OSDAV Public School, Kaithal
FIRST UNIT TEST (May,2025)
CLASS- XII
SUBJECT- BIOLOGY

Set - A

Time:1hr 30 min. **M.M-35**

General Instructions:

1. **All questions are compulsory**

SECTION-A

Q.1 How many meiotic divisions would be required for a plant that undergoes monosporic development to give rise to 200 functional eggs? **1**
A.500 B.200 C.800 D.400

Q.2 Choose the correct option wherein, the correct stages of the development of human embryo takes place. **1**

	Ovary	Fallopian Tube	Uterus
A	Morula	Fertilised egg	Blastocyst
B	Unfertilized egg	Fertilised egg	Morula
C	Unfertilized egg	Fertilised egg	Blastocyst
D	Fertilised egg	Morula	Blastocyst

Q.3 Important attributes belonging to a population but not to an individual are : **1**
(i) Birth rate and death rate (ii) Male and female (iii) Birth and death (iv) Sex-ratio
a) i and ii b) iiand iii c) i and iii d) i and iv

Q.4 The technique called Gamete Intra Fallopian Transfer (GIFT) is recommended for those females **1**
(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

Q.5 Which of the following statements are correct with respect to hormones secreted by placenta? **1**
(i) Placenta secretes relaxin during later stages of pregnancy.
(ii) Placenta secretes a high amount of FSH during pregnancy.
(iii) Placenta secretes relaxin during the initial stage of pregnancy.
(iv) Placenta secretes hCG and hPL during pregnancy.
A. (i) and (iv) B. (i), (ii) and (iv) C. (iii) and (iv) D. (ii), (iii) and (iv)

Q.6 Match column I with column II and choose the correct option. **1**
(a) a-3, b-1,c-4, d-2 (b) a-2, b-4,c-3, d-1 (c) a-4, b-2,c-1, d-3 (d) a-2, b-4,c-1, d-3

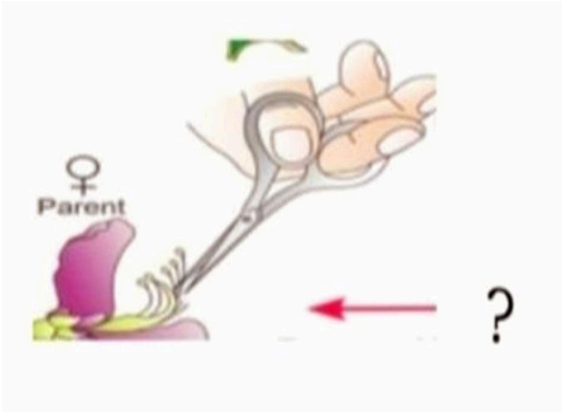
Column I	Column II
a. Sporogenous tissue	1.pollen grain
b. Nucellus	2.Microsporangium
c. Male gametophyte	3.Embryo sac
d. Female gametophyte	4.Megasporangium

Q.7	**Assertion and reason based questions** A) both assertion and reason are true and reason is the correct explanation of assertion B) both assertion and reason are true and reason is not the correct explanation of assertion C) assertion is true but reason is false D) assertion is false and reason is true **Assertion (A)**: The coconut endosperm is multinucleate throughout its development. **Reason (R)**: Some endosperms undergo free nuclear division without the formation of distinct cell boundaries.	**1**
Q.8	**Assertion:** The middle piece of sperm is called the powerhouse of the sperm. **Reason**: The numerous mitochondria coiling around axial filament produce energy for the movement of the tail.	**1**

SECTION-B

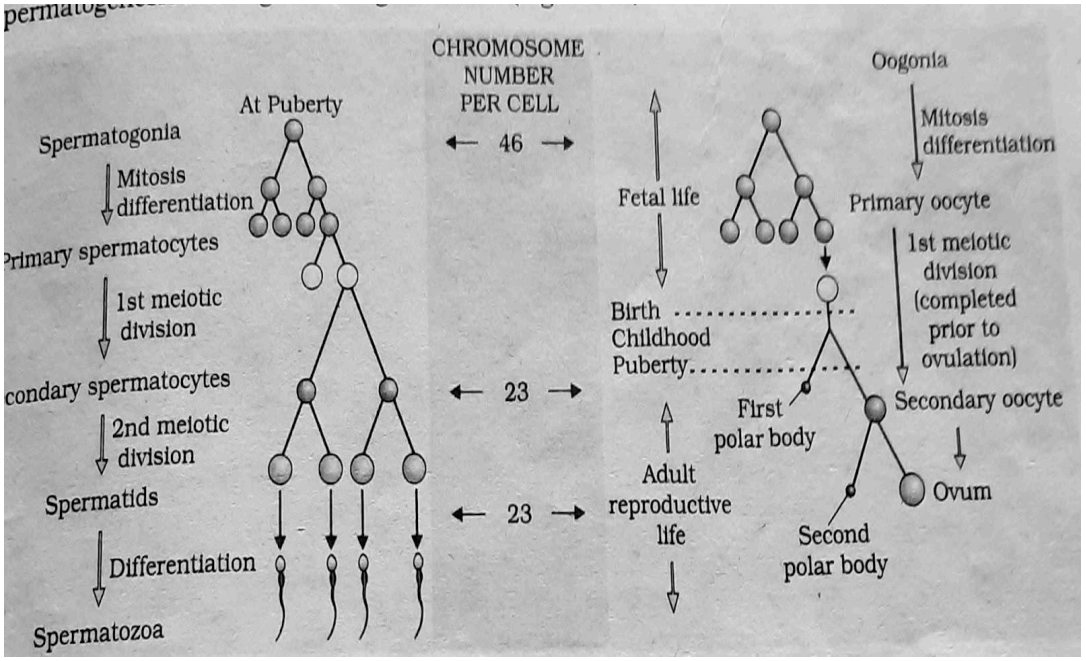
Q.9	What is zygote intra fallopian transfer technique? How is intrauterine transfer technique different from it?	**2**
Q.10	a)Explain the menstrual phase in a human female. b) Why is the follicular phase in the menstrual cycle also referred to as the proliferative phase? c) Explain the events that occur in a Graafian follicle at the time of ovulation and thereafter.	**2**

SECTION-C

Q.11	A)Outbreeding helps in the maintenance of an organism's ability to survive and perpetuate its genetic material. This is termed as biological fitness. (a) What is the term used to signify reduction of such biological fitness? (b) Explain one method of outbreeding devised by plants that requires a chemical intervention by the reproductive apparatus of a plant. B)Is there any difference between apomixis and parthenocarpy? Explain.	**3**
Q 12	A)Parturition is induced by a complex Neuro endocrine mechanism'. Justify B)In case of polyembryony, embryo A develops from the synergids and embryo B develops from the nucellus. State the ploidy of embryo A and B.	**3**
Q.13	A)Write one difference and one similarity between autogamy and geitonogamy with one example of each. B)Observe the diagram carefully, name the process and explain why it is required. 	**3**

SECTION-D

Q 14	**CASE STUDY BASED QUESTION** With reference to the schematic diagrams of spermatogenesis and oogenesis answer the following questions.. a.) About 300 million spermatozoa may be present in a human male ejaculation at one time. Calculate how many primary spermatocytes will be involved to produce this number of spermatozoa. b.) How many will spermatids be formed? c.)How many chromatids are found during Oogenesis in Primary oocyte and First polar body in a human female?	

		**4**

SECTION-E

Q.15	Describe the process of megasporogenesis up to fully developed embryo sac formation in an angiosperm.	**5**
Q.16	Explain in detail the various developmental stages of the zygote until implantation with suitable diagrams.	**5**

BIOLOGY-- XII
FIRST UNIT TEST(May,2025)
ANSWER KEY AND MARKING SCHEME Set-A
SECTION-A

Q.1	**B**	**1**
Q.2	**C**	**1**
Q.3	**D**	**1**
Q.4	**A**	**1**
Q.5	**A**	**1**
Q.6	**D**	**1**
Q.7	**A**	**1**
Q.8	**A**	**1**

SECTION-B

Q.9	Eggs are stimulated and collected using IVF methods. Then the eggs are mixed with sperm in the lab. Fertilized eggs (zygotes) are then returned to the fallopian tubes with laparoscopic surgery. The zygote or the early embryo upto 8 blastomeres (cells that are produced during cleavage of a zygote) is transferred into fallopian tube in zygote intra fallopian transfer (ZIFT) technique. If embryo contains more than 8 blastomeres and it is transferred into uterus than it is called intra uterine transfer (IUT).	**1** **1**
Q.10	a) Menstrual phase occurs when released ovum not fertilized, breakdown of endometrial lining (of the uterus) and its blood vessel form the liquid that comes out through the vagina, lasts for 3 to 5 days b) Primary follicle grows into Graafian follicle under the influence of & FSH,regeneration of endometrium (under the influence of estrogen) c) Graafian follicle ruptures to release the ovum (secondary oocyte),remaining parts of the Graafian follicle transform into corpus luteum	½ ½ ½ ½

SECTION-C

Q.11	A) (a) inbreeding depression. (b) - self incompatibility - The pollen of a plant is not allowed to germinate on the stigma of the same flower or on a different flower of the same plant due to pollen-pistil interactio B)Yes, parthenocarpy is different from apomixis. In parthenocarpy, the fruit is produced without the fertilization of the female gamete. It is used for the production of fruits without seeds such as banana and grapes for commercial purposes. Apomixis is the process in which the seeds are produced without fertilization but the process occurs in the female reproductive tract of the plant. In this, the megaspore mother cell does not undergo meiosis. It is used for the commercial production of hybrid varieties and in the production of virus-free varieties.	½ ½ **1** **1**
Q.12	A)Parturition is a process where vigorous contraction of the uterus at the end of pregnancy causes expulsion/delivery of the foetus. The signals for parturition originate from the fully developed fetus and the	**1/2× 4=2**

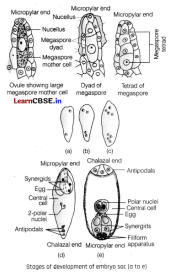
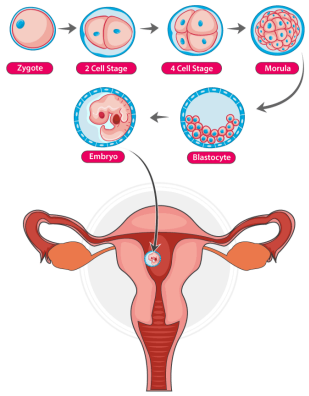
	placenta which induce mild uterine contractions called foetal ejection reflex. This triggers release of oxytocin from the maternal pituitary. Oxytocin acts on the uterine muscle and causes stronger uterine contractions, which in turn stimulates further secretion of oxytocin. The stimulatory reflex between the uterine contraction and oxytocin secretion continues resulting in stronger and stronger contractions.1 mark This leads to expulsion of the baby out of the uterus through the birth canal – parturition, after the infant is delivered; the placenta is also expelled out of the uterus. B) A-Haploid ; B-Diploid	**1**
Q.13	A)Difference… Autogamy: It is transfer of pollen grains from anther to stigma of the same flower. Geitonogamy is transfer of pollen grains from the anther to the stigma of another flower of the same plant. Similarly.. Genetically both are similar. B)Emasculation. The removal of anthers is required for crop breeding programmes so that the pollination can be done with the desired pollen only	**1** **1** **1**

SECTION-D

Q.14	a) Each primary spermatocyte will undergo meiosis-I and meiosis-2 which will result in 4 spermatozoa 300 million/4=75 million b) 300 million c) Since replication has occurred by this stage 46x2 = 92 chromatids in primary oocyte Meiosis –I is completed by this time 23×2 =46 chromatids in first polar body	**1** **1** **1** **1**

SECTION-E

Q.15	In angiosperms, the process of megasporogenesis starts inside the nucellus of the ovule. During megasporogenesis, the Megaspore Mother Cell (MMC) undergoes meiosis resulting in the production of four megaspores. Out of the four megaspores, only one is functional while the other three degenerate. The functional megaspore undergoes mitosis to form two nuclei, which migrate to opposite poles**,** forming a 2-nucleate embryo sac. Further, mitotic divisions lead to the formation of 4-nucleate and 8-nucleate stages of the embryo sac. In these mitotic divisions, nuclear division is not followed by cell division. After the 8-nucleate stage, cell walls are laid down and a typical female gametophyte or embryo sac is formed. Among the 8 nuclei, 6 are enclosed by cell walls and organised into cells, while the remaining 2 nuclei (polar nuclei) are situated above the egg apparatus in a large central cell. Out of the six cells, three are grouped at the micropylar end and constitute the egg apparatus. It is made up of two synergids and one egg cell. The other three cells are located at the chalazal end and are called antipodals. Thus, a typical angiosperm embryo sac after maturity is 8-nucleate and 7-celled	**1/2× 3=6** **2**

		
Q.16	When the zygote moves through the isthmus of the oviduct, the mitotic division is initiated and is called the cleavage towards the uterus to form 2,4,8,16 daughter cells called blastomeres. It is an embryo containing 8 to 16 blastomeres from the morula. It continues to transform and divide into blastocysts as it further approaches the uterus. In the blastocyst, the blastomeres are organized into an outer layer referred to as the trophoblast and the inner cell mass, which is an inner collection of cells attached to the trophoblast. This layer gets attached to the endometrium and the inner cell mass transforms into the embryo. After attachment, the cells of the uterus rapidly divide and covers up the entire blastocyst. This causes the blastocyst to implant in the endometrium of the uterus which leads to conception.  	**3** **2**

OSDAV Public School, Kaithal
FIRST UNIT TEST (May ,2025)
CLASS- XII
SUBJECT- BIOLOGY

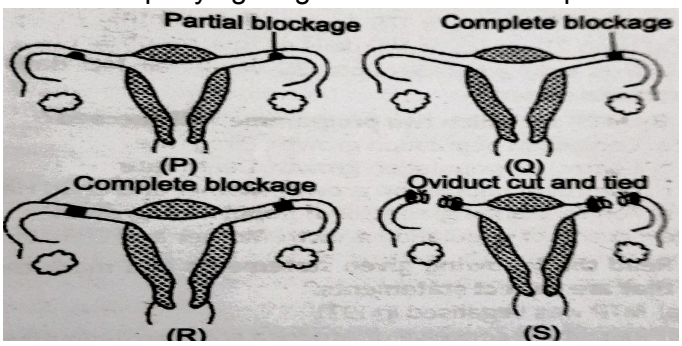
SET-B

Time:1hr.30 min. **MM:35**

General Instructions:

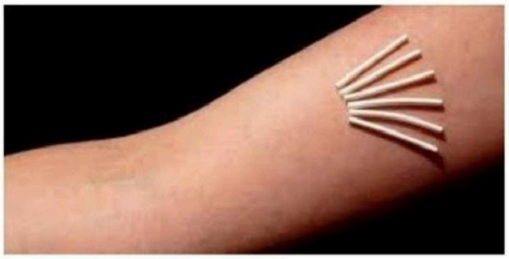
1. **All questions are compulsory**

SECTION-A

Q.1	Which of the following statements regarding the structure of microsporangium are correct? [i] it is generally surrounded by four wall layers- epidermis, endothecium, middle layers and tapetum. [ii] the outer three layers help in dehiscence of anther to release the pollen. [iii] the cells of tapetum undergo meiosis to produce microspore tetrad. (a) i] & [ii] (b) i] & [iii] (c) [ii] & [iii] (d) All of these	**1**
Q.2	The accompanying diagram shows the fallopian tubes of Four Women P Q R and S:  In which two women is fertilisation impossible at present? A) P and Q B)Q and R C) R and S D)S and P	**1**
Q.3	A dioecious flowering plant prevents A)Geitonogamy and xenogamy B)Autogamy and xenogamy C)Autogamy and geitonogamy D)Cleistogamy and xenogamy	**1**
Q.4	An infertile couple was advised to undergo in vitro fertilization by the doctor. Out of the options given below, select the correct stage for transfer to the fallopian tube for successful results? (a) Zygote only (b) Zygote or early embryo upto 8 blastomeres (c) Embryos with more than 8 blastomeres (d) Blastocyst Stage	**1**
Q.5	The ploidy of spermatogonia, primary spermatocyte, secondary spermatocyte and spermatid is (a) 2n, 2n, 2n, n (b) n, 2n, 2n, n (c) n, 2n, n, n (d) 2n, 2n, n, n	**1**
Q.6	There are 10 flowers in one individual plant of Pea. In each microsporangium of every stamen of all the flowers there are 30 microspore mother cells. How many pollen grains are formed from that plant? A) 4000 B)10,000 C) 24,000 D)48,00	**1**
Q.7	**Assertion and reason based questions** A) both assertion and reason are true and reason is the correct explanation of assertion B) both assertion and reason are true and reason is not the correct explanation of assertion C) assertion is true but reason is false D) assertion is false and reason is true **Assertion**: Vasectomy blocks gamete transport and thereby prevents conception.	**1**

	Reason: In vasectomy, a small part of the vas deferens is removed or tied up.	
Q.8	**Assertion (A**): Apomixis and parthenocarpy are both asexual modes of reproduction. **Reason (R):** Seeds are not produced in both apomixis and parthenocarpy	**1**

SECTION-B

Q.9	Identify the given diagram. What does it contain and is used for? 	**2**
Q.10	a)In which part of the human female reproductive system do the following events take place? I. Release of 1st polar body II. Release of 2nd polar body b) From where do the signals for parturition originate and what does maternal pituitary release for stimulating uterine contractions for childbirth.	**2**

SECTION-C

Q.11	A)Arrange them sequentially according to how they appear in the artificial hybridization programme. 1 Rebagging 2 Selection of parents 3.Bagging 4.Dusting the pollen on the stigma 5.Emasculation 6.Collection of pollen B). Is there any difference between apomixis and parthenocarpy? Explain the benefits of each.	**3**
Q 12	Describe the embryonic development of a zygote upto its implantation in humans.	**3**
Q.13	State the agent(s) which helps in pollinating in the following plants. Explain the adaptations in these plants to ensure pollination: (a) Corn b) Water hyacinth (c) Vallisneria	**3**

SECTION-D

Q 14	**CASE STUDY BASED QUESTION** A couple just married do not want a child and focus on their respective careers. They want to use a contraception method for 3- 4 years. The female partner has an allergy with physical barriers. She doesn't want to use oral contraceptives. A. Suggest a contraceptive method which suits their requirement. B. Is there any method to avoid pregnancy after unprotected coitus in an emergency? Yes, or no, Justify your answer. C.Mention different types of IUD. D. Write one example each type.	**4**

SECTION-E

Q.15	Describe the process of megasporogenesis up to fully developed embryo sac formation in an angiosperm.	**5**
Q.16	(i) Draw a diagram of an enlarged view of TS of one microsporangium of an angiosperm and label the following parts (a) Tapetum (b) Middle layers (c) Endothecium (d) Microspore mother cell (ii) Mention the characteristic features and function of tapetum. (iii) Explain the following giving reasons (a) Pollen grains are well-preserved as fossils. (b) Pollen tablets are in use by people these days.	**5**

BIOLOGY-- XII
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ANSWER KEY AND MARKING SCHEME Set-B
SECTION-A

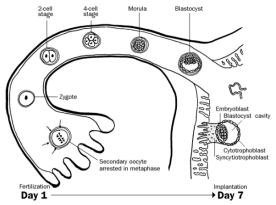
Q.1	**A**	**1**
Q.2	**C**	**1**
Q.3	**C**	**1**
Q.4	**B**	**1**
Q.5	**D**	**1**
Q.6	**D**	**1**
Q.7	**A**	**1**
Q.8	**C**	**1**

SECTION-B

Q.9	Implant. It contains a form of hormone progesterone and use as contraceptive under the skin of upper arm	**2**
Q.10	(a) I) Ovary II) In the isthmus- ampullary junction of the fallopian tube . b) Fully developed foetus and placenta, oxytocin.	**1** **1**

SECTION-C

Q.11	A)a) Selection of parents b) Emasculation c) Bagging d) Collection of pollen e) Dusting of pollen on the stigma f) Rebagging B)Yes, parthenocarpy is different from apomixis. In parthenocarpy, the fruit is produced without the fertilization of the female gamete. It is used for the production of fruits without seeds such as banana and grapes for commercial purposes. Apomixis is the process in which the seeds are produced without fertilization but the process occurs in the female reproductive tract of the plant. In this, the megaspore mother cell does not undergo meiosis. It is used for the commercial production of hybrid varieties and in the production of virus-free varieties.	**1** **1** **1**
Q.12	Implantation Zygote divides rapidly by mitotic division called cleavage and as a result 2 4 8 16 daughter cells are produced which are termed as blastomeres.Embryo with 8–16 blastomeres is called a morula. The morula changes into a large mass of cells called blastocyst which passes further into the uterus. Blastomeres in the blastocyst are arranged into an outer layer called trophoblast and an inner group of cells attached to trophoblast called inner cell mass.The trophoblast layer gets attached to the cells of the endometrium and the inner cell mass gives rise to the embryo.The cells of endometrium divide rapidly and cover the blastocyst. So the blastocyst gets embedded in the endometrium of the uterus called implantation leading to pregnancy. **OR**	**1/2× 6=3**

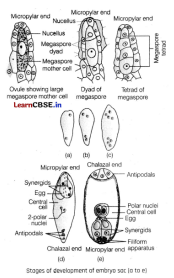
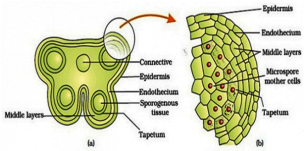
		
Q.13	(a) Corn: Wind. Numerous flowers are packed in an inflorescence; the tassels seen in the corn cob are the stigma and style which wave in the wind to trap pollen grains. (b) Water hyacinth: Insects or wind. In water hyacinth the flowers emerge above the level of water and are pollinated by insects or wind as in most of the land plants. (c) Vallisneria: Water, In Vallisneria - the female flower reaches the surface of water by the long stalk and the male flowers or pollen grains are released onto the surface of water. They are carried passively by water currents; some of them eventually reach the female flowers and the stigma.	**1** **1** **1**

SECTION-D

Q.14	A. Couple should go for IUDs. These devices are inserted by doctors or expert nurses in the uterus through vagina. B. Yes, Administration of progestogens or progestogen-estrogen combinations or IUDs within 72 hours of coitus have been found to be very effective as emergency contraceptives. C. Non-medicated IUDs, Copper releasing IUDs and hormone releasing IUD. D. Non-medicated IUDs eg. Lippes's loop. Copper releasing IUDs eg.CuT, Cu7, Multiload 375,Hormone releasing IUDs eg.Progestasert, LNG-20. (Any one example of each type)	½ **1** **1** ½+ ½+ ½

SECTION-E

Q.15	In angiosperms, the process of megasporogenesis starts inside the nucellus of the ovule. During megasporogenesis, the Megaspore Mother Cell (MMC) undergoes meiosis resulting in the production of four megaspores. Out of the four megaspores, only one is functional while the other three degenerate. The functional megaspore undergoes mitosis to form two nuclei, which migrate to opposite poles**,** forming a 2-nucleate embryo sac. Further, mitotic divisions lead to the formation of 4-nucleate and 8-nucleate stages of the embryo sac. In these mitotic divisions, nuclear division is not followed by cell division. After the 8-nucleate stage, cell walls are laid down and a typical female gametophyte or embryo sac is formed. Among the 8 nuclei, 6 are enclosed by cell walls and organised into cells, while the remaining 2 nuclei (polar nuclei) are situated above the egg apparatus in a large central cell. Out of the six cells, three are grouped at the micropylar end and constitute the egg apparatus. It is made up of two synergids and one egg cell. The other three cells are located at the chalazal end and are called antipodals. Thus, a typical angiosperm embryo sac after maturity is 8-nucleate and 7-celled	**1/2× 3=6** **2**

	 Stages of development of embryo sac (a to e)	
Q.16	(i)  (ii) Tapetum is the inner nourishing layer of microsporangium wall. The cells of tapetum have dense cytoplasm and more than one nucleus. These cells nourish the developing pollen grains. (iii) (a) The outer exine layer of pollen grain is highly resistant because of sporopollenin. It is an organic material which can withstand harsh conditions, action of alkalis and acids. No enzyme can degrade sporopollenin. Thus, pollen grains are well-preserved as fossils. (b) Pollen grains are rich in nutrients. So, used by people as health tablets or food supplements	**2** **1** **1** **1**