1. Ovulation is the release of an oocyte from an ovarian follicle,few days before ovulation under the influence of follicle stimulating hormone and luteinizing hormone the secondary follicle grows rapidly to become graafian follicle which is another name for mature oocyte,coinciding with the development of vesicular follicle there is an abrupt increase in luitenizing hormone that causes the primary oocyte to complete meiosis 1 and the follicle to enter pre-ovulatory mature vesicular stage. Meiosis2 is also initiated but is arrested in metaphase 2, three hours before ovulation. In the meantime the surface of the ovary begin to bulge on the apex and an avascular spot known as stigma appears,for the oocyte to be expelled two events must occur caused by the luitenizing hormone.

-Increase In collagenase activity

-Increase In prostaglandin level,thus causing muscular contraction in the ovarian wall.

2.

|  |  |
| --- | --- |
| **Meiosis I** | **Meiosis II** |
| Chiasmata is formed | Chiasmata is not formed |
| Crossing over occurs | Crossing over does not occur |
| Two daughters cells are formed at the end of the phase | Four daughter cells are formed |
| Synapsis occurs | Synapsis Does not occur |

3. (i) Passage of the sperm through corona radiata surrounding the sons pellucida: The dispersal of these follicular layers appears to result from the action of the enzyme hyaluridinase released from the acrosome of the sperm.

(ii) Penetration of the zona pellucida surrounding the oocyte:Sperms forms a pathway through the zona pellucida which is believed to be as a result of the action of the enzymes, such as the esterases,acrosin causes lysis of the zona pellucida,thereby forming a path for thesperm to follow the oocyte. N/B once the sperm penetrates the zona pellucida a zona reaction occurs to prevent other sperm from entering.

(iii) Fusion of the plasma membranes of the oocyte and sperm: They fuse and break down at area of fusion.The head and the tail of the sperm enters the cytoplasm of the oocyte,but the sperms plasma membrane remains behind.

(iv)Completion of the second meiotic division of oocyte and formation of female pronucleus: After entering the sperm the oocyte which has been arrested in metaphase of the second meiotic division completes this division and forms a mature oocyte,the nucleus of the oocyte becomes the female pronucleus.

(v)formation of male pronucleus: Within the cytoplasm of the oocyte,the nucleus of the sperm enlarges to form male pronucleus and the tail of the sperm degenerates.

(Vi)Membranes of pronuclei break down the chromosome condense and become arranged for mitotic cell division,the first cleavage division.The combination of 23chromosomes in each pronucleus result in the formation of a zygote with 46 chromosomes.

4.

|  |  |
| --- | --- |
| **Monozygotic Twins** | **Dizygotic Twins** |
| Developed from a single egg which was fertilized by a single sperm cell | Developed from two eggs fertilized by two different sperm cells |
| Two fetuses grow in the same placenta | Two fetuses grow in two different membranes |
| Have almost identical genetic profile | Completely different genetic profile May be of the same or opposite sex |
| Always of the same sex | May look alike or different; |
| May have the same physical and mental characteristics | may behave similarly or differently |
| Also called “identical twins” | Also called “fraternal twins” |