# Answers

## 2.15 Female Reproductive System

554. a + b + c + d – e +

555. a + b – c – d – e +
The ovary of a young girl, who has not yet reached puberty, contains primordial follicles, developing primary follicles and atretic follicles. The primordial follicles appear in the embryonic period and their number is already determined at birth. These follicles can only develop further to become mature (Graafian) follicles at puberty when ovulation begins.

556. a + b + c + d + e -
The mature of Graafian follicles contain oocytes, which are surrounded by the zona pellucida and corona radiate. Other features of the mature follicles are the cumulus oophorus and a follicular cavity filled with fluid (liquor folliculi). Surrounding the follicle are the theca interna and externa.

557. a + b + c + d + e +

558. a + b + c + d + e +

559. a – b + c + d – e +
Corpora lutea, as their name suggests, are yellow. They develop from secondary follicles after ovulation and during the second half of the menstrual cycle secrete the hormone, progesterone. Corpora lutea develop under the influence of luteininzing hormone (LH) from the adenohypophysis. The granulose lutein cells, which develop from the granulose cells of the mature follicle, are rich in lipids (as are all steroid-secreting hormone cells). They also contain the pigment, lipochrome, which is responsible for the yellow color of the corpus luteum. In common with all endocrine glands, the corporate lutea have a rich blood vascular supply.

560. a – b – c + d + e +
Corpora albicantes develop in the site of degenerating corpora lutea. If pregnancy does not occur, corpora lutea degenerate and are replaced by a scar of fibrous connective tissue. In fresh preparations, these corpora albicantes are white, as the name suggests. Corpora albicantes are very common in the ovaries of post-menospausal women.

561. a + b – c – d + e +

562. a + b – c + d + e +

The zona pellucida of Graafin follicles is an acellular, homogeneous layer containing PAS-positive glycoproteins. The zona pellucida is acidophilic in preparations stained with hematoxylin and eosin.

563. a – b – c + d – e -
The normal site of fertilization of the oocyte by spermatozoa is in the oviduct.

564. a + b – c + d + e -
Most of the oocytes present at birth are destined to degenerate. This involution or atresia begins even in fetal ovaries and is very pronounced at birth and during the period of puberty. Atresia can occur in follicles at any stage of their development. Every month a number of follicles are primed to develop, but usually only a single follicle reaches maturity and the others become atretic. Examination of ovaries at any stage of the life history form fetus to several years after menopause will show atretic follicles.

565. a + b + c – d – e -

566. a + b – c – d + e +
The oviduct wall has a mucosa, smooth muscle layer and serosa. The oviduct is lined with simple, columnar, ciliated epithelium.

567. a – b + c + d – e -
Stratified squamous epithelium lines the vagina and that portion of the cervix that projects into the vagina.

568. a – b + c – d – e -
Usually only one spermatozoon penetrates the oocyte. This is followed by rapid changes in the zona pellucida, which are believed to prevent the entry of further spermatozoa.

569. a + b + c + d + e +
The endometrium has a constantly changing histological appearance throughout the menstrual cycle. Morphological and functional changes in the endometrium depend on the influences of the hormones, estrogen and progesterone. The endometrium has a basal layer, which is fairly constant, and a functional layer, which reaches its greatest development when the uterus is most prepared for implanation.

570. a + b + c - d + e -

571. a + b + c – d + e -
Coiled arteries are found in the functional portion of the endometrium. They develop a new in each menstrual cycle and are especially well developed in the second half of each menstrual cycle when the endometrium is also well developed. At the end of the secretory phase the coiled arteries contract and

constrict blood flow resulting in ischemia and the breakdown of the surrounding endometrial surface. The functional layer, together with its glands and terminal parts of the coiled arteries are sloughed off and with the associated pools of blood results in the menstrual flow or monthly 'period'. Coiled arteries are not found in the cervix uteri. At menstruation the levels of both progesterone and estrogen are very low. The blood discharged during menstruation does not clot. The basal layer of the endometrium does not undergo major cyclic changes.

572. a – b + c + d – e +
The cervix uteri have simple columnar secretory epithelium with large, branching mucous glands. Its lacks a well-develop muscle layer. During childbirth the cervix dilates under t he influence of the hormone relaxin, which is believed to be produced in the ovary.

573. a – b – c + d + e –
Common contraceptive pills have steroid analogues of progesterone typically combined with estrogen.

574. a – b + c – d – e +
The adenohypopysis secrets the gonadotropins, FSH, LH under the influence of Gn – RH from the hypothalamus. The pacenta is also a source of gonadotropins (hCG).

575. a – b – c + d + e -
Androgens are formed by the theca interna cells of developing follicles. These are converted to estrogens by granulose cells. Theca lutein cells of corpora lutea, in addition to progesterone, also produce estrogen. The placenta produces estrogen (mainly as estriol). The adrenal cortex produces some androgens, but not estrogen. The vagina has no glands and is non-secretory.

576. a – b – c – d – e +
Nabothian cysts or follicles are found in the cervix uteri and develop from cervical glands that have become closed off.

577. a + b - c + d – e +
The vagina has no glands of its own. It has an irregular surface composed of rugae lined by stratified, squamous, glycogen-rich epithelium.

578. a – b + c – d + e +
In vagina smears taken during the premenstrual phase there are a relatively large number of intermediate cells with folded edges, abundant mucus and neutrophils.

579. a + b + c + d + e +
The functions of the placenta are many and include the supply of nutritive material, hormones and oxygen to the developing fetus and the removal of waste

products. The placenta is also a source of several hormone including chorionic gonadotropin, which is detectable in the urine of pregnant women. The identification of chorionic gonadotropin in urine or blood forms the basis of some pregnancy tests.

580. a – b + c + d + e -
The fetal blood does not mix with the maternal blood. The placenta is constructed in such a way as to allow an exchange of metabolites and antibodies (in some cases) from the maternal blood to the fetal blood. The floating villi from part of the fetal-maternal blood barrier. Towards the end of pregnancy the placenta barrier separating fetal from maternal blood is very thin.

581. a + b – c + d - e -

582. a – b + c + d + e +
The fetal part of the placenta is built from the chorionic plate and floating villi. The maternal part of the placenta includes the basal plate (deciduas basalis), endometrial glands, placenta septa and the intervillous space. The intervillous space is filled with maternal blood, which bathes the villi.

583. a – b + c + d + e +
Human chorionic gonadotropin (hCG) is only secreted during pregnancy. It is active in stimulating the development of the corpus luteum of pregnancy in the maternal ovary. hCG is detectable in the urine of pregnant women and is the factor whose presence can be used in pregnancy tests to determine if a woman is pregnant or not. hCG is secreted by the placenta syntiotrophoblast.

584. a – b + c + d + e -
Decidual cells are large polygonal vacuolated cells rich in lipid droplests and glycogen. They are derived from the maternal part of the placenta, mainly from the deciduas basalis. These decidual cells are much more common in the first half of pregnancy than in the later stages. The functions of decidual cells in still not known.

585. a – b + c + d + e +
The secretory units of mammary glands are not well developed in juveniles. They reach their potential for development at puberty and grow during pregnancy, with the maximum development being reached in nursing mothers. During suckling the secretory units of mammary glands are induced to synthesize milk under the influence of the adenohypophyseal hormone, proclatin. The secretory units of mammary glands are surrounded by myoepithelial cells, which on contraction cause milk ejection.

586. a + b + c + d + e +
Nipples have stratified keratinized, squamous epithelium, elastic fibers, collagen fibers and smooth muscle.

587. a – b + c – d – e +
Each breast contains many separate compound glands that open into its own separate lactiferous duct. Each duct has its own individual opening in the nipple surface. The lactiferous ducts are lined with two layers of columnar epithelial cells. Near the base of the nipple the ducts are expanded to form lactiferous sinuses.

588. a – b + c + d + e -
During active lactation secretory cells of mammary glands are flat or cuboid. The basal part of the cells is rich in rough endoplamic reticulum, whereas the apical part of the cells contains abundant lipid droplets and smaller protein granules. Milk is stored in the lumina of the glands and to a cerain degree also in the lactiferous ducts.