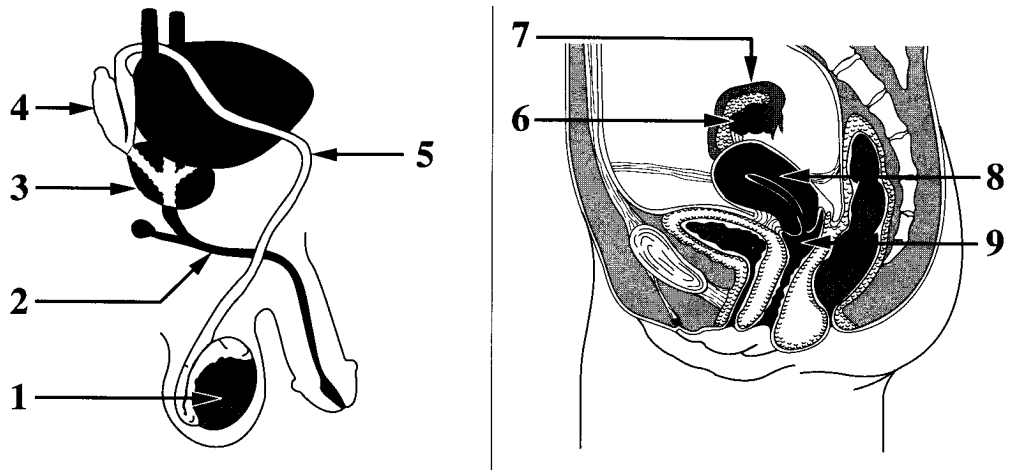
Bio 30 Reproduction Exams

Use the following information to answer the next two questions.

The Male Reproductive System **The Female Reproductive System**



Numerical Response

1. Provide the number of the reproductive structure that is **directly** affected by each technology named below.

(Record your **four-digit answer** in the numerical-response section of the answer sheet.)

Reproductive structure:	_____	_____	_____	_____
Technology:	Vasectomy	Tubal ligation	Castration	Use of an intrauterine device (IUD)

1. The birth control pill prevents the maturation and release of ova. The structure that is directly affected by the birth control pill is

A. structure 6, because ova are produced by follicles in this organ
B. structure 6, because this organ will secrete excess estrogen and progesterone
C. structure 8, because implantation will not occur in this organ unless ovulation occurs
D. structure 8, because follicular development is controlled by feedback from this organ

2. The vas deferens is most similar in function to which female reproductive organ?

A. Ovary
B. Uterus
C. Vagina
D. Fallopian tube

Use the following information to answer the next question.

Possible Effects of Testosterone
1 Inhibits skeletal muscle development
2 Enhances skeletal muscle development
3 Inhibits development of body hair
4 Promotes development of body hair
5 Inhibits gametogenesis
6 Stimulates gametogenesis
7 Enhances growth of the larynx
8 Inhibits growth of the larynx

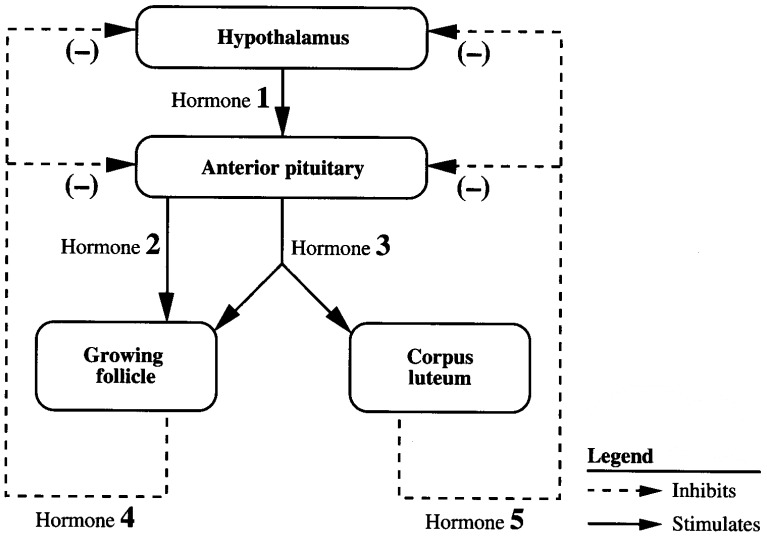
Numerical Response

2. Select all the correct effects of normal levels of testosterone in an adolescent male. (Record your **answer in lowest-to-highest numerical order** in the numerical-response section of the answer sheet.)

Answer: _____

Use the following information to answer the next two questions.

Regulation of Reproductive Hormone Secretion



3. Which row correctly identifies hormones 2, 3, 4, and 5?

Row	Hormone 2	Hormone 3	Hormone 4	Hormone 5
A	FSH	LH	Estrogen	Progesterone
B	LH	FSH	Estrogen	Progesterone
C	FSH	LH	Progesterone	Estrogen
D	LH	FSH	Progesterone	Estrogen

4. According to the diagram, secretion of hormone 1 is likely inhibited by
- **A.** increased levels of gonadotropins in the blood
- **B.** decreased levels of gonadotropins in the blood
- **C.** increased levels of ovarian hormones in the blood
- **D.** decreased levels of ovarian hormones in the blood

5. RU-486 is a drug that inhibits the action of progesterone. Hormones called prostaglandins cause the cervix to soften and dilate. Administering RU-486 and prostaglandins to a woman during pregnancy would likely cause
A. expulsion of the fetus
B. accelerated fetal development
C. a decrease in secretion of HCG by the pituitary
D. an increase in the development of the endometrium

6. A home pregnancy test that is positive reveals the presence of a hormone in urine. This hormone is only present in the first trimester of pregnancy. Which hormone is detected by this home pregnancy test?
A. Progesterone
B. Oxytocin
C. Relaxin
D. HCG

7. During pregnancy, menstruation is prevented by the action of
A. estrogen, initially secreted by the ovaries and later by the pituitary gland
B. estrogen, initially secreted by the corpus luteum and later by the placenta
C. progesterone, initially secreted by the ovaries and later by the pituitary gland
D. progesterone, initially secreted by the corpus luteum and later by the placenta

8. A poorly developed uterine lining mainly affects the
A. lifespan of the unfertilized egg
B. implantation of the fertilized egg
C. ability of the sperm to fertilize the egg
D. development of the egg within the ovary

Use the following information to answer the next question.

Some Events that Occur During Birth

1 The baby is expelled from the uterus.
2 Secretion of progesterone decreases and the release of oxytocin increases.
3 Dilation of the cervix increases and amniotic fluid is released.
4 The placenta separates from the endometrium and is expelled.

Numerical Response

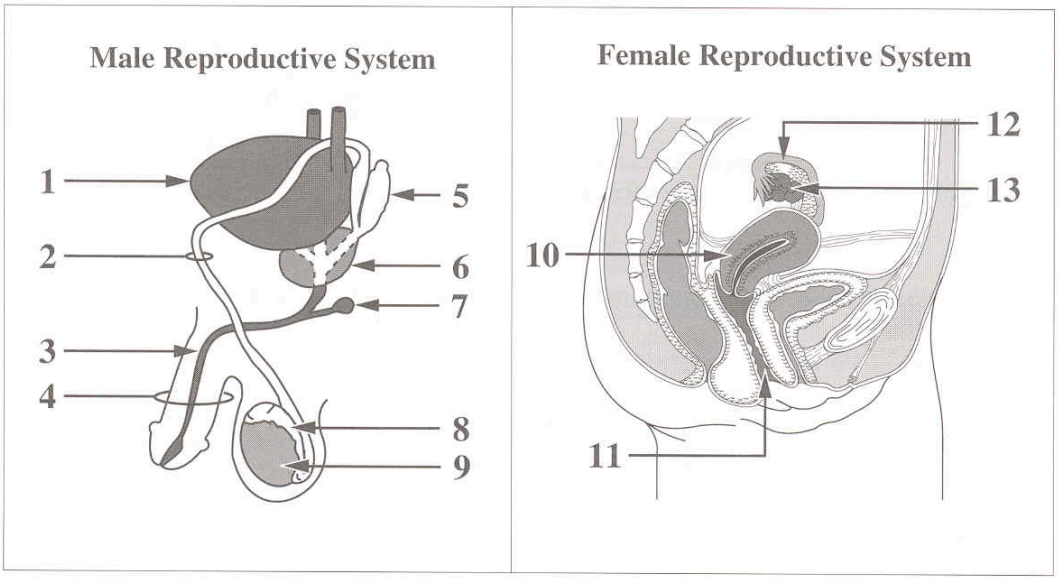
3. Provide the correct sequence of these four events that occur during birth.

(Record your **four-digit answer** in the numerical-response section of the answer sheet.)
Answer: _____

9. Infection by *Chlamydia* bacteria may cause tissue scarring that results in blockage of the Fallopian tubes. Without treatment, which event will still occur in an individual with this condition?

A. Ovulation
B. Parturition
C. Fertilization
D. Implantation

Use the following information to answer the next two questions.



Numerical Response

2. What are the structures that are responsible for the **production** of the components of semen?

(Record your **answer in lowest-to-highest numerical order** in the numerical-response section of the answer sheet.)

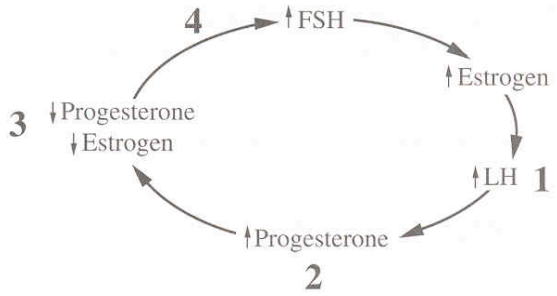
Answer: _____

10. The structures that are **directly** affected by hormones secreted from the pituitary gland are structures

A. 6, 9, and 10
B. 9, 10, and 13
C. 8, 10, and 11
D. 8, 11, and 13

Use the following information to answer the next question.

Hormones of the Menstrual Cycle



Legend: ↑ increasing levels of
↓ decreasing levels of

11. What point on the diagram is **best** matched with the correct event?
- **A.** Point 1—ovulation
- **B.** Point 2—menstruation
- **C.** Point 3—formation of the follicle
- **D.** Point 4—formation of corpus luteum

Use the following information to answer the next question.

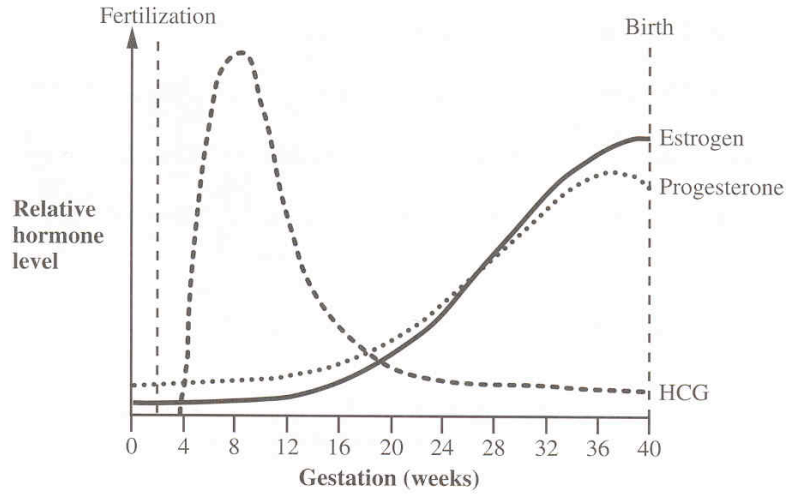
Before eggs are harvested for *in vitro* fertilization, hormone supplements are given to the egg donor to ensure that mature ova will be available. Harvested eggs are fertilized and inserted into the recipient's uterus.

12. Which hormone, if given to the egg donor, would promote the growth and development of ova?
- **A.** LH
- **B.** FSH
- **C.** Estrogen
- **D.** Progesterone

13. During the process of implantation, the enzymes secreted by the
- **A.** ovum digest the zygote membrane
- **B.** sperm digest the zygote membrane
- **C.** blastocyst digest a portion of the endometrium
- **D.** blastocyst digest a portion of the corpus luteum

Use the following information to answer the next question.

Hormone Levels in Blood Plasma Before and During Pregnancy



14. The increasing level of HCG from the time of fertilization until week 8 serves to
- **A.** maintain the function of the corpus luteum
- **B.** determine the sex of the developing embryo
- **C.** inhibit the development of the endometrium
- **D.** direct the processes of ovulation and fertilization

15. Removal of the mother's ovaries before the seventh week of pregnancy leads to a miscarriage. After 12 weeks, removal of the ovaries usually has no effect on pregnancy. An explanation for these observations is that
- **A.** after 12 weeks, the endometrium is easily shed
- **B.** after 12 weeks, the placenta maintains the pregnancy
- **C.** the follicle remains well developed for at least 12 weeks
- **D.** implantation is not firmly established until the 12th week

Use the following information to answer the next question.

Events That Occur During Breast Feeding
(Arranged in Random Order)

1 Release of milk
2 Release of oxytocin
3 Suckling action of the baby
4 Stimulation of sensory neural pathways from the breast to the hypothalamus-pituitary complex

Numerical Response

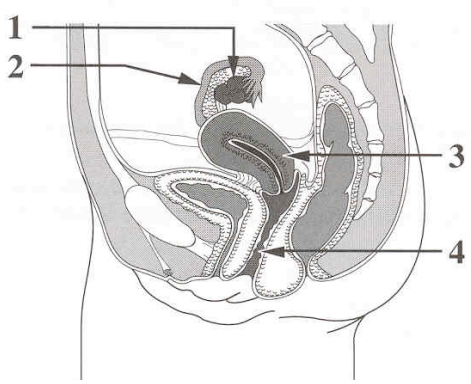
4. Sequence the events that occur during breast feeding.

(Record your **four-digit answer** in the numerical-response section of the answer sheet.)

Answer: _____, _____, _____, _____ (2 possible answers)

Use the following information to answer the next two questions.

Female Reproductive System



Endometriosis
In some women, endometrial cells migrate from the uterus to other places in the body, such as surfaces of reproductive organs and organs of the urinary system. This misplaced endometrial tissue responds to hormones in the blood in the same way as the normal endometrium. This causes pain and may severely damage the organ to which the tissue is attached. Women who have endometriosis do not experience these symptoms during pregnancy. Treatment for endometriosis includes removing excess tissue with lasers or using hormone therapy to mimic pregnancy.

16. Which hormones would be used in the hormone therapy treatment of endometriosis?

A. FSH and LH
B. LH and estrogen
C. FSH and progesterone
D. Progesterone and estrogen

17. The **process of fertilization** would be directly affected by scarring resulting from endometriosis in structure

A. 1
B. 2
C. 3
D. 4

18. At puberty, the LH in the human male **directly**

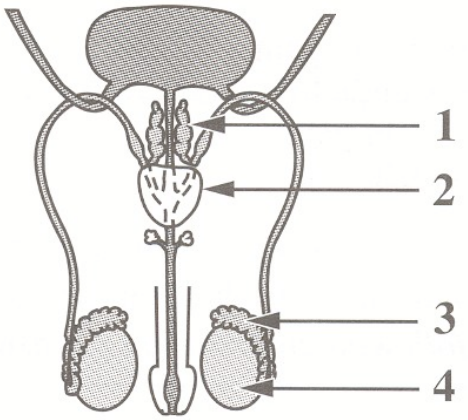
A. inhibits the production of sperm
B. stimulates the production of testosterone
C. causes the growth of facial and body hair
D. stimulates the maturation of the seminiferous tubules

23. If a pregnant woman failed to produce oxytocin, what would be the result?

A. Urination would be more frequent.
B. ADH levels in the bloodstream would drop.
C. Uterine contractions would not begin for labour.
D. Oxytocin levels would increase in the bloodstream.

Use the following information to answer the next question.

Male Reproductive System



24. The structure that may function both as a site for spermatogenesis and as an endocrine gland is labeled

A. 1
B. 2
C. 3
D. 4

Use the following information to answer the next question.

An unusual and rare form of the disease cystic fibrosis results in the absence of the vas deferens in males.

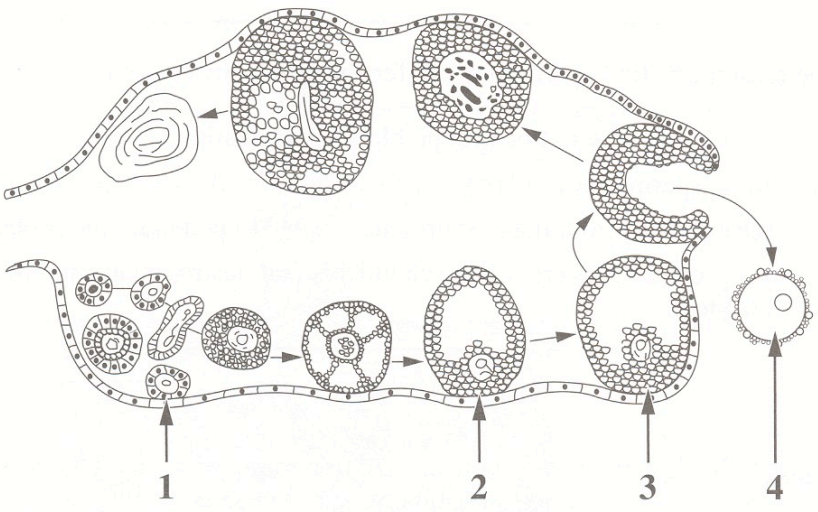
—from *Henahan*

25. When this occurs, infertility results because of

A. decreased spermatogenesis
B. an inability to maintain an erection
C. decreased secretions of alkaline buffers
D. the failure of sperm to reach the urethra

Use the following information to answer the next two questions.

Composite Diagram of a Human Ovary



This diagram shows the sequence of events in the development of a follicle in one reproductive cycle of a non-pregnant female.

26. The part of the diagram that represents the follicle just before day 14 of an average ovarian cycle is labelled

A. 1
B. 2
C. 3
D. 4

Use the following information to answer the next question.

Microscopic examination has revealed protective layers surrounding the oocyte. The first sperm to reach the oocyte is usually not the one to fertilize it.

27. The reason this first sperm may not fertilize the oocyte is that

A. its nucleus may not be acceptable for fertilization
B. some sperm produce enzymes that fail to break down the protective layers
C. the enzymes from many sperm are needed to penetrate the protective layers
D. the protective layers secrete chemicals that destroy many sperm that contact the oocyte

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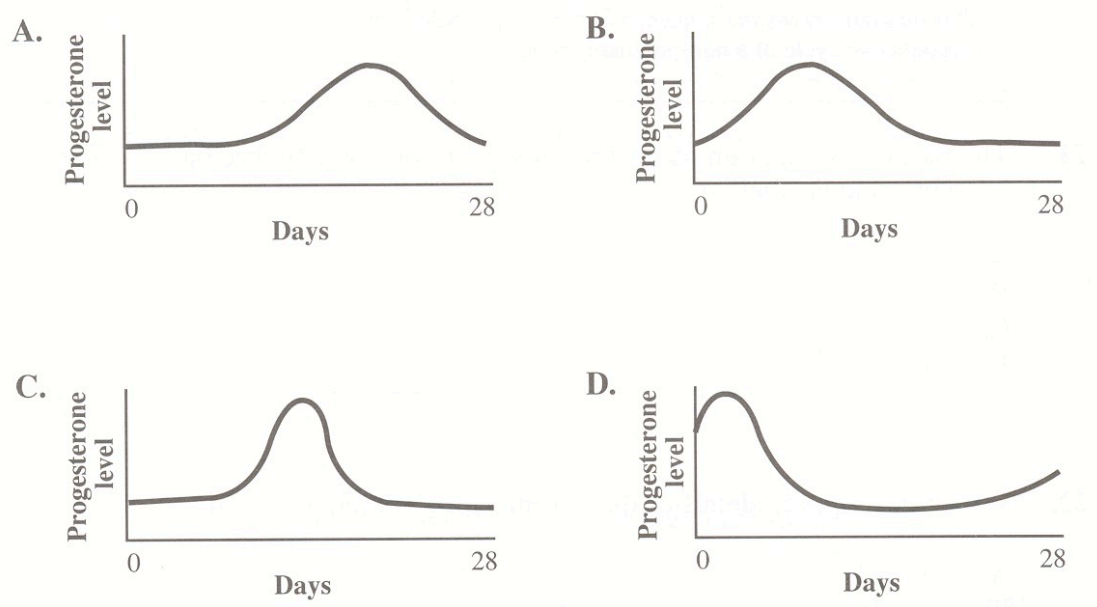
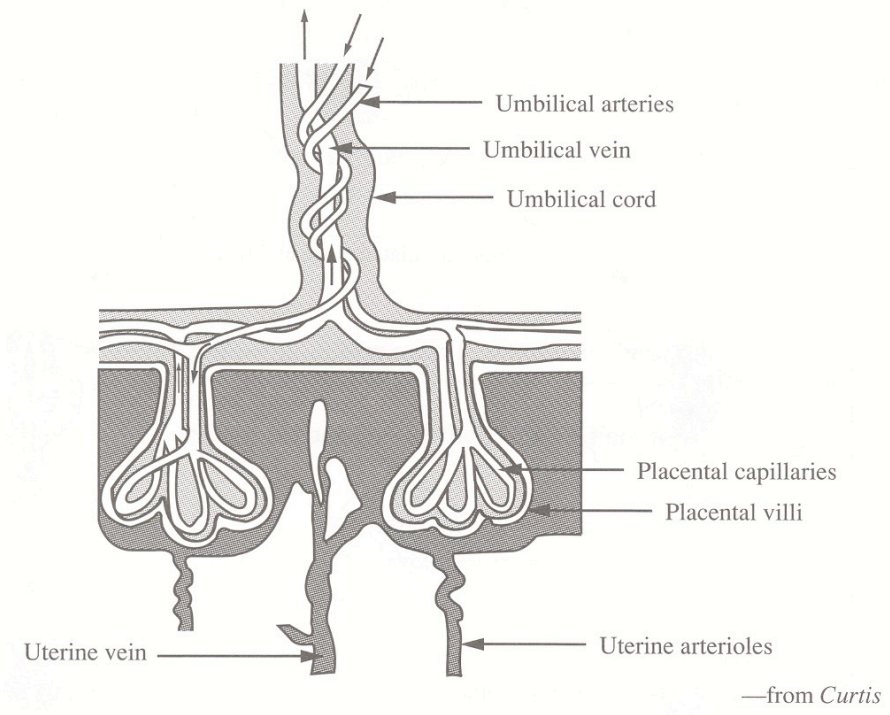
28. A graph that illustrates the cyclical variation in progesterone levels in one reproductive cycle of a non-pregnant human female is



Use the following information to answer the next question.

A Schematic View of the Placenta



29. Which of the following does **not** normally occur at the placenta?

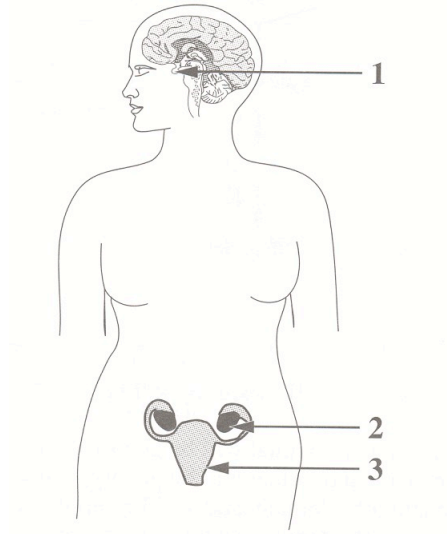
A. Nutrients move from the maternal blood to the fetal blood
B. Blood cells move from the maternal blood to the fetal blood
C. Carbon dioxide moves from the fetal blood to the maternal blood
D. Metabolic wastes move from the fetal blood to the maternal blood

30. Under normal circumstances, what **initially** determines whether an embryo develops into a male or a female? (this question is more for an upcoming unit)

A. The embryo develops testes for a male and ovaries for a female.
B. The embryo predominantly produces testosterone for a male and estrogen for a female.
C. The embryo's genital embryonic structures develop into those of a male or those of a female.
D. The embryo develops into a male if fertilization involved a Y-carrying sperm and into a female if fertilization involved an X-carrying sperm.

Use the following information to answer the next question.

Some Structures of the Human Female

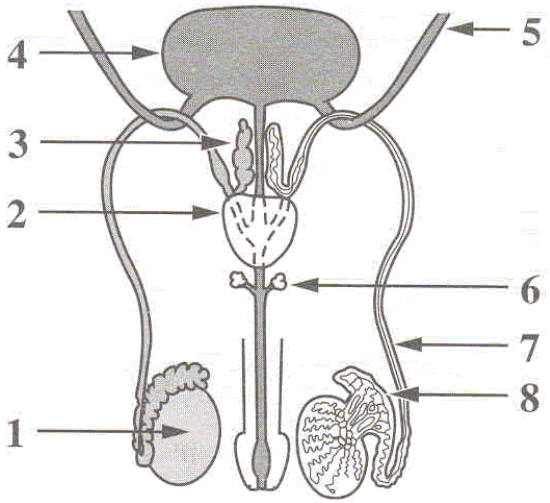


31. The gland that releases oxytocin and the target organ for oxytocin are labeled, respectively,

A. 1 and 2
B. 1 and 3
C. 2 and 1
D. 2 and 3

Use the following information to answer the next question.

The Male Reproductive System and Accessory Structures



Numerical Response

1. Identify the three structures, as numbered above, that produce the fluid secretions that make up semen.

(Record your **three-digit answer in lowest-to-highest numerical order** in the numerical-response section on the answer sheet.)

Answer: _____ _____ _____

32. In humans, the temperature within the scrotum is usually

A. above body temperature
B. below body temperature
C. the same as body temperature
D. the same as room temperature

Use the following information to answer the next question.

Functions of the Four Main Reproductive Hormones in Human Females

1 Stimulation of egg development
2 Inhibition of ovulation and uterine contractions
3 Stimulation of the development of secondary sex characteristics
4 Stimulation of ovulation and formation of the corpus luteum

Numerical Response

2 Identify the major function, as numbered above, of each of the hormones given below.

(Record your **four-digit answer** in the numerical-response section on the answer sheet.)

Function:	_____	_____	_____	_____
Hormone:	**FSH**	**LH**	**Estrogen**	**Progesterone**

Use the following information to answer the next question.

Reseachers have developed a birth control vaccine that would be given once a year. This vaccine is made from a fragment of HCG attached to a protein. The vaccine causes a woman to manufacture antibodies that bind to HCG molecules (when present) in the blood. The antibodies prevent HCG from functioning and thereby affect the implantation of a blastocyst (embryo).

33. The vaccine affects the permanent implantation of a blastocyst by indirectly causing
- **A.** disintegration of the endometrium
- **B.** increased progesterone production
- **C.** development of new follicles in the ovary
- **D.** inhibition of the movement of cilia in the Fallopian tubes

34. The onset of labour at the end of pregnancy is caused partly by a decreased level of
- **A.** LH
- **B.** FSH
- **C.** estrogen
- **D.** progesterone

Use the following information to answer the next three questions.

In vitro fertilization techniques can enable postmenopausal women (those who have gone through menopause) to have babies. Eggs are removed from a female donor and are fertilized in a culture dish. The early embryo is inserted into the uterus of the postmenopausal woman. The postmenopausal woman requires hormone supplements for implantation and development to succeed.

35. To increase the chance of successful implantation of an embryo produced by *in vitro* fertilization, the postmenopausal woman must receive
- **A.** FSH and LH to promote the development of the follicle
- **B.** FSH and LH to promote the development of the endometrium
- **C.** estrogen and progesterone to promote the development of the follicle
- **D.** estrogen and progesterone to promote the development of the endometrium

36. During the first trimester of a pregnancy, an extraembryonic membrane secretes HCG. In a pregnancy resulting from *in vitro* fertilization of a postmenopausal woman, HCG would **not** function normally because the

A. woman's pituitary would not respond
B. placenta would not produce FSH or LH
C. woman would not have a corpus luteum
D. placenta would not be permeable to hormones

37. The site of sperm production and the gland that produces an alkaline secretion that neutralizes the acidity of the vagina are given in row

Row	**Site of Sperm Production**	**Gland that Produces an Alkaline Secretion**
A	seminiferous tubules	testis
B	seminiferous tubules	prostate gland
C	seminal vesicles	testis
D	seminal vesicles	prostate gland

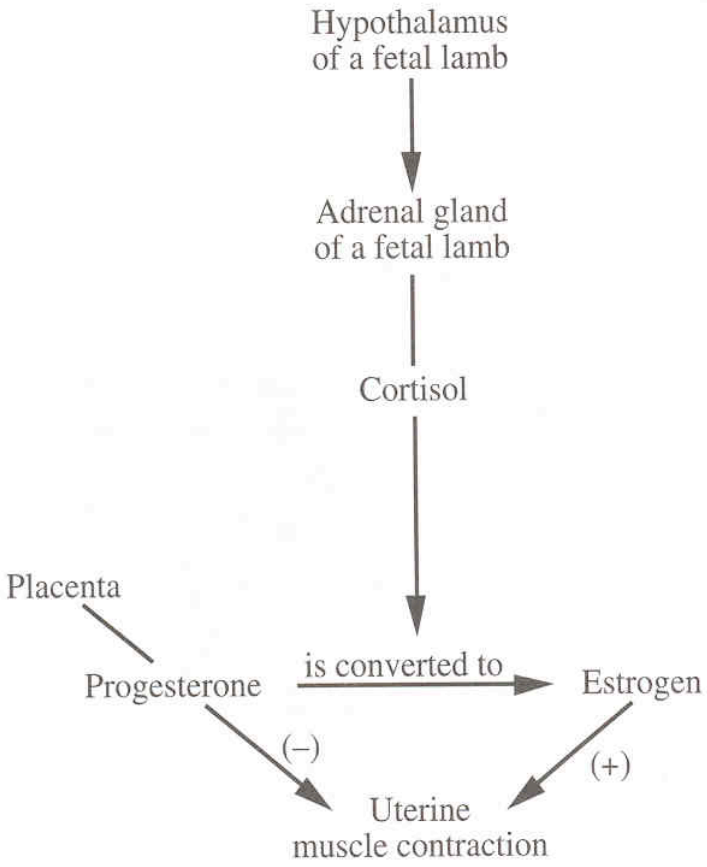
38. Another contraceptive, the birth control pill, causes negative feedback on the pituitary, which prevents the release of eggs. Typically, the hormones in the birth control pill are similar to

A. FSH and LH
B. oxytocin and prolactin
C. estrogen and progesterone
D. relaxin and gonadotropins

Use the following information to answer the next three questions.

Research on sheep might explain what stimulates pregnant mammals, including humans, to give birth. Through research on pregnant sheep, scientists have developed the following scheme to explain normal events as birth begins.

Influence of Fetal Hormones on the Maternal Reproductive System



Note: The placenta produces progesterone throughout the pregnancy, but activation of the fetal hypothalamus only occurs as birth begins.

—from *Discover, 1992*

39. According to this diagram, the birth of a lamb is linked to

A. increasing levels of estrogen in pregnant sheep
B. decreasing production of cortisol by the fetal lamb
C. increasing levels of progesterone in pregnant sheep
D. decreasing activity of the hypothalamus by the fetal lamb

40. To maintain a pregnancy for a normal gestation period, the contraction of uterine muscles is inhibited. According to the diagram, this inhibition is brought about by

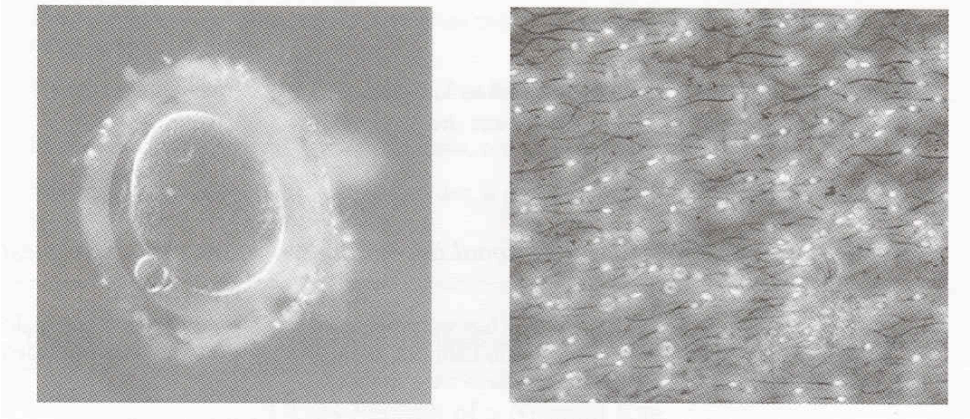
A. high levels of estrogen from the placenta
B. low levels of progesterone from the uterus
C. high levels of cortisol from the adrenal gland
D. high levels of progesterone from the placenta

41. Cryptorchidism is the failure of one or both of the testes to descend from the abdominal cavity into the scrotum during human fetal development. Sterility results if both testes fail to descend. In this case, the likely cause of sterility is that

A. lack of oxygen inhibits testosterone function
B. gonadotropic hormones cannot stimulate the testes
C. the testes are not connected to the external environment
D. normal sperm do not readily develop at body temperature

Use the following information to answer the next question.

Mature Human Oocyte Human Sperm



42. The difference in size between the human oocyte and sperm is **mostly** due to the

A. difference in magnification of the two photographs
B. distance that the sperm must travel in order to reach the oocyte
C. amount of cytoplasm present in the oocyte as compared with that in the sperm
D. number of chromosomes in the nucleus of the oocyte as compared with the number in the sperm

Use the following information to answer the next question.

A male is having fertility problems. His sperm are not making their way to the oocyte in time to fertilize it. Analysis of his seminal fluid determines two insufficiencies.

43. The two insufficiencies in semen that would affect sperms' ability to travel to the oocyte are the lack of

A. FSH and testosterone
B. fructose and testosterone
C. FSH and alkaline buffers
D. fructose and alkaline buffers

Use the following information to answer the next three questions.

Clomiphene citrate is a fertility drug used to induce ovulation in women. Clomiphene citrate, generally taken daily from day 3 to day 7 of the menstrual cycle, decreases the naturally circulating estrogen. The pituitary responds by increasing production of two gonadotropic hormones that then stimulate the ovary to ripen and release an egg. Follicle development and ovulation are usually monitored with a combination of home urine tests (on day 11 or 12) and a follow-up ultrasound examination. About 70% of women using clomiphene citrate will ovulate and 40% of those will become pregnant. The risk of multiple pregnancy (usually twins) increases by 6% to 7%.

—from Bay Area Fertility and Gynecology Medical Group

44. Without the negative feedback that results from increasing amounts of naturally circulating estrogen, the body responds by secreting more

A. FSH
B. HCG
C. prolactin
D. progesterone

45. Following clomiphene citrate treatments, patients are advised to monitor their urine for the presence of a hormone that will signal ovulation. This hormone is

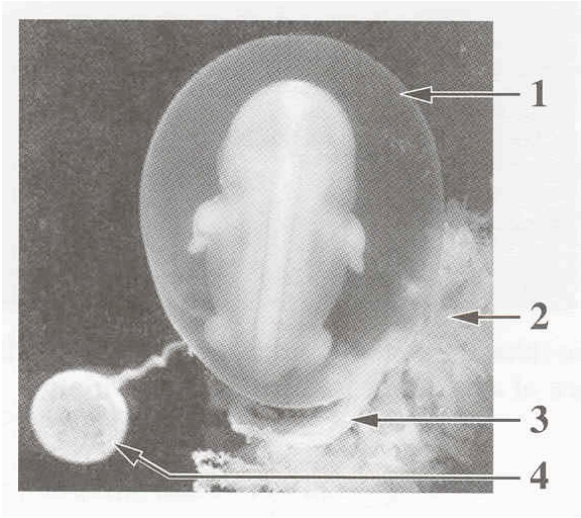
A. LH
B. FSH
C. HCG
D. estrogen

46. The incidence of multiple births increases in women who use clomiphene citrate because high levels of

A. progesterone may stimulate the release of more than one egg
B. FSH may stimulate the fertilized egg cell to divide and separate
C. FSH may stimulate the complete development of more than one follicle
D. progesterone may stimulate the fertilized egg cell to divide and separate

Use the following information to answer the next question.

Human Embryo Six Weeks After Fertilization



Descriptions of Embryonic Structures' Functions

A Transports embryonic blood
B Provides protection
C Is the site of exchange between embryonic and maternal blood
D Is used for nourishment in vertebrates other than mammals

- from *Nilsson, 1990*

Numerical Response

2. Match each embryonic structure, as numbered above, with the letter that represents its function, as listed above.

Structure: _____ _____ _____ _____
Function: **A** **B** **C** **D**

(Record your **four-digit answer** in the numerical-response section on the answer sheet.)

47. The presence of a particular hormone in urine indicates that pregnancy has occurred. This hormone is secreted by the

A. ovary
B. amnion
C. chorion
D. pituitary

Use the following information to answer the next two questions.

New research has led to advances in the development of male contraceptives. One of the most promising contraceptive methods involves injecting androgens (testosterone or other male hormones) into a male's muscles. The androgens produce a negative feedback effect on the hypothalamus and pituitary gland. In trials involving a combination of androgens, sperm counts were reduced to zero in test subjects, but this method was effective for only three weeks.

Events in a Negative Feedback Loop Controlling Sperm Production

1 Production of sperm is inhibited
2 Hormone levels in the blood return to normal
3 Production of FSH and LH is inhibited
4 High levels of the injected androgens circulate in the blood

—from *Alexander. 1999*

Numerical Response

3. The order in which the events listed above would occur following the injection of androgens into a male's muscle is _____, _____, _____, and _____.

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Use the following additional information to answer the next question.

Researchers developing male contraceptives have found other methods of interfering with various stages of sperm development and sperm release from the body. Some methods of contraception currently being investigated are given below.

1 Interfering with the process of meiosis by which sperm are produced
2 Blocking the release of hormones that stimulate the release of FSH and LH
3 Using removable polyurethane plugs to block the tubes that transport sperm
4 Administering a calcium-blocking drug that interferes with the final maturation of sperm

Numerical Response

4. Match each of the methods of contraception described above with the structure given below that is targeted by that method.

Method of Contraception:	_____	_____	_____	_____
Structure:	**Seminiferous tubules**	**Epididymis**	**Vas deferens**	**Hypothalamus**

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)