Extra exercises on Chap.1

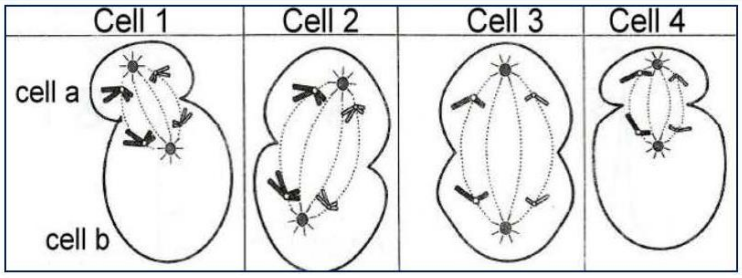
Exercise 2 Gametogenesis

Question - 20: **Gametogenesis** **Tn-update**

Document 1 shows simplified schemes of four sexual cells labeled as 1, 2, 3 and 4 in a division in the course of gametogenesis.

1- Identify each of the given sexual cells.

2- Referring to your knowledge, precise the possible or certain fate of each of the daughter cells a & b of cell 1.



Ch-1-no.20- **Gametogenesis.**

1- **Cell 1:** oocyte I at the end of telophase I, since there is constriction that will lead to an unequal division of the mother cell into two daughter cells, each one of them possesses n chromosomes of two chromatids each.

Cell 4: oocyte at the end of telophase II, since there is constriction that will lead to an unequal division of the mother cell into two daughter cells, each one of them possesses n chromosomes of one chromatid each.

Cell 2: spermatocyte I at the end of telophase I, since there is constriction that will lead to an equal division of the mother cell into two daughter cells, each one of them possesses n chromosomes of two chromatids each.

Cell 3: spermatocyte II at the end of telophase I, since there is constriction that will lead to an equal division of the mother cell into two daughter cell,s each one of them possesses n chromosomes of one chromatid each.

2- The division of cell 1 (primary oocyte) will lead to the production of the first polar body and the secondary oocyte.

The first polar body could or could not divide and in both cases, the polar body (ies) die(s) and degenerate(s).

The secondary oocyte will enter in the second meiotic division and blocked at metaphase II. If fertilization does not take place the oocyte survives for 24 hours and then it dies and degenerates while in case of fertilization the oocyte will transform into an ootid and then into a zygote that is at the origin of a new born.

Exercise 3 spermatogenesis and Oogenesis

Question - 21: **Spermatogenesis and Oogenesis** By Mr. Jameel Kobaisy

Meiosis is the process by which gametes are formed & is called **gametogenesis**. Literally "creation of gametes."

1. Fill in the blanks with the appropriate word.

Meiosis is of 2 divisions: one that produces cells of "n" chromosomes of 1 chromatid and is called (1)…….. division and the other that produces "n" chromosomes of 2 chromatids and is called (2)…….. division. The specific type of meiosis that forms sperm is called (3)……., while the formation of egg cells, or (4)……., is called (5)……

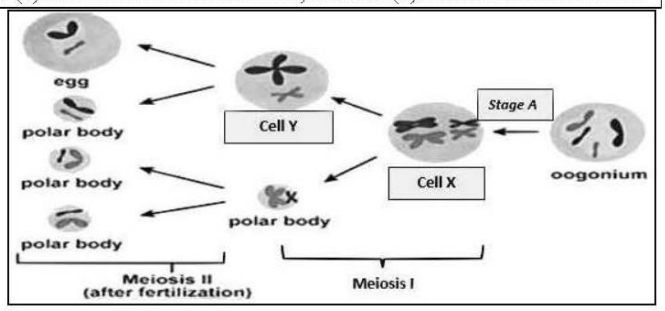
Document 1: Ova Production.

Figure 1 shows in brief the process of production of ova. →

2-1. Name cells X and Y, and indicate stage A.

2-2. Describe figure 1 in few lines.

3. Will the female use the polar bodies formed? What will happen to them then?



Ch.1.no.21 By Mr Jameel Kobysy

1- (1) : Equational, (2): Reductional, (3): Spermatogenesis, (4): Ova, (5): Oogenesis, (6):Meiosis

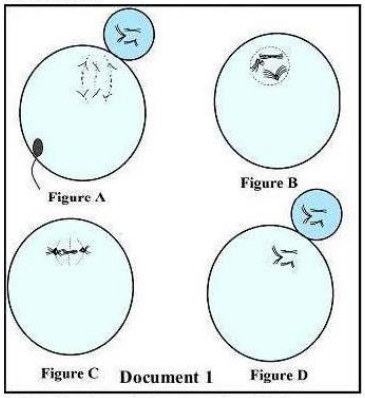
2-1. Cell X: Primary Oocyte (or oocyte 1) Cell Y: Secondary Oocyte (or oocyte 2) Stage A: Growth period.

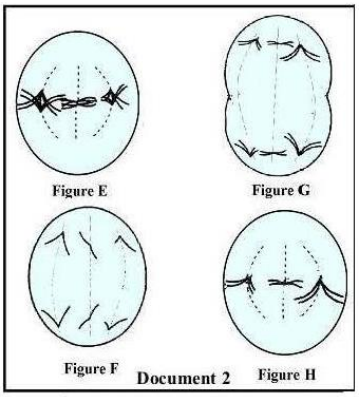
2-2. After the growth period, Oogonium (2n single chromosomes) is transformed into primary oocyte (2n double chromosomes). Then, this primary oocyte is divided into secondary oocyte (1n double chromosomes) and a polar body (1n double chromosomes) (smaller in size) by means of meiosis I. The secondary oocyte is then divided into an egg cell and a polar body (smaller in size) (1n single chr each) and the polar body is divided into 2 polar bodies (1n single chr each) by the means of meiosis II.

3- No, the polar bodies will die later.

Exercise 4 Gametogenesis

The figures of documents 1 and 2 represent the germ cells in division at the level of the same step of gametogenesis in the man and woman. For the simplification of the phases, they represented 3 pairs of chromosomes.





1- Identify, for each document 1 and 2, the type of gametogenesis.

2- Specify the phase of each figure in gametogenesis illustrated by the two documents.

3- Give the chronological order of the figures given in each document.

4- Complete the two tables.

Doc-1- Figure	A	B	C	D
Name of Germinal Cell				
Division Phase				
Number & state of chromosomes				
Location				

Doc-2- Figure	E	F	G	H
Name of Germinal Cell				
Division Phase				
Number & state of chromosomes				
Location				

Ch-1-no.23 By Mr.Haitham El-Munla

1. Doc.1 represents oogenesis since there is production of small polar bodies.
Doc.2 represents spermatogenesis since no production of polar bodies

2. A : Anaphase 2 since there is separation of sister chromatids & fertilization took place .
B : Prophase 1 because first polar body is not produced yet.
C : Metaphase 1 since each chromosome pair lines up to form equatorial plate .
D : Telophase 1 because of the production of 2 cells .
E : Metaphase 1 since tetrads form the equatorial plate
G : Anaphase 1 since tetrads separate
F: Anaphase 2 because separation of sister chromatid
H : Metaphase 2 because each chromosome lines up to form equatorial plate

3. Figure 1 : B-C-D-A ; Figure 2 : E-G-H-F

4. Table…

Doc-1- Figure	A	B	C	D
Name of Germinal Cell	oocyte II	Oocyte I	Oocyte I	Oocyte II
Division Phase	Meiosis II	Meiosis I	Meiosis I	Meiosis II
Number & state of chromosomes	3;single chromatid	6: Double chromatid	6;double chromatid	3;single chromatid
Place of Existence	Ovaries	Ovaries	Ovaries	Ovaries
Doc-2- Figure	E	F	G	H
Name of Germinal Cell	spermatocyte I	Spermatocyte II	spermatocyte I	Spermatocyte II
Division Phase	Meiosis I	Meiosis II	Meiosis I	Meiosis II
Number & state of chromosomes	6;Double chromatid	3;single chromatid	6;Double chromatid	3;Double chromatid

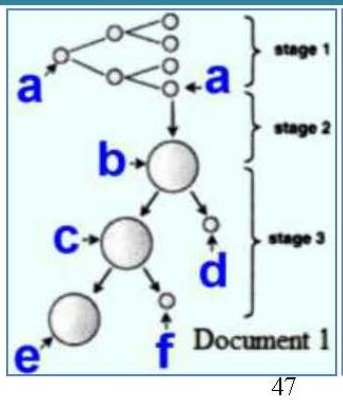
Exercise 5 Oogenesis

Question - 22:

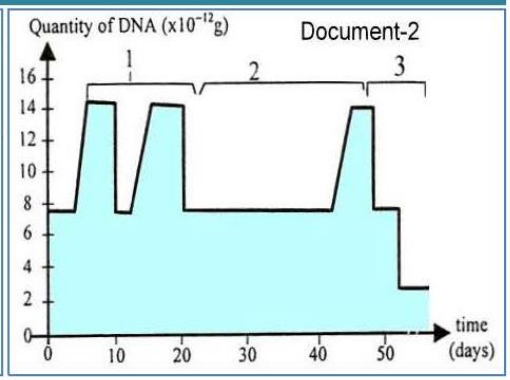
Document 1 presents the stages of oogenesis in a woman.

1- Name the cells indicated by arrows.

2- Name & explain briefly the events that occur in every stage of document 2.



Document 1



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ch.1 no.22

1- a.Oogonia, b.Oocyte I, c.Oocyte II, d.1st polar body, e.Ootid or ovum, f.2nd polar body.

2- **Stage 1:** Multiplication phase: Oogonia multiplicates by mitosis.

Stage 2: Growth phase oogonia develop in size by duplicating its DNA by interphase.

Stage 3: Maturation. Oocyte I undergoes meiosis I to produce oocyte 2 & 1st polar body then oocyte 2 under goes meiosis 2 if fertilized to produces ootid.