THE JAIN INTERNATIONAL SCHOOL, KANPUR

PRE- TERM-1 (2021-22)

Class XII

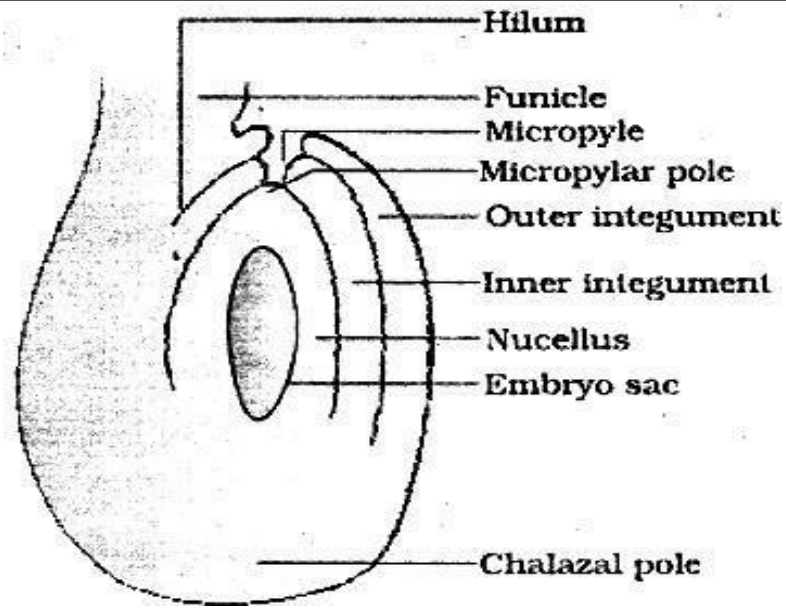
Biology (044) Theory

Time: 90 Minutes **Maximum 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 Section – A consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.
1	Identify the wrong statement regarding post-fertilisation development. (a) The ovary wall develops into pericarp. (b) The outer integument of ovule develops into tegmen. (c) The fusion nucleus (triple nucleus) develops into endosperm. (d) The ovule develops into seed
2	In the figure of anatropous ovule given below, choose the correct option for the characteristic distribution of cells within the typical embryo sac



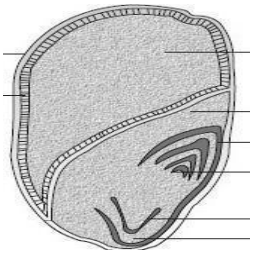
	INTEGUMENT	FUNICLE	MICROPYLE
A	stalk that attaches an ovule to the placenta in the ovary	helps to absorb water at the time of germination of the seed	houses the embryo sac as well as nutritive tissue
B	develop into the seed coat when the ovule matures after fertilization.	stalk that attaches an ovule to the placenta in the ovary	helps to absorb water at the time of germination of the seed
C	houses the embryo sac as well as nutritive tissue	develop into the seed coat when the ovule matures after fertilization.	stalk that attaches an ovule to the placenta in the ovary
D	helps to absorb water at the time of germination of the seed	houses the embryo sac as well as nutritive tissue	develop into the seed coat when the ovule matures after fertilization.

3 An embryo may sometimes develop from any cell of embryo sac other than egg. It is termed as
(a) apospory
(b) apogamy
(c) parthenogenesis
(d) parthenocarpy

4 Nonessential floral organs in a flower are
(a) sepals and petals
(b) anther and ovary
(c) stigma and filament
(d) petals only

Which of the following statements are true related to Seed X and Y?

SEED X



SEED Y

	SEED X	SEED Y
A	dicot and endospermic	monocot and endospermic
B	monocot and endospermic	dicot and non-endospermic
C	monocot and non-endospermic	dicot and endospermic
D	dicot and non-endospermic	monocot and endospermic

6 Coleoptile and coleorhiza are the protective sheaths _____ covering _____ and _____ respectively.
(a) plumule, epicotyl
(b) radicle, plumule
(c) plumule, radicle
(d) radicle, hypocotyl

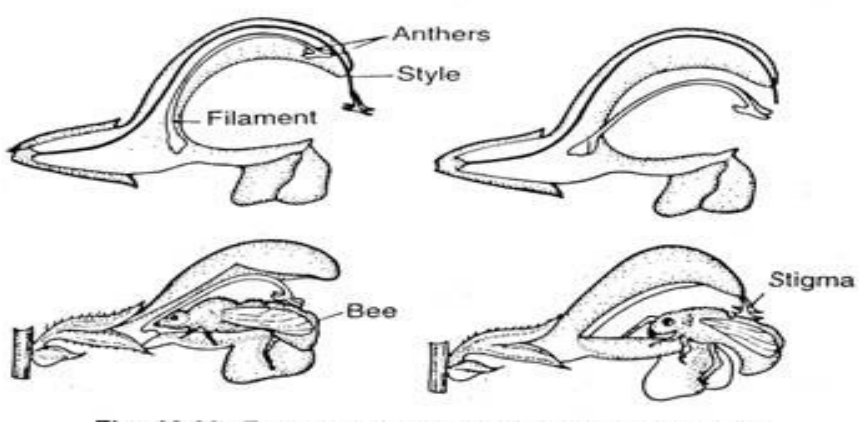
7 Which of the following is correct about mammalian testes?
(a) Graafian follicles, Sertoli cells, Leydig's cells
(b) Graafian follicles, Sertoli cells, Seminiferous tubules
(c) Sertoli cells, Seminiferous tubules, Leyding's cells
(d) Graafian follicle, leyding's cells, Seminiferous tubule

8 Seminal plasma, the fluid part of semen, is contributed by
(i) seminal vesicle (ii) prostate (iii) urethra (iv) bulbourethral gland

(a) (i) and (ii)
(b) (i), (ii) and (iv)
(c) (ii), (iii) and (iv)
(d) (i) and (iv).

9 During oogenesis, each diploid cell produces
(a) four functional eggs
(b) two functional eggs and two polar bodies
(c) one functional egg and three polar bodies
(d) four functional polar bodies.

10 In the dioecious aquatic plant shown, identify the characteristics of the male flowers that reach the female flowers for pollination:



	Type of the flower	Colour of flower	Characteristic feature of Pollen grain
A	unisexual	brightly coloured	Light weight and non-sticky
B	hermaphr odite	Colourless	large and sticky
C	unisexual	White	small, covered with mucilage
D	hermaphr odite	Colourlful	Small and sticky

11 A. Layers of an ovum from outside to inside is
(a) corona radiata, zona pellucida and vitelline membrane
(b) zona pellucida, corona radiata and vitelline membrane
(c) vitelline membrane, zona pellucida and corona radiata
(d) zona pellucida, vitelline membrane and corona radiata

12 Layers of an ovum from outside to inside is
(a) corona radiata, zona pellucida and vitelline membrane
(b) zona pellucida, corona rodiata and vitelline membrane
(c) vitelline membrane, zona pellucida and corona radiata
(d) zona pellucida, vitelline membrane and corona radiata

13 The technique called Gamete Intra Fallopian Transfer (GIFT) is recommended for those females
(a) who cannot produce an ovum
(b) who cannot retain the foetus inside uterus
(c) who cannot provide suitable environment for fertilisation
(d) all of these

14 Increased IMR and decreased MMR in a population will
(a) cause rapid increase in growth rate
(b) result in decline in growth rate
(c) not cause significant change in growth rate
(d) result in an explosive population.

15 Which of the following STDs are not completely curable?
(a) Chlamydiasis, Gonorrhoea, Trichomoniasis
(b) Chancroid, Syphilis, Genital warts
(c) AIDS, Syphilis, Hepatitis B
(d) AIDS, Genital herpes, Hepatitis B

16 Which of the following combination of chromosome numbers represents the correct sex determination pattern in birds?
A. Male XX, Female XY
B. Male WW, Female WZ
C. Female ZW, Male ZZ
D. Female XX, Male XY

17 Rajesh and Mahesh are suffering from sickle cell anemia and phenyl ketonuria respectively. Which of the option is correct about these diseases-?

	Sickle cell anemia	**Phenyl ketonuria**
A	Autosomal, recessive	Autosomal, recessive
B	Autosomal, dominant	Sex linked, recessive
C	Sex linked, recessive	Sex linked, dominant
D	Sex linked, dominant	Autosomal, dominant

18 What is the work of copper-T?
(a) To inhibit ovulation
(b) To inhibit fertilisation
(c) To inhibit implantation of blastocyst
(d) To inhibit gametogenesis

19 From a cross AABb x aaBb, the genotypes AaBB : AaBb : Aabb will be obtained in the ratio
(a) 1:1:2
(b) 1:2:1
(c) 2:1:1
(d) 2:1:2

20 Mother and father of a person with ‘O’ blood group have ‘A’ and ‘B’ blood group respectively. What would be the genotype of both mother and father?
(a) Mother is homozygous for ‘A’ blood group and father is heterozygous for ‘B’.
(b) Mother is heterozygous for ‘A’ blood group and father is homozygous for ‘B’.
(c) Both mother and father are heterozygous for ‘A’ and ‘B’ blood group, respectively.
(d) Both mother and father are homozygous for ‘A’ and ‘B’ blood group, respectively.

21	In sickle cell anaemia glutamic acid is 'replaced by valine. Which one of the following triplets codes for valine? (a) G G G (b) A A G (c) G A A (d) G U G
22	In a dihybrid cross, if you get 9 : 3 : 3 : 1 ratio it denotes that (a) the alleles of two genes are interacting with each other (b) it is a multigenic inheritance (c) it is a case of multiple allelism (d) the alleles of two genes are segregating independently
23	In the F2 generation of a Mendelian dihybrid cross the number of phenotypes and genotypes are (a) phenotypes – 4; genotypes – 16 (b) phenotypes – 9; genotypes – 4 (c) phenotypes – 4; genotypes – 8 (d) phenotypes – 4; genotypes – 9
24	In Antirrhinum (dog flower), phenotypic ratio in F_2 generation for the inheritance of flower colour would be (a) 3 : 1 (b) 1 : 2 : 1 (c) 1 : 1 (d) 2 : 1
SECTION -B Section - B 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: A. Both A and R are true and R is the correct explanation of A B. Both A and R are true and R is not the correct explanation of A C. A is true but R is false D. A is False but R is true
25	**Assertion:** A typical microsporangium of angiosperms is generally surrounded by four wall layers. **Reason:** The outer three wall layers perform the function of protection and help in dehiscence of anther to release the pollen
26	**Assertion:** Exine of a pollen grain is made up of sporopollenin which are resistant to high temperatures, strong acids or alkali as well as enzymatic degradation. **Reason:** Sporopollenins are absent in the region of germ pores.

27	**Assertion:** An angiospermous flower represents the modified condensed shoot which performs the function of sexual reproduction. **Reason:** The fertile leaves of the shoot become modified into micro sporophylls and megasporophylls' which bear ovules and anthers respectively.
28	**Assertion:** Although geitonogamy is functionally cross-pollination involving a pollinating agent, genetically it is similar to autogamy since the pollen grains come from the same parent. **Reason:** In geitonogamy, pollen grains from the anthers of one flower are transferred to the stigma of another flower borne on the same plant.
29	**Assertion:** Nuclear endosperm is formed by subsequent nuclear division without wall formation. **Reason:** Coconut is an example of such endosperm, where the endosperm remains nuclear throughout the development of the fruit.
30	**Assertion:** The method of development of embryo sac from a single functional megaspore is termed as monosporic development. **Reason:** In monosporic type of embryo sac development, usually the megaspore which is situated towards micropylar end remains functional.
31	**Assertion:** Finger-like projections appear on the trophoblast called chorionic villi after implantation. **Reason:** Chorionic villi are surrounded by the uterine tissue and maternal blood.
32	**Assertion:** The type B spermatogonia undergo mitosis to form primary spermatocyte. **Reason:** Primary spermatocyte completes the first meiotic division leading to secondary spermatocytes.
33	**Assertion:** Production of FSH increases, while that of LH decreases in the ovulation phase. **Reason:** Due to decrease in the level of LH, ovulation (releasing of ova) takes place.
34	**Assertion:** Ovum retains most of the contents of the primary oocyte and is much larger than spermatozoa. **Reason:** Ovum requires energy to go about in search of a spermatozoa for fertilisation.
35	**Assertion:** Placenta in addition to connection with mother and foetus, is a ductless gland. **Reason:** It releases human gonadotropins
36	**Assertion:** Death is one of the important regulatory processes on earth. **Reason:** It avoids over-crowding caused by continuous reproduction.
37	**Assertion:** Amniocentesis is often mis-employed. **Reason:** Amniocentesis is meant for determining the genetic disorders in the foetus, but it is being used to determine the sex of the foetus, leading to death of the normal female foetus.
38	**Assertion:** There is chance of fertilisation during 10 -17 days menstrual cycle. **Reason:** Ovulation occurs during these days.
39	**Assertion:** Cu-T and Cu-7 do not suppress sperm-motility. **Reason:** Hormones released by them do not affect sperm motility

40	**Assertion:** Chances of conception are almost nil as long as the mother breast-feeds the child fully. **Reason:** This method is based on the fact that ovulation do not occur during the period of intense lactation
41	**Assertion:** Infertility is the inability to produce children in spite of unprotected sex. **Reason:** Infertile couples could have children using assisted reproductive technologies (ART).
42	**Assertion:** IUT is the transfer of embryo with more than 8 blastomeres into the fallopian tubes. **Reason:** This is a very popular method of forming embryos in-vivo.
43	**Assertion:** Due to absence of any one of the X and Y sex chromosome Turner's syndrome is caused. **Reason:** Such individuals show masculine as well as feminine development.
44	**Assertion:** Haemophilia is a genetic disorder generally found in males. **Reason:** Haemophilia is a sex-linked trait and the gene for haemophilia is located on the Y- chromosome**.**
45	**Assertion:** In a diploid organism only, dominant mutations will show their effect immediately, recessive mutations do not influence the traits immediately. **Reason:** The recessive mutants accumulate in gene pool and once the recessive mutations has established homozygous state it is exposed to natural selection.
46	**Assertion:** Insects have female homogametic. **Reason:** In insects males shows XX sex chromosome and females shows XY sex chromosome
47	**Assertion:** The genetic complement of an organism is called genotype. **Reason:** Genotype is the type of hereditary properties of an organism.
48	**Assertion:** The F1-generation resembles both the parents in codominance. **Reason:** An example is different type of red blood cells that determine ABO blood grouping in humans.

SECTION - C

Section-C consists of **three case studies** followed by 4 questions linked to each case (Case-A Q.No.49 to 52; Case-B Q.No.53 to 56: Case-C Q.No.57 to 60.

Attempt any 10 questions in this section.

The first attempted 10 questions would be evaluated.

Case A	A 23 year old Shreyal has been diagnosed with an infection of reproductive tract caused by bacteria. He complains about burning sensation during urination, pus containing discharge and pain around genitalia. This infection has incubation period of 2-5 days but can be cured.
49	From which disease is Shreyal suffering A. Herpes B. Gonorrhea C. Syphilis D. Chlamydiasis

50	Which among the following reproductive tract infections is transmitted by bacteria A. Trichomoniasis B. Chancroid C. Genital warts D both a and b
51	What technique was used to diagnose Shreyal's disease A. Gram staining of discharge and culture B Elisa test C antibody detection D antigen test
52	Find the odd one out: A. *Treponema pallidum* *B Neisseria gonorrhoeae* *C. Haemophilia ducreyi* *D. Trichomonas vaginalis*
Case B	According to Mendel, one gene controls the expression of one character only. The ability of a gene to have multiple phenotypic effect because it influences a number of characters is an exception. The gene having a multiple phenotypic effect because of its ability to control of two or more characters can be seen in cotton. In cotton, a gene for the lint also influences the height of plant, size of the ball, number of ovules and viability of seeds.
53	Which of the following statements is not correct regarding genes with multiple phenotypic effect? (a) It is not essential that all the traits are equally influenced. (b) Occasionally a number of related changes are caused by a gene. (c) It occurs due to effect of the gene on two or more inter-related metabolic pathways (d) None of these
54	Which of the following is an example of gene with multiple phenotypic effect? (a) *Drosophila* white eye mutation (b) Kernel colour in wheat (c) Height in human beings (d) Skin colour in human beings
55	Genes with multiple phenotypic effects are known as (a) hydrostatic genes (b) duplicate genes (c) pleiotropic genes (d) complimentary genes.
56	Which of the following disorder is an example of genes with multiple phenotypic effects? (a) Phenylketonuria (b) Haemophilia (c) Sickle cell anaemia (d) Both (a) and (c)

Case C	Oogenesis is the process of formation of ovum in ovaries. It consists of three phases: multiplication, growth and maturation. Oogenesis is controlled by hormones GnRH, LH, FSH. GnRH secreted by the hypothalamus stimulates the anterior lobe of pituitary gland to secrete LH and FSH
57	What is the function of hormone FSH? (a) It inhibits the formation of estrogen. (b) It induces the release of secondary oocyte (c) It stimulates the growth of Graafian follicles. (d) It causes ovulation.
58	Which hormone induces the rupture of the mature Graafian follicle? (a) Follicle stimulating hormone (b) Gonadotropin releasing hormone (c) Progesterone (d) Luteinising hormone
59	Which cell division is involved in the formation of secondary oocyte? (a) Mitosis (b) Meiosis I (c) Amitosis (d) Meiosis II
60	Identify the function(s) of LH. (A) Release of secondary oocyte from Graafian follicle. (B) Stimulates corpus luteum to secrete progesterone. (C) Stimulates estrogen formation. (D) Promotes development of egg to form secondary oocyte. (a) (A) and (B) only (b) (B) and (C) only (c) (A), (C) and (D) only (d) (B) only

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