) Visiting flowers by insects
(c) Transfer of pollen from anther to stigma
(d) Growth of pollen tube in ovule
51. If a pollen of a flower falls on the stigma of another flower belonging to the same plant it is
- (a) Genetically self pollination and ecologically cross pollination
(b) Ecologically cross pollination
(c) Genetically and ecologically cross pollination
(d) None of these
52. Wind pollinated plants differ from insect pollinated plants in having
- (a) Small petals and sticky pollen
(b) small coloured petals and heavy pollen
(c) Coloured petal and large pollens
(d) No petals and light pollen

53. Insect pollinated flowers usually possess
 (a) Dry pollens with smooth surface
 (b) Sticky pollens with rough surface
 (c) Large quantities of pollen
 (d) Brightly coloured pollens
54. Both chasmogamous and cleistogamous flowers are present in
 (a) Helianthus (b) Commelina (c) Rosa (d) Gossypium
55. Which of the following symbol represents the offspring whose sex is unspecified?
 (a)  (b)  (c)  (d) 

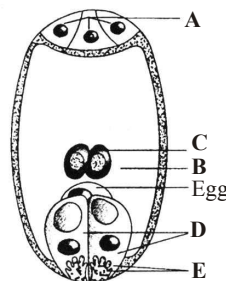
56. Given diagram represents the schematic structure of a transcription unit with some parts labelled as A, B, C and D. Select the option which shows its correct labelling.



- | A | B | C | D |
|----------------|------------|-----------------|-----------------|
| (a) Terminator | Promoter | Template strand | Coding strand |
| (b) Promoter | Terminator | Coding strand | Template strand |
| (c) Promoter | Terminator | Template strand | Coding strand |
| (d) Terminator | Promoter | Coding strand | Template strand |
57. Refer the given figure below and answer the question. Which feature is correctly associated with the given figure?

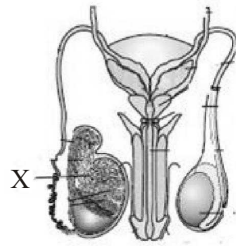


- (a) It is a male condom which is used to cover the penis just before the coitus to prevent the entry of ejaculated semen into the female reproductive tract.
 (b) It is a female condom which is used to cover the cervix and vagina just before the coitus.
 (c) It is a condom which is used to cover penis in male and vagina and cervix in female.
 (d) It is one type of IUDs which makes the uterus unsuitable for implantation and cervix hostile to the sperms.
58. Given diagram is labelled as A, B, C, D and E. Identify only C and E.

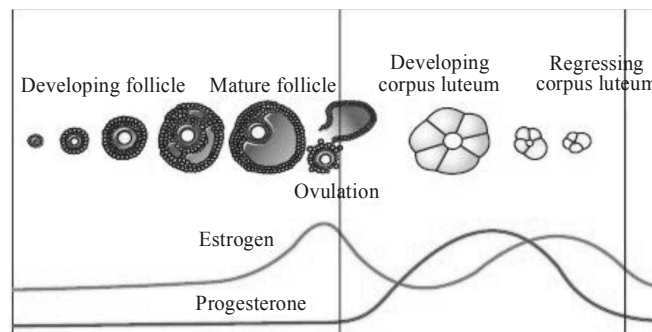


- (a) C – Polar nuclei, E – Chalazalend
 (b) C – Filiform apparatus, E – Synergids
 (c) C – Polar nuclei, E – Filiform apparatus
 (d) C – Synergids, E – Polar nuclei

59. Identify the structure marked as "X" and its function in the given figure of male reproductive system.



- (a) Rete testis: It helps seminiferous tubule to open into vas efferentia.
 (b) Bulbourethral gland: It secretes alkaline mucus for lubricating the reproductive tract.
 (c) Vas efferentia: They have contractile mechanism that aids in the emission of seminal fluid.
 (d) Seminal vesicle: It synthesizes and secretes testicular hormone.
60. Study the given figure and identify the correct event occurring in this.



- (a) Role of pituitary hormones levels.
 (b) Events occurring in uterine tissues.
 (c) Role of ovarian hormones levels and growth of ovarian follicles.
 (d) Both (a) and (c).

OMR ANSWER SHEET

Sample Paper No – 10

- ★ Use Blue / Black Ball pen only.
- ★ Please do not make any stray marks on the answer sheet.
- ★ Rough work must not be done on the answer sheet.
- ★ Darken one circle deeply for each question in the OMR Answer sheet, as faintly darkened / half darkened circle might be rejected.

Start time : _____ End time _____ Time taken _____

1. Name (in Block Letters)

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2. Date of Exam

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3. Candidate's Signature

SECTION-A

1.	(a)	(b)	(c)	(d)	9.	(a)	(b)	(c)	(d)	17.	(a)	(b)	(c)	(d)
2.	(a)	(b)	(c)	(d)	10.	(a)	(b)	(c)	(d)	18.	(a)	(b)	(c)	(d)
3.	(a)	(b)	(c)	(d)	11.	(a)	(b)	(c)	(d)	19.	(a)	(b)	(c)	(d)
4.	(a)	(b)	(c)	(d)	12.	(a)	(b)	(c)	(d)	20.	(a)	(b)	(c)	(d)
5.	(a)	(b)	(c)	(d)	13.	(a)	(b)	(c)	(d)	21.	(a)	(b)	(c)	(d)
6.	(a)	(b)	(c)	(d)	14.	(a)	(b)	(c)	(d)	22.	(a)	(b)	(c)	(d)
7.	(a)	(b)	(c)	(d)	15.	(a)	(b)	(c)	(d)	23.	(a)	(b)	(c)	(d)
8.	(a)	(b)	(c)	(d)	16.	(a)	(b)	(c)	(d)	24.	(a)	(b)	(c)	(d)

SECTION-B

25.	(a)	(b)	(c)	(d)	33.	(a)	(b)	(c)	(d)	41.	(a)	(b)	(c)	(d)
26.	(a)	(b)	(c)	(d)	34.	(a)	(b)	(c)	(d)	42.	(a)	(b)	(c)	(d)
27.	(a)	(b)	(c)	(d)	35.	(a)	(b)	(c)	(d)	43.	(a)	(b)	(c)	(d)
28.	(a)	(b)	(c)	(d)	36.	(a)	(b)	(c)	(d)	44.	(a)	(b)	(c)	(d)
29.	(a)	(b)	(c)	(d)	37.	(a)	(b)	(c)	(d)	45.	(a)	(b)	(c)	(d)
30.	(a)	(b)	(c)	(d)	38.	(a)	(b)	(c)	(d)	46.	(a)	(b)	(c)	(d)
31.	(a)	(b)	(c)	(d)	39.	(a)	(b)	(c)	(d)	47.	(a)	(b)	(c)	(d)
32.	(a)	(b)	(c)	(d)	40.	(a)	(b)	(c)	(d)	48.	(a)	(b)	(c)	(d)

SECTION-C

49.	(a)	(b)	(c)	(d)	53.	(a)	(b)	(c)	(d)	57.	(a)	(b)	(c)	(d)
50.	(a)	(b)	(c)	(d)	54.	(a)	(b)	(c)	(d)	58.	(a)	(b)	(c)	(d)
51.	(a)	(b)	(c)	(d)	55.	(a)	(b)	(c)	(d)	59.	(a)	(b)	(c)	(d)
52.	(a)	(b)	(c)	(d)	56.	(a)	(b)	(c)	(d)	60.	(a)	(b)	(c)	(d)

No. of Qns. Attempted		Correct		Incorrect		Marks	
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