

Review questions for Reproductive system lecture

Multiple choice review questions:

- 3) In males, the pituitary hormone LH...
 - A) causes the fallopian ducts to develop
 - B) causes testosterone production
 - C) causes sperm production
 - D) causes erection

- 4) In boys, testosterone by itself causes all of the following *except*
 - A) deeper voice
 - B) increased muscle mass
 - C) increased sex drive
 - D) sperm production

- 5) In the testis FSH is only able to directly stimulate
 - A) muscle growth
 - B) testosterone production
 - C) sperm production
 - D) None of the above choices is correct; FSH only has effects in the ovary.

- 6) An ovarian follicle that has released its egg turns into...
 - A) a primordial follicle.
 - B) an endometrium
 - C) a secondary follicle.
 - D) a corpus luteum

- 7) The corpus luteum is sustained by
 - A) estrogen
 - B) FSH
 - C) LH
 - D) testosterone

- 8) Progesterone levels are highest during the ____ phase of the reproductive cycle.
 - A) follicular (follicle is maturing)
 - B) proliferative (endometrium is thickening)
 - C) menstrual (menstruation is occurring)
 - D) luteal (corpus luteum is mature)

- 9) Ovulation is caused by
- A) a surge of pituitary LH and FSH
 - B) a follicle growing large enough to secrete large amounts of LH.
 - C) sexual arousal.
 - D) rising levels of progesterone.
- 10) Sloughing off of the endometrium is known as...
- A) menopause.
 - B) menarche.
 - C) menstruation.
 - D) amenorrhea.
- 11) Milk letdown (ejection of milk from the breast) is a neuroendocrine reflex arc that requires which hormone?
- A) luteinizing hormone
 - B) prolactin
 - C) oxytocin
 - D) dopamine
- 12) A zygote undergoes its first division or cleavage and becomes a two-celled embryo
- A) inside the ovary
 - B) in the fallopian tube
 - C) when it arrives in the uterus about four days after ovulation.
 - D) when it becomes implanted in the uterine wall about six days after fertilization.
- 13) The ball-shaped embryo that implants in the uterine wall is the
- A) trophoblast.
 - B) morula.
 - C) frondosum.
 - D) blastocyst.
- 14) To prevent menstruation and to sustain pregnancy, the trophoblast cells of the implanted embryo must secrete ____ for the first five or six weeks.
- A) progesterone
 - B) human chorionic gonadotropin
 - C) luteinizing hormone
 - D) estrogen
- 15) Labor is caused by the hormone
- A) LH
 - B) Oxytocin
 - C) Progesterone
 - D) hCG

Answers to multiple choice review questions

3 = B

4 = D

5 = C

6 = D

7 = C

8 = D

9 = A

10 = C

11 = C

12 = B

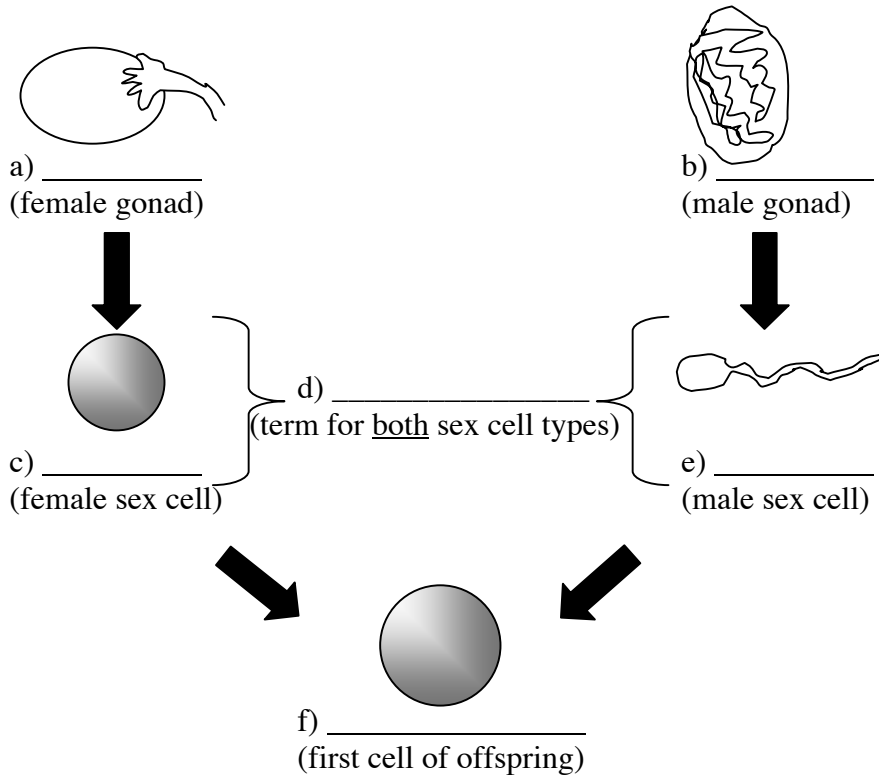
13 = D

14 = B

15 = B

Fill-in-the-blank review questions

1) Fill in the following blanks using the hints below:



- 2) The gametes produced by the female are called the eggs or the _____; They are produced and stored in the female gonads, the _____.
- 3) Within the testes, sperm production occurs in tubes called the _____.
- 15) The penis of the male contains _____ tissue, which fills with blood when an erection occurs.
- 16) FSH stimulates the testes to make _____.
- 17) LH stimulates the testes to make _____.
- 18) FSH and LH are made by the _____ gland.
- 19) The major hormone produced by the testes is _____.
- 20) In the male, _____ initiates maturation of male reproductive organs, causes appearance of secondary sexual characteristics and sex drive, maintains sex organs in their functional state, and (in combination with FSH) is necessary for sperm production.

- 21) Each immature ova and the surrounding cells that protect and support it, is called a(n) _____. In the adult female, hundreds of thousands of these are inside each _____ (an organ).
- 22) The ova which was released during ovulation is swept by the finger-like _____ away from the ovary and into the _____ tube.
- 23) Some ova are lost; The fimbriae are not able to guide them into the fallopian tube. They instead enter into the _____ body cavity where they degenerate in a few days.
- 24) The thick muscular layer of the uterus is called the _____; it is made of _____ type of muscle tissue.
- 25) The innermost layer of the uterus is the _____, it grows thicker in preparation for pregnancy, and then sloughs off if no pregnancy occurs.
- 26) The endometrium is mostly made of _____ (one of the four major tissue types). It contains large numbers of _____ to supply the embryo with nutrients should pregnancy occur.
- 27) The opening of the vagina to the outside of the body is flanked on either side by thin folds of sensitive skin called the _____. These meet superiorly to form a hood-like covering for the _____, which is the center for much of a female's sexual sensation.
- 28) The _____ contains erectile spongy tissue (as does the penis in the male). Although much smaller than the penis, it also becomes erect during sexual arousal.
- 29) The two major hormone products of the ovaries are _____ and _____.
- 31) After puberty and through middle age, cyclic hormonal changes control the roughly _____ day _____ cycle. (The exact number of days varies.)
- 32) Because it is easy to identify without ambiguity, the first day of the female reproductive cycle is the day on which the _____ begins to be shed, emerging from the vagina together with blood in a process called _____.
- 33) A follicle begins enlarging and maturing during the ovarian cycle starting at day _____. Ovulation occurs on day _____.
- 34) The release of the ova from the follicle is called _____.
- 35) On very rare occasions, two follicles mature and rupture together. Conception and birth resulting from these events gives rise to _____.
- 36) The cells of the follicle which remain behind, in the ovary (after ovulation) increase in size and form a small yellow endocrine gland called the _____. This small gland within the ovary secretes _____ (and a relatively small amount of _____) throughout the second half of the uterine cycle.

37) If fertilization does not occur, the _____ will degenerate by the end of the ovarian cycle (day _____) and stop making hormones.

38) During the first few days of the ovarian cycle, a follicle within the ovary begins to mature, and as it does it secretes _____. As the follicle gets larger, the level of this hormone rises, and the endometrium of the uterus responds by _____.

39) The reproductive cycle is controlled hormonally. The maturation of the follicles in the ovaries is triggered by _____, which is released by the _____ gland.

40) After ovulation, the corpus luteum is sustained by _____ hormone.

41) The _____ phase of the uterine cycle occurs when the ovary is in its luteal phase (contains a corpus luteum).

42) Approximately the first _____ days of the uterine cycle constitute the _____ phase, during which the surface of the endometrium is shed and discarded via the vagina.

43) At the same time that the follicle is maturing, the uterus is preparing itself for _____ by thickening the _____.

44) The phase of the uterine cycle during which the endometrium of the uterus is growing thicker is the _____ phase. It begins around day _____. The phase of the uterine cycle during which the endometrium develops glands that secrete sticky substances is called the _____ phase. It begins around day _____. If no pregnancy occurs, the endometrium will last until day _____ of the reproductive cycle, after which it sloughs off and becomes the menstrual flow.

45) If pregnancy does not occur, the corpus luteum degrades and so progesterone levels fall. Without progesterone, the _____ will detach from the uterus.

46) If fertilization has not occurred, the egg and the detached endometrium will eventually pass down through the narrow lower part of the uterus, a region which is called the _____, and from there the menstrual flow passes through the _____, and finally out of the body.

47) Ovulation marks a dramatic change in the events which are occurring in the uterus. The days just prior to ovulation are the _____ phase (named after the thickening of the _____ lining of the uterus), and the days just following ovulation are the _____ phase of the uterine cycle.

48) The hormones _____ and _____ are produced during and after puberty in the pituitary gland: they regulate the function of the ovaries and testes, and control egg and sperm production.

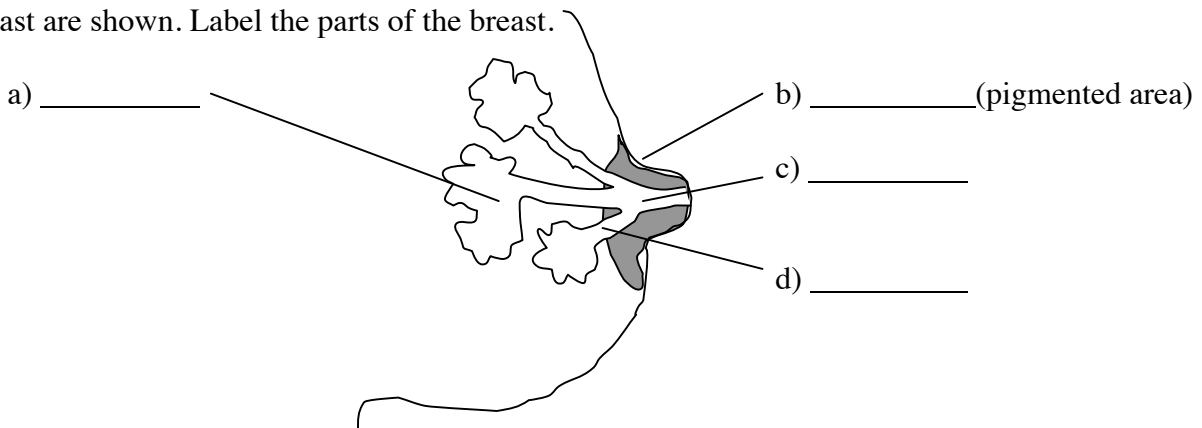
49) Below are several descriptions of events that occur in the female ovarian and uterine cycles. After each description, write “1-5” if it happens on days 1 – 5 of the cycle, write “6-13” if it happens on those days of the cycle, write “14” if it happens on day 14, and write “15-28” if it happens on those days of the cycle. Some blanks may require more than one answer.

- a) The corpus luteum is present: _____
- b) Ovulation occurs: _____
- c) Menstruation occurs: _____
- d) The endometrium is growing thicker: _____
- e) LH and FSH levels are decreasing: _____
- f) There is a sudden sharp increase in LH and FSH levels: _____
- g) A follicle is growing larger: _____
- h) Progesterone is being released from the corpus luteum: _____
- i) Estrogen is being released from the corpus luteum: _____

50) You are an egg (yes, you are). You start off as an unfertilized egg and then you become fertilized by a sperm cell. Indicate the order of the events that happen to you by writing 1 after the first event, 2 after the second event, etc.

- You are in the lower part of the fallopian tube _____
- You are fertilized _____
- You are in the uterus _____
- You are pulled by a fimbriae _____
- You are in a mature follicle _____
- Ovulation occurs _____
- You are pushed by cilia _____

52) The drawing below shows a side view of the breast, including some of the ducts and glands inside the breast are shown. Label the parts of the breast.



53) Each breast consists of 15-25 cone shaped _____ that produce milk. Milk that is produced in each is secreted first through a _____ and then through _____ ducts which open on the nipple's surface.

54) The milk is drawn from the breast by suction as a baby nurses. Each nipple is surrounded by a circular band (pigmented in some individuals) called the _____.

- 55) Prolactin, as its name suggests, is the hormone that promotes _____.
- 56) Prolactin production by the _____ gland begins before the baby's birth, but milk production is small until after birth.
- 57) The baby's suckling stimulates the nipples to send signals to the hypothalamus, which responds by causing the pituitary to release the hormones _____ and _____.
- 58) Oxytocin causes the _____ tissue of the mammary glands to contract, resulting in _____ by both breasts. This reflex is called the _____ reflex.
- 59) The breasts contain much _____ tissue, which provides fat to the milk.
- 60) The oral contraceptives usually consist of synthetic _____ hormone. The purpose of this hormone is to prevent _____ so that fertilization cannot occur.
- 62) In the female reproductive tract, ejaculated sperm can survive up to a period of about _____ days.
- 63) The fusion of a sperm cell and an ovum (egg cell) is a process known as _____.
- 64) When an ovum fuses together with sperm, a single cell results. This cell is called a(n) _____ or a "fertilized egg". It divides many times on its way to the uterus.
- 65) In order to be fertilized, the ova must encounter a sperm within _____ hours of ovulation. (Sperm can live in the female reproductive tract for up to _____ days). These facts together mean that a woman is usually fertile on day _____ through day _____ of her reproductive cycle.
- 66) Fertilization usually occurs in this region of the fallopian tube (select the correct answer):
- a) The end nearest the ovary
 - b) The middle
 - c) The end nearest the uterus
- 67) You are a sperm cell (yes, you are). Name all tubes or hollow organs that you will pass through to meet the egg, starting with the tubes where you are first formed and ending with the tube where you meet the egg. List all tubes/hollow organs in the order you will pass through them.
- 69) From the fallopian tube, the egg - whether it has been fertilized or not - arrives at the _____ region of the uterus first, which is the uppermost region of the uterus.
- 70) Almost immediately after fertilization, the zygote begins to _____.
- 71) The term _____ means the ball-shaped embryo that becomes implanted in the endometrial wall of the uterus.

- 72) The blastocyst is a hollow ball. The outer wall is the _____ cells, and the cluster of cells inside is the _____. The outer cells will eventually develop into the _____, while the inner cells will eventually form the _____.
- 73) To prevent menstruation, the cells of the blastocyst release _____ hormone. This hormone is very similar in structure to the pituitary hormone _____. In fact, the blastocyst hormone replaces the declining levels of the pituitary hormone that the corpus luteum needs for survival. Using the hormone from the blastocyst, the corpus luteum survives and continues to make _____ hormone, which prevents menstruation.
- 74) The _____ cord connects the developing embryo to the placenta until birth.
- 75) The _____ is a fluid-filled sac which surrounds the fetus. It provides cushioning and support during development.
- 76) A rudimentary circulatory system and a beating heart are present by the start of week _____ (which week?) after fertilization.
- 77) Organogenesis is the formation of organs and organ systems; by the end of week _____ (which week?), foundations of all organ systems are recognizable.
- 78) From the beginning of week _____ (which week?) after conception, the developing child is no longer an embryo, but is instead called a(n) _____.
- 79) During pregnancy, the uterus enlarges dramatically _____ (in which direction?). This sometimes causes _____ by compressing the _____ (a digestive organ).
- 80) Near the end of pregnancy, placental production of the hormone relaxin causes the _____ of the pelvis to soften and relax. A possible side-effect is that the woman may become more limber.
- 81) Blood volume increases for the needs of the fetus, leading to increases in the mother's _____.
- 82) _____ means childbirth, and usually occurs around week _____ after fertilization.
- 83) _____ hormone causes the uterine contractions during labor. This same hormone also causes ejection of milk in response to a baby's suckling. It is released from the _____ gland.
- 84) Pressure of the baby's head against the _____ signals the pituitary to release oxytocin, which causes a uterine contraction. The contraction of the uterus pushes the baby's head against the _____ again, which causes more hormone release and another contraction. This cycle continues until the baby is expelled.
- 85) Labor is divided into three stages: the _____, _____ and _____ stages.
- 86) The dilation stage of labor extends from onset of contractions to the time when the _____ is fully dilated.

- 87) At some time during the dilation stage, the amniotic sac will _____ (or a medical care worker will see that it happens when dilation is nearly complete, if necessary). This is known as the _____.
- 89) The expulsion stage extends from the moment of _____ until the time the infant is delivered. As this stage approaches, the mother's urge to assist the labor process by _____ becomes intense. (This urge varies depending on which method is chosen for pain reduction.)
- 90) Surgical deliveries (known as _____) are sometimes needed if the expulsion stage will be difficult.
- 91) The expulsion stage of labor is typically _____ in length for a woman's first baby, but on subsequent births it can be as short as _____.
- 92) The third and final stage of labor is the _____ stage, in which the placenta and attached fetal membranes, no longer needed, are expelled.
- 94) After each description below, write D if it describes Dilation stage of labor, write E if it describes Expulsion stage of labor, and write P if it describes Placental stage of labor. Some blanks may require more than one answer.
- The amniotic sack is expelled: _____
 - The woman's uterus is contracting: _____
 - The longest of the 3 stages of labor: _____
 - The amniotic fluid leaks out of the vagina: _____
 - The cervix is fully dilated throughout this stage: _____
 - Doctors may perform a "C-section" to skip this stage if this stage is considered too risky for the mother or the baby: _____

Answers to fill-in-the-blank review questions:

- | | |
|-------------------------|---------------------|
| 1) a) Ovary | Fallopian |
| b) Teste | 23) Abdominal |
| c) Egg/Ova | 24) Myometrium |
| d) Gametes | Smooth |
| e) Sperm | 25) Endometrium |
| f) Zygote | 26) Epithelial |
| 2) Ova | Blood vessels |
| Ovary | 27) Labia |
| 3) Seminiferous tubules | Clitoris |
| 15) Spongy | 28) Clitoris |
| 16) Sperm | 29) Estrogen |
| 17) Testosterone | Progesterone |
| 18) Pituitary | 31) 28 |
| 19) Testosterone | Female reproductive |
| 20) Testosterone | 32) Endometrium |
| 21) Follicle | Menstruation |
| Ovary | 33) 1 |
| 22) Fimbriae | 14 |

- 34) Ovulation 4
- 35) Fraternal twins
- 36) Corpus luteum
Progesterone
Estrogen
- 37) Corpus luteum
28
- 38) Estrogen
Thickening
- 39) FSH
Pituitary
- 40) LH
- 41) Secretory
- 42) 5
Menstrual
- 43) Implantation of the embryo
Endometrium
- 44) Proliferative
6
Secretory
15
28
- 45) Endometrium
- 46) Cervix
Vagina
- 47) Proliferative
Endometrial
Secretory
- 48) FSH
LH
- 49) a) 15-28
b) 14
c) 1-5
d) 6-13
e) 15-28
f) 14
g) 1-5, 6-13
h) 15-28
i) 15-28
- 50) 6
5
7
3
1
2
- 52) a) Mammary (milk-producing) glands
Mammary duct
Lactiferous duct
Areola
- 53) Mammary glands
Mammary duct
Lactiferous ducts
- 54) Areola
- 55) Milk production
- 56) Pituitary
- 57) Prolactin
Oxytocin
- 58) Smooth muscle
Milk ejection
Let down
- 59) Adipose
- 60) Progesterone
Ovulation
- 62) Three
- 63) Fertilization
- 64) Zygote
- 65) 24
3
11
14
- 66) A (the end nearest the ovary)
- 67) Seminiferous tubules
Epididymis
Vas Deferens
Urethra
Vagina
Uterus
Fallopian tube
- 69) Fundus
- 70) Divide
- 71) Blastocyst
- 72) Trophoblast
Inner cell mass
Placenta
Baby
- 73) hCG
LH
Progesterone
- 74) Umbilical
- 75) Amnion

76) Four	Placental
77) Eight	86) Cervix
78) Nine	87) Break/tear
Fetus	Water breaking
79) Upward	89) Full dilation of the cervix
Acid reflux (heart burn)	Pushing with her abdominal muscles
80) Ligaments	90) Caesarian sections
81) Blood pressure	91) One hour
82) Parturition/Partum	20 minutes
37	92) Placental
83) Oxytocin	94) a) P
Pituitary	b) D
84) Cervix	c) D
Cervix	d) D
85) Dilation	e) E
Expulsion	f) E

Short answer review questions:

- 5) Describe briefly the changes in the penis tissues that produce an erection.
- 6) A young boy is in an car accident. His pituitary gland is damaged but his testes are undamaged. Years later, when the boy reaches puberty, he does not show any of the usual signs of male puberty (beard, mustache, lowered voice). Explain his lack of male characteristics in terms of hormones.
- 7) List the hormone secretions of the follicle and the corpus luteum in females. Your list should also note what family of hormones are being secreted.
- 8) Ectopic pregnancies are pregnancies where the embryo implants and begins to grow in a region of the woman's body other than her uterus. This endangers the life of the mother and therefore ectopic pregnancies are usually terminated. Although the cause of ectopic pregnancies is not understood, explain how (in theory) malfunctioning cilia or malfunctioning fimbriae could cause an ectopic pregnancy. In each case, explain where the embryo would implant and grow.
- 9) Most hormone-based contraceptives (such as birth control pills) contain large amounts of what hormones? _____ Explain why large amounts of these hormones prevent pregnancy.
- 10) Explain the role of hCG in sustaining pregnancy. Your answer should include a) The source of hCG, b) its target organ, c) What activity it promotes in the target organ, and d) why this target-organ activity is important in sustaining pregnancy.
- 11) Explain the role of relaxin hormone in pregnancy. Your answer should include a) The source of relaxin, b) its target organs, c) What activity it promotes in the target organ, and d) why this target-organ activity is important in pregnancy.

12) Many pregnant women report changes in their bodies as they get near their due date. After each change described below, explain what causes the change.

- a) Frequent urination
- b) Upset stomach or heartburn.
- c) Getting more limber (they can bend their arm and leg joints in extreme ways that would have been painful before pregnancy).

13) To induce labor, doctors sometimes give a woman an artificial version of a pituitary hormone. Name the labor-inducing hormone: _____. The artificial hormone that is injected only causes a few contractions (not enough contractions to expel the baby). But those few contractions are enough to put the woman’s body into labor, where it generates its own contractions until the baby is born. Explain how inducing a few contractions can start a cycle of hundreds contractions that lead to the birth of the baby.

14) Items a – d below describe situations where something goes wrong in the reproductive process. After each item, answer Yes or No about whether fertilization would occur? Would implantation occur? Would the baby reach term (full development)? Would the birth be a normal birth? Under any “No” answers, explain what exactly would go wrong in the pregnancy.

	<u>Fertilization?</u>	<u>Implantation?</u>	<u>Reach term?</u>	<u>Normal birth?</u>
a) The cilia in the fallopian tube don’t function.	_____	_____	_____	_____
b) The myometrium does not function.	_____	_____	_____	_____
c) hCG is not produced.	_____	_____	_____	_____
d) The inner cell mass is missing from the blastocyst.	_____	_____	_____	_____

Problem 15) If a nursing mother’s pituitary gland were able to make the hormone prolactin but not the hormone oxytocin, would her baby be able to nurse effectively? Why or why not?

Answers to short-answer review questions:

5) The penis contains “spongy tissue”, which is tissue containing many unfilled open spaces between the cells. When a man becomes sexually aroused, blood enters the spongy tissue of the penis and fills the

empty spaces between the cells. The blood pressure and blood volume in the spongy tissue increase the length and rigidity of the penis, resulting in an erection.

6) The normal changes that occur to a male during puberty include deepening of the voice and growth of facial hair. These (and many other) male characteristics are caused by testosterone, a hormone produced by the testes. If these male traits do not develop at puberty, the problem may be a defect in the testes' ability to make testosterone. The testes, however, require the pituitary hormone LH to make testosterone. If the testes are undamaged, yet the male does not display any of the normal male characteristics, the problem may be damage to the pituitary that results in insufficient LH production.

7) Follicles make primarily estrogen. The corpus luteum makes progesterone and a little estrogen. All of these hormones are in the steroid family of hormones.

8) The cilia propel the embryo through the fallopian tube to the uterus. If the cilia were not functioning an ectopic pregnancy would occur within the fallopian tube. The fimbriae draw the ova from the ovary into the fallopian tube. If the fimbriae were not functioning, the ova would not enter the fallopian tube but instead would implant somewhere within the abdominopelvic cavity (such as on the outside of the intestines).

9) Most hormone-based contraceptives contain large amounts of the hormones estrogen and progesterone. High levels of progesterone and estrogen occur naturally in the body during pregnancy. The high levels of these hormones from the contraceptive "fool the body into thinking it is pregnant." To be more precise, the high levels of estrogen and progesterone halt ovulation (because it would be wasteful for the ovaries to release eggs during pregnancy). By preventing ovulation, the contraceptive prevents pregnancy.

10) The hormone hCG (human chorionic gonadotropin) is released by the embryo starting just a few days after fertilization has occurred. The target organ of the hormone is the corpus luteum in the ovary. The hCG sustains the corpus luteum (in other words, the hCG keeps the corpus luteum alive and functioning). This is very important for maintaining the pregnancy because the corpus luteum makes the progesterone that prevents menstruation during pregnancy. If the embryo did not make hCG, the corpus luteum would die about two weeks after ovulation. The decrease in progesterone would cause the woman to menstruate, which would end the pregnancy.

11) The hormone relaxin is made by the placenta near the end of pregnancy. Its target organs are the ligaments, especially the ligaments of the pelvis. Relaxin causes the ligaments to loosen. This loosening is important because it allows the mother's pelvic bones to open apart more widely than usual, which facilitates the birthing process.

12) Frequent urination during the latter parts of pregnancy is caused by the fetus compressing the bladder. Also, the increased blood volume and metabolic activity of the mother leads to larger-than-usual volumes of urine being produced. Upset stomach/heartburn is caused by the fetus compressing the digestive system organs, especially the stomach in the case of heartburn (acid reflex). Getting more limber during pregnancy (an effect that does not happen to all pregnant women) is due to the placental hormone relaxin loosening the ligaments of the body in preparation for labor.

13) The hormone oxytocin causes labor contractions. (The synthetic version of the hormone given to induce labor is called pitocin). The first contractions of labor push the baby's head against the cervix. This triggers a reflex that causes the mother's pituitary gland to release oxytocin, which then causes more contractions, which presses the baby's head against the cervix again, which causes more oxytocin to be released, etc. This cycle repeats itself until the baby is delivered. If the mother is having trouble stating contractions, an injection of the hormone is given. The injected hormone causes only a few contractions of the uterus, but those few lead to the cycle of contractions described above.

14)	<u>Fertilization?</u>	<u>Implantation?</u>	<u>Reach term?</u>	<u>Normal birth?</u>
a) The cilia in the fallopian tube don't function.	Yes	No	No*	N/A
b) The myometrium does not function.	Yes	Yes	Yes	No**
c) hCG is not produced.	Yes	Yes	No***	N/A
d) The inner cell mass is missing from the blastocyst.	Yes	Yes	No****	N/A

* The embryo would start to develop inside the fallopian tube. This is an ectopic pregnancy. Because this is a threat to the mother's life, ectopic pregnancies are usually terminated.

** The myometrium is the uterine muscle that expels the baby during labor. If it were not functioning, a caesarean section (surgical delivery) would be performed.

*** hCG is needed to prevent menstruation during pregnancy. If no hCG is made the developing embryo would be lost in the next menstruation.

**** The inner cell mass is the part of the embryo that develops into the baby. If it were missing, no baby would develop.

15) The baby would not be able to nurse as effectively as normal. The prolactin hormone causes the glands within the breast to make milk but the oxytocin hormone is needed for the glands to eject the milk to the nipple.