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ASSIGNMENT QUESTIONS:

1. Discuss Ovulation.
2. Differentiate between meiosis 1 and meiosis 2.
3. Discuss the stages involved in fertilization.
4. Differentiate between monozygotic twins and dizygotic twins.

ANSWERS;

1. OVULATION; This is the release of oocyte from the ovarian cycle. This event occurs when the ovarian follicles rupture and release the secondary oocyte ovarian cells. It is after this event that fertilization occurs, that is, after the egg is released, it travels down to the fallopian tube where it is fertilized by a sperm. Ovulation is triggered by a surge of LH [luteinizing hormone] production. For oocytes to be released, Luteinizing Hormone [LH] causes two events; Collagenase activity and prostaglandin levels are increased causing collagen fibers surrounding the follicles to digest and contractions of local muscle in the ovarian wall respectively. During ovulation, the walls of the uterus also thicken to prepare for a fertilized egg, but if the egg is not fertilized, the uterine lining is shed about two weeks later, causing menstrual flow to begin. Ovulation typically lasts one day and occurs in the middle of a woman’s menstrual cycle which is why it is known as “middle pain”.
2. Differences between meiosis 1 and meiosis 2.

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| S/N | MEIOSIS 1 | MEIOSIS 2 |
| 1. | It is a heterotypic division. | It is a homotypic division. |
| 2. | Crossing over and genetic recombination occurs. | Crossing over and genetic recombination doesn’t occur. |
| 3. | Homologous chromosome separates from each other. | Sister chromatids separate. |
| 4. | 2 diploid daughter cells are produced. | 4 haploid daughter cells are produced. |
| 5. | Pair of homologous chromosomes arranges in metaphase plate. | Single chromosomes arrange in metaphase plate. |
| 6. | Prophase has 5 sub-phases. | Prophase does not have sub-phases. |
| 7. | It has a long duration. | It has a short duration. |
| 8. | Chiasma formation occurs. | Chiasma formation doesn’t occur. |

1. Stages of Fertilization;
2. Passage of sperm through corona radiata; For the sperm to pass through the corona radiata, the cell must be capacitated which is characterized by the removal of glycoproteins and seminal plasma proteins. The dispersal of the follicular cells results mainly from the enzyme released from the acrosome of the sperm.
3. Penetration of zona pellucida; This is another important phase. After the sperm penetrates the zona pellucida, the sperm moves forward to the plasma membrane of the oocyte covered by cortical granules [which sends information to the zona pellucida to prevent more sperm from passing thereby preventing polyspermy]. The zona reaction is believed to result from the action of lysosomal enzymes released by the cortical granules near the plasma membrane of the oocyte.
4. Fusion of plasma membrane of oocyte and sperm; The region of the head and tail enters into the cytoplasm leaving the plasma membrane behind. Thereafter the plasma or cell membrane of the oocyte and sperm fuses.
5. Completion of second meiotic division of oocyte and formation of female pronuclues; The second meiotic division is completed after the oocyte is penetrated by the sperm, then a mature oocyte and a second polar body are formed. Also the nucleus of the mature oocyte becomes the female pronucleus.
6. Formation of male pronucleus; The nucleus of the sperm enlarges and becomes a male pronucleus inside the oocyte then the tail of the sperm degenerates. The female and male pronucleus fuses to become a ZYGOTE.
7. Differences between monozygotic and dizygotic twins.

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| S/N | Monozygotic Twin | Dizygotic Twin |
|  1. | Monozygotic twins are developed by the splitting of a fertilized embryo into two. | Dizygotic twins are developed by two separate simultaneous fertilization events. |
|  2. | They have the same sex. | They can have different sexes. |
|  3. | They share the same placenta. | They don’t share the same placenta. |
|  4. | They share the same amniotic sac. | They don’t share the same amniotic sac. |
|  5. | They share the same chronic sac. | They don’t share the same chronic sac. |
|  6. | Appearance is extremely similar but may be affected by environmental factors. | Appearance is similar as any other siblings. |
|  7. | They are genetically identical. | They are genetically non-identical. |
|  8. | Blood types are the same. | Blood types are different. |
|  9. | They are also called identical twins. | They are also called non-identical or fraternal twins. |