KWAME NKRUMAH UNIVERSITY OF SCIENCE TECHNOLOGY, KUMASI.

COLLEGE OF SCIENCE

DEPARTMENT OF THEORETICAL AND APPLIED BIOLOGY

B.Sc. (Theoretical & Applied Biology) First Semester Examination, 2017

Fourth Year

BIOL 459 HUMAN REPRODUCTIVE AND NEUROENDOCRINE FUNCTIONS

DECEMBER, 2017 TIME: TWO HOURS.

Your Index Number

Read the Instructions Carefully:

(i) Write your index number CLEARLY at the top right of this page in the spaces provided.

(ii) *Answer **ALL** questions.*

(iii) *Select the best answer, circle the answer on the question paper and shade the letter of the correct answer on the scannable sheet provided.*

(iv) **Under no condition should this question paper or any part of it be taken out from the examination hall.**

You are **NOT** to start work or turn to the next page until you are told to do so.

1. The folds of the cerebrum increase its surface area. This is important in the brain's performance because it
   (A) maximizes the number of cell bodies that process information.
   (B) prevents a "short circuit" between adjacent areas.
   (C) allows the cerebrum to absorb more oxygen.
   (D) increases myelin, which speeds up nerve signals.
   (E) more effectively protects the cerebrum from damage.

2. Given the following structures:
   I. Cervical canal
   II. Peritoneal cavity
   III. Uterine cavity
   IV. Uterine tube

   Assume a couple has just consummated the sex act and the sperm cells of the male been deposited in the vagina. Trace the pathway of the sperm cells through the female's reproductive tract to the ovary.
   (A) 1, 3, 4, 2
   (B) 1, 3, 2, 4
   (C) 3, 1, 2, 4
   (D) 3, 1, 4, 2
   (E) 4, 2, 1, 3

3. The corpus luteum eventually deteriorates during pregnancy. After this occurs, a primary follicle is usually still not able to develop. Why?
   (A) The levels of oestrogen are too low during pregnancy to stimulate the development of a primary follicle.
   (B) The hormonal functions of corpus luteum are assumed by the placenta.
   (C) Unlike the corpus luteum, the placenta does not produce FSH. This reduces the likelihood that a primary follicle will develop.
   (D) Low concentrations of oestrogen and progesterone during pregnancy inhibit the production and release of FSH.
   (E) The absence of HCG reduces the likelihood that a primary follicle will develop.

4. The ovaries are responsible for
   (A) the production of female gametes.
   (B) the secretion of female sex hormones.
   (C) the secretion of inhibin.
   (D) A and B are correct.
   (E) A, B, and C are correct.

5. The major nerve of the cervical plexus that innervates the diaphragm is the
   (A) median nerve.
   (B) axillary nerve.
   (C) phrenic nerve.
   (D) fibular nerve.
   (E) musculocutaneous nerve.

6. Human seminal plasma, the fluid part of semen, is produced by contributions from the:

I. Urethra
II. Prostate
III. Seminal vesicle
IV. Bulbourethral gland

(A) I and III
(B) I and IV
(C) III and IV
(D) I, III and IV
(E) II, III andIV

7. Which paired cranial nerve is being tested as you visually follow a physician's finger that is brought close to your nose, causing you to become cross-eyed?

(A) Abducens.
(B) Oculomotor.
(C) Trochlear.
(D) Optic.
(E) Olfactory

8. Which of the following statements is **false**?

(A) In the spinal cord, the white matter contains the axons conducting information up and down the spinal cord.
(B) The limbic system is involved in basic physiological derives, instincts and emotions.
(C) The limbic system consists of primitive forebrain structures.
(D) The vast majority of the nerve cell bodies in the human nervous system are contained within the limbic system.
(E) In humans, a part of the limbic system is necessary for the transfer of short-term memory to long-term memory.

9. What happens during fertilisation in humans after many sperms reach close to the ovum?

(A) Cells of corona radiata trap all the sperms except one.
(B) Only two sperms nearest the ovum penetrate zona pellucida.
(C) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida
(D) All sperms except the one nearest to the ovum lose their tails.
(E) Secretions of acrosome helps two sperms nearest the ovum penetrate zona pellucida

10. The oldest parts of the vertebrate brain provide----------
(A) reflex control of breathing, blood circulation, and other basic activities.
(B) coordinating and relaying visual and auditory information.
(C) storing, comparing, and using experience to initiate novel, non-stereotyped action.
(D) both A and B.
(E) both A and C.

11. Developing spermatozoa are nourished by the
(A) interstitial cells.
(B) seminal vesicles.
(C) sustentacular cells.
(D) Leydig cells.
(E) epididymis.

12. Hormones and their functions are listed in the table below. Match the columns and select the correct option.

Column I	**Column II**
(a) Oxytocin	**(p)** Stimulates ovulation
(b) Prolactin	**(q)** Implantation and maintenance of pregnancy
(c) Luteinizing hormone	**(r)** Lactation after child birth
	(t) Reabsorption of water by Nephrons
(d) Progesterone	**(s)** Uterine contraction during labour

(A) **(**a) - (s), (b) - (r), (c) - (p), (d) - (q)
(B) (a) - (t), (b) - (p), (c) - (s), (d) - (r)
(C) (a) - (s), (b) - (q), (c) - (r), (d) - (t)
(D) (a) - (t), (b) - (r), (c) - (p), (d) - (s)
(E) (a) - (s), (b) – (r), (c) - (p), (d) - (s)

13. About which day in a normal human menstrual cycle does rapid secretion of LH (Popularly called LH-surge) normally occurs?
(A) 5^{th} day
(B) 11^{th} day
(C) 14^{th} day
(D) 20^{th} day
(E) 30^{th} day

14. The genitofemoral, femoral, and lateral femoral cutaneous nerves are major nerves of the
(A) lumber plexus.
(B) sacral plexus.
(C) brachial plexus.
(D) cervical plexus.
(E) thoracic plexus.

15. Which of the following statements is **false** concerning the gray mater of the spinal cord?
(A) The gray mater is located in the interior of the spinal around the central canal.
(B) The gray mater functions in processing neural information.
(C) The gray mater is divided into regions called horns.
(D) The gray mater contains motor neurons.
E) The gray mater is primarily involved in relaying information to the brain.

16. The part of Fallopian tube closest to the ovary is
(A) Ampulla.
(B) Cervix.
(C) Fundus.
(D) Isthmus.
(E) Infundibulum.

17. The rate of the human heart beat is controlled by which of the following? (Pick the most complete and specific answer)
(A) Sympathetic nervous system.
(B) Parasympathetic nervous system.
(C) Somatic nervous system.
(D) Autonomic nervous system.
(E) Peripheral nervous system.

18. Which is the most likely consequence of sperm **not** remaining in the epididymis until they reach maturity?
(A) They will be diploid.
(B) They will not have complete mitosis.
(C) They will not be motile.
(D) They will not contain enough fructose to successfully "swim" to the egg.
(E) They will not produce enough buffered solution to protect themselves from the acidity of the vagina.

19. In human adult males, the testes produce sperm at an average of
(A) 300,000 per a day.
(B) 3,000,000 per day.
(C) 30,000,000 per week.
(D) 30,000,000 per day.
(E) 300,000,000 per day.

20. Which describes spermatogoia?
(A) Diploid primary spermatocytes.
(B) Germ cells that have not begun meiosis.
(C) Spermatocytes after the first meiotic division.
(D) Spermatocytes after the second meiotic division.
(E) Mature sperm.

21. The following are the steps involved in a reflex arc.
1. activation of a sensory neuron
2. activation of a motor neuron
3. response by an effector
4. arrival of a stimulus and activation of a receptor
5. information processing

The proper sequence of these steps is

(A) 1, 3, 4, 5, 2
(B) 4, 5, 3, 1, 2
(C) 4, 3, 1, 5, 2
(D) 4, 1, 5, 2, 3
(E) 3, 1 ,4, 5, 2

22. All humans produce identical gonadotrophic hormones that elicit different responses, depending on whether the individual is male or female. This shows that the type of response is controlled by

(A) the nature of the target cell.
(B) the secreted hormone.
(C) the anterior pituitary
(D) the hypothalamus.
(E) the gonads.

23. If an adult male jumped into a swimming pool of cold water, which of the following would be expected to happen?

(A) The testes descend away from the body.
(B) The dartus muscles relax.
(C) The skin of the scrotum becomes loose and thin.
(D) The cremaster muscles contract.
(E) The testes ascend towards the body.

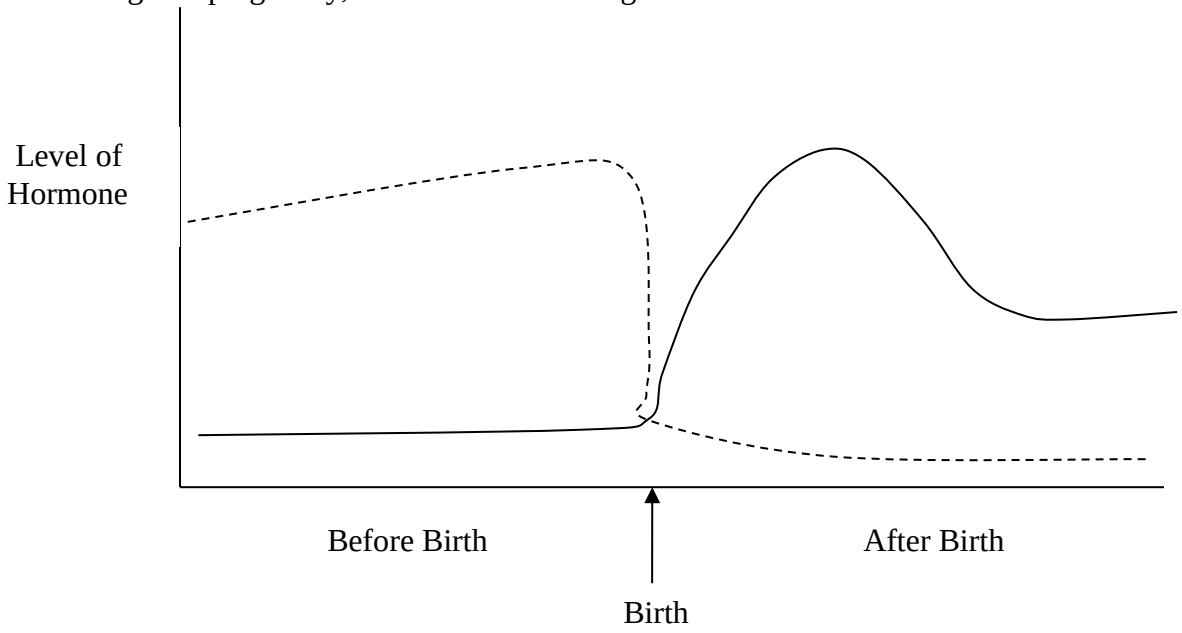
24. The most highly developed part of the human brain (the forebrain) includes the ----------

(A) medulla oblongata, pons, and cerebelum.
(B) cerebrum, thalamus, hypothalamus, and limbic system.
(C) medulla oblongata, pons, and cerebral cortex.
(D) cerebellum, medulla oblongata, pons, and limbic system.
(E) hypothalamus, limbic system, pons, and cerebral cortex.

25. A cerebrovascular accident occurs when

(A) the reticular activating system fails to function.
(B) the prefrontal lobe is damaged.
(C) the blood supply to a portion of the brain is cut off.
(D) a descending tract in the spinal cord is severed.
(E) brain stem nuclei hypersecrete serotonin.

26. Using the graph below propose a hypothesis to explain why, although prolactin is present throughout pregnancy, the breasts do not begin to secrete milk until after birth.



(A) Prolactin is in an inactive form prior to birth.
(B) Prolactin is present in insufficient quantities prior to birth to induce lactation.
(C) High oestrogen levels are necessary to change prolactin to an active form.
(D) Some other hormone must also be present for prolactin to have its effect. This other hormone is not present prior to birth.
(E) Oestrogen is in an active form prior to birth.

27. Which of the following is the correct sequence of organs involved in producing progesterone?
(A) Hypothalamus – anterior pituitary – ovary.
(B) Hypothalamus – posterior pituitary – ovary.
(C) Anterior pituitary – adrenal cortex – uterus.
(D) Posterior pituitary – adrenal medulla - ovary.
(E) Hypothalamus – ovary - uterus.

28. The midbrain of vertebrates is also called the
(A) medulla.
(B) mesencephalon.
(C) diencephalon.
(D) hypothalamus.
(E) cerebrum.

29. In humans and other primates, the hemispheres of the cerebrum are connected by a nerve tract called the
(A) pons.
(B) nerve net.
(C) thalamus.
(D) corpus stiatum.
(E) corpus callosum.

30. Which of the following is **not** part of the hindbrain?
(A) Pons.
(B) Medulla.
(C) Cerebrum.
(D) Cerebellum.
(E) All of the above are part of the hindbrain.

31. Extending from the uppermost part of the spinal cord and on through the brain stem is the …… .
(A) reticular formation.
(B) blood-brain barrier
(C) olfactory lobe
(D) tectum
(E) corpus striatum.

32. The occurrence of beard growth, enlargement of the larynx, and in some men, pattern baldness are all functions of
(A) LH.
(B) FSH.
(C) gonadotropins.
(D) testosterone.
(E) the seminal vesicles.

33. During each monthly ovarian cycle, how many oocytes undergo oogenesis?
(A) One.
(B) A few.
(C) 30.
(D) 90.
(E) 110.

34. During each monthly ovarian cycle, how many oocytes undergo oogenesis?
(A) One.
(B) A few.
(C) 30.
(D) 90.
(E) Two

35. What reproductive organ(s) of the female secretes fluid for vaginal lubrication during coitus?
(A) Uterine tubes
(B) pudendal cleft
(C) labia majora
(D) labia minora
(E) Vestibular glands

36. Which of the following hormones stimulates the maturation of reproductive structures in both male and female humans?
(A) Oestrogen.
(B) Follicle stimulating hormone (FSH).
(C) Progesterone.
(D) Testosterone
(E) Oxytocin.

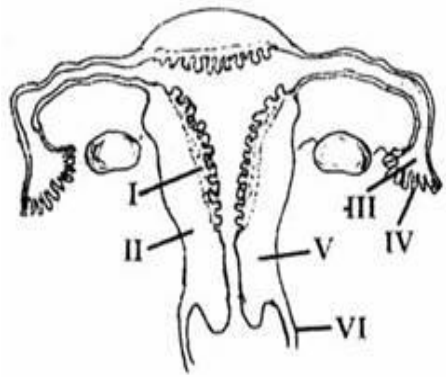
37. By the time of her birth, all of a woman's oocytes
(A) are premeiotic germ cells.
(B) have entered prophase of meiosis I.
(C) are oogonia.
(D) have entered the second meiotic division.
(E) have entered metaphase II.

38. Why does a follicle generally not develop during pregnancy in humans?
(A) The levels of oestrogen are too low during pregnancy to stimulate the development of a primary follicle.
(B) The levels of LH are too low during pregnancy to stimulate the development of a primary follicle
(C) The corpus luteum deteriorates during the early part of pregnacy. This reduces the amount of FSH present and the likelihood that a primary follicle will develop.
(D) High concentrations of oestrogen and progesterone inhibit the production and release of FSH.
(E) The absence of HCG reduces the likelihood that a primary follicle will develop.

39. Emotions of vertebrates are controlled by the
(A) pyramidal tracts.
(B) reticular system.
(C) cerebellum.
(D) corpus striatum.
(E) limbic system.

40. Which of the following is **not** one of the four lobes of a primate's cerebral hemisphere?
(A) Optic lobe.
(B) Parietal lobe.
(C) Frontal lobe.
(D) Temporal.
(E) Occipital lobe.

41. The figure given below depicts a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of I – VI have been correctly identified?



(A) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube
(B) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae
(C) (III) Infundibulum, (IV) Fimbriae, (V) Cervix
(D) (IV) Oviducal funnel, (V) Uterus, (VI) Cervix

42. Which of the following does **not** distinguish the nervous system from the endocrine system?
(A) Transmission of nervous impulses is more rapid..
(B) The nervous system uses chemical communication.
(C) Nervous system message are delivered directly to target cells or organs.
(D) The structural complexity of the nervous system allows for integration of more information and responses..
(E) The response of the body to nervous communication is more rapid.

Use the following information to answer questions 43 to 46.

Match the phase/event with its distinguishing feature(s):

(A) High oestrogen and progesterone; low FSH and LH.
(B) Low oestrogen and progesterone
(C) LH surge
(D) Increasing oestrogen; low LH and low progesterone.

43. Menstrual phase A

44. Follicular phase B

45. Luteal phase C

46. Ovulation C

47. A reliable biochemical test for pregnancy is to examine the blood or urine for the presence of
(A) LH.
(B) FSH.
(C) oestrogen.
(D) human chorionic gonadotrophin.
(E) progesterone.

48. Which hypothesis is consistent with the data presented in the table below?

Relative Level of Progesterone	Relative Level of Prolactin	Lactation ?
High	High	No
Low	High	Yes
High	Low	No
Low	Low	No

(A) Prolactin need not be present in order for lactation to occur.
(B) Progesterone must be present in order for prolactin to induce lactation.
(C) Progesterone levels must be low in order for prolactin to induce lactation.
(D) Prolactin will induce lactation irrespective of progesterone levels.
(E) The follicle must be present in order for prolactin to have an effect.

49. Semen is composed of
(A) secretions of the prostate and seminal vesicles.
(B) sperm and secretions of the prostate and seminal vesicles.
(C) sperm and secretions of the prostate, seminal vesicles, and interstitial cells of the testes.
(D) sperm and the secretions of interstitial cells and seminiferous tubules of the testes.
(E) sperm and the secretions of interstitial cells of the testes and epididymis.

50. The thalamus is a primary site of
(A) motor reflex coordination.
(B) visceral integration.
(C) sensory integration.
(D) hormone production.
(E) none of the above.

51. An automatic consequence or response to a nerve stimulation is called a(n)
(A) associative activity.
(B) coordinating centre.
(C) reflex action.
(D) afferent pathway.
(E) none of the above.

52. Side-to-side movements of the spinal cord are prevented by the
(A) filumterminale.
(B) denticulate ligaments.
(C) dura mater.
(D) pia mater.
(E) arachnoid mater.

53. Ascending tracts
(A) carry sensory information to the brain.
(B) carry motor information to the brain.
(C) carry sensory information from the brain.
(D) carry motor information from the brain.
(E) connect perceptive areas with the brain.

54. The pons contains
(A) sensory and motor nuclei for six cranial nerves.
(B) nuclei concerned with control of blood pressure.
(C) tracts that link the cerebellum with the brain stem.
(D) no ascending or descending tracts.
(E) both A and B.

55. A male birth control injection which inhibits spermatogenesis is currently being tested. It relies on additional amounts of the hormone
(A) progesterone.
(B) oestrogen.
(C) testosterone.
(D) LH.
(E) FSH

56. Which is the most effective form of birth control?
(A) female birth control pills.
(B) male vasectomy.
(C) male condom and spermicide.
(D) female tubal ligation.
(E) female intrauterine device.

57. Certain maternal diseases, drugs, alcohol, and radiation are most dangerous to embryonic development
(A) during the first 2 weeks when the embryo has not yet implanted and spontaneous abortion may occur.
(B) during the first 2 weeks when organogenesis is occurring.
(C) during the first and second trimesters when the embryonic liver is not yet filtering toxins.
(D) during the second trimester when the corpus luteum no longer secrets oestrogen and progesterone.
(E) during the third trimester when the most rapid growth is occurring.

58. The dural fold that divides the two cerebellar hemisphere is the
(A) falx cerebella.
(B) falx cerebri.
(C) transverse sinus.
(D) tentorium cerebella.
(E) tentorium cerebri.

59. Which of the following is incorrectly paired with its function?
(A) Seminiferous tubules- add fluid containing mucus, fructose, and prostaglandins to semen.
(B) Scrotum – encases testes and suspends them below abdominal cavity.
(C) Epididymis – stores sperm.
(D) Prostate gland – adds alkaline secretion to semen.
(E) Vas deferens – transports sperm from epididymis to ejaculatory duct.

60. Which of the following statements is **false** regarding progesterone in the human female menstrual cycle?
(A) It maintains the thickened uterine lining that forms in preparation for embryo implantation.
(B) It promotes the development of follicles.
(C) It is secreted by the corpus luteum.
(D) It inhibits release of hormones by the hypothalamus.
(E) It is a component of birth – control pills.

61. The ventral roots of each spinal segment
(A) bring sensory information into the spinal cord.
(B) control peripheral effectors.
(C) contain the axons of somatic motor and visceral motor neurons.
(D) both A and B are correct.
(E) both B and C are correct.

62. A sensory region monitored by the dorsal rami of a single spinal segment is
(A) a ganglion.
(B) fascicle.
(C) a dermatome.
(D) a ramus.
(E) grey mater.

63. How long is the refractory period for men after intercourse?
(A) Men don't have a refractory period.
(B) About 20 seconds.
(C) About 2 minutes.
(D) About 20 minutes.
(E) About 2 hours.

64. A woman had several miscarriages. Her doctor suspects that a hormonal insufficiency was causing the lining of the uterus to break down, as it does during menstruation, terminating her pregnancies. Treatment with which of the following might help her remain pregnant?
(A) Oxytocin.
(B) Follicle-stimulating hormone.
(C) Testosterone.
(D) Luteinizing hormone.
(E) Prolactin.

65. Damage to the vestibular nucleus would lead to
(A) loss of sight.
(B) loss of hearing.
(C) inability to sense pain.
(D) difficulty in maintaining balance.
(E) inability to swallow.

66. The Leydig cells as found in the human body are the secreory source of:
(A) glucagon.
(B) androgens.
(C) progesterone.
(D) intestinal mucus.
(E) ABP.

67. In the menstrual cycle, blood progesterone levels are highest during the
(A) follicular growth phase.
(B) time of ovulation.
(C) luteal (secretory) phase.
(D) first part of the flow phase.
(E) last part of the flow phase.

68. Which of the following statements is **true**?
(A) At the time of birth, the human female has produced all of the oocytes she will ever produce.
(B) At the onset of puberty, ovarian follicles produce new oocytes in response to hormonal stimulation.
(C) At the onset of menpause, the human female stops producing oocytes.
(D) Oocytes are produced by the human female throughout the adolescence.
(E) The oocytes produced by the female are kept “in storage” in the seminiferous tubules.

69. Coordination of learned movements patterns at the subconscious level is performed by
(A) the cerebellum.
(B) the substantia nigra.
(C) association fibres.
(D) the hypothalamus.
(E) cerebrum

70. Which one of the following statements is false in respect of viability of mammalian sperm?
(A) Viability of sperm is determined by its motility.
(B) Sperms must be concentrated in a thick suspension.
(C) Sperm is viable for only up to 24 hours.
(D) Survival of sperm depends on the pH of the medium and is more active in alkaline medium.
(E) Survival of sperm depends on the concentration of the thick suspension.

71. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was
(A) high levels of FSH and LH in the uterus to stimulate endometrial thickening.
(B) high level of circulating HCG to stimulate oestrogen and progesterone synthesis.
(C) high level of circulating FSH and LH in the uterus to stimulate implantation of the embryo.
(D) high level of circulating HCG to stimulate endometrial thickening.
(E) high level of circulating HCG, FSH and LH to stimulate endometrial thickening.

72. What is meant by a reflex arc in the nervous system?
(A) an inherited behaviour pattern that functions through a certain neural pathway.
(B) a functional unit consisting of a receptor, neural pathways and an effector.
(C) peripheral nerves, spinal cord, and brain.
(D) a homeostatic system of sensory nerves, synapses, and motor nerves.
(E) autonomic responses of the central nervous system.

73. If gonadotrophins (HCG, LH) from human placenta were injected into a mature male, one might expect to see
(A) an increase in oestrogen and progesterone.
(B) an increase in testosterone.
(C) a decrease in the activity of the testes.
(D) a 28 – day cycling of male hormones.
(E) increased sperm production by the testes.

74. Ovulation is caused by the hormone
(A) FSH.
(B) progesterone
(C) GRH.
(D) oestrogen.
(E) LH.

75. The only cranial nerves that are attached to the cerebrum are the ---------- nerves.
(A) optic
(B) oculomotor
(C) abducens
(D) olfactory
(E) auditory

76. Which of the following structures is incorrectly paired with its function?
(A) Pons – conducts information between spinal cord and brain.
(B) Cerebellum – contains the tracts that cross motor neurons from one side of the brain to the other side of the body.
(C) Thalamus – screens and relays incoming impulses to the cerebrum.
(D) Corpus callosum – band of fibres connecting left and right hemispheres.
(E) Hypothalamus – homeostatic regulation, pleasure centres.

77. The role of FSH in humans is to
(A) stimulate the development of the follicle in the ovary and production of sperm in the testes.
(B) stimulate the growth of the corpus luteum in the ovary and the production of sperm in the male.
(C) stimulate the interstitial cells of the male testes.
(D) stimulate the menstrual flow.
(E) stimulate uterine contractions at birth.

78. Which of the following statements is **false**?
(A) Most birth – control pills area mixtures of oestrogen and progesterone (or close analogs) designed to inhibit the hypothalamus.
(B) Vasectomy does not alter a man's endocrine system and hence should not reduce either sexual drive or sexual competency.
(C) Tubal ligation does not alter a woman's endocrine system and hence should not reduce either sexual drive or sexual responsiveness.
(D) The diaphragm is a birth – control device that, when properly fitted, covers the cervix and prevents sperm from entering the uterus.
(E) In the rhythm method of birth control, sexual abstinence on days 14 – 16 in each menstrual cycle reliably prevents pregnancy.

79. Association areas in the human brain are concentrated in the
(A) cerebral cortex.
(B) medulla.
(C) ventricle.
(D) hippocampus.
(E) meninges.

80. Which of the following is **not** a function of the spinal cord?
(A) controls many reflex actions.
(B) transmits information to the brain.
(C) transmits information from the brain.
(D) regulates sleep-wake cycles.
(E) controls the withdrawal reflex.

81. The visual centres are located in the
(A) parietal lobes.
(B) thalamus.
(C) occipital lobes.
(D) limbic lobes.
(E) frontal lobes.

82. If oestrogen level is low in a woman
(A) progesterone level is low as well.
(B) LH level is low as well.
(C) LH level is high.
(D) FSH level is low as well.
(E) FSH level is high.

83. Given the following glands:
1. prostate gland
2. bulbourethral
3. seminal vesicle

Choose the arrangement that shows the order in which the glands would contribute their secretions during the formation of seamen.
(A) 1, 2, 3
(B) 2, 1, 3
(C) 2, 3, 1
(D) 3, 1, 2
(E) 3, 2, 1

84. During a menstrual cycle…….. and…… prime the uterus for pregnancy.
(A) FSH; LH.
(B) FSH; testosterone.
(C) oestrogens; progesterone.
(D) oestrogen only.
(E) oxytocin.

85. During a menstrual cycle, a mid-cycle surge of…….. triggers ovulation.
(A) oestrogen.
(B) progesterone.
(C) LH.
(D) FSH.

86. After a sperm penetrates an egg, the fertilization membrane
(A) secretes important hormones.
(B) enables the fertilized egg to implant in the wall of the uterus.
(C) prevents more than one sperm from entering the egg.
(D) attracts additional sperm to the egg.
(E) activates the egg for embryonic development.

87. How does a zygote differ from an ovum?
(A) A zygote has more chromosomes.
(B) A zygote is smaller.
(C) A zygote consists of more than one cell.
(D) A zygote is much larger.
(E) A zygote divides by meiosis.

88. Progesterone is produced by the
(A) corpus luteum.
(B) hypothalamus.
(C) seminiferous tubules.
(D) pituitary gland.
(E) oviduct.

89. In the human brain, synaptic changes associated with memory occur primarily in the
(A) limbic system.
(B) cerebellum.
(C) reticular formation.
(D) hypothalamus.
(E) cerebral cortex.

90. If a person suffers cerebellar damage, he or she may difficulty
(A) breathing.
(B) swallowing.
(C) maintaining blood pressure.
(D) maintaining heart beat rate.
(E) playing cello.

91. The genitofemoral, femoral, and lateral femoral cutaneous nerves are major nerves of the
(A) lumber plexus.
(B) sacral plexus.
(C) brachial plexus.
(D) cervical plexus.
(E) thoracic plexus.

92. If an adult male jumped into a swimming pool of cold water, which of the following would be expected to happen?
(A) The cremaster muscles contract.
(B) The dartus muscles relax.
(C) The skin of the scrotum becomes loose and thin.
(D) The testes descend away from the body.
(E) The testes ascend towards the body.

93. What is the name of the vesicle at the tip of a sperm cell that contains enzymes that will help the sperm cell penetrate an egg cell it encounters?
(A) Scrotum.
(B) Acrosome.
(C) Amnion.
(D) Chorion.
(E) Prostate gland.

94. "Higher brain functions," such as speech and rational thought, are associated with
(A) the brainstem.
(B) the limbic system.
(C) the reticular formation.
(D) the cerebral cortex.
(E) the cerebellum.

95. The right cerebral cortex controls voluntary movements on the left side of the body because
(A) most people are right-handed.
(B) the right hemisphere dominates.
(C) many of the fibres in the funicle decussate in the medulla oblongata.
(D) many of the fibres in the funicle decussate in the spinal cord
(E) there is distinct cerebral specialization of hemispheres.

96. When you look at an intact human brain, what you see most is a large, highly convoluted outer surface. This is the
(A) cerebral cortex.
(B) medulla.
(C) cerebellum.
(D) reticular system.
(E) viscera.

97. Which of the following is correctly matched with its function?
(A) Interstitial cells (cells of Leydig) – testosterone production.
(B) Sertoli cells – nourish developing sperm cells.
(C) Seminiferous tubules – site of spermatogenesis.
(D) A and B.
(E) A, B and C.

98. Which of the following processes or phases in the menstrual cycle occur at the same time?
(A) Maximal LH secretion and menstruation.
(B) Regression of the corpus luteum and an increase in ovarian progesterone production.
(C) Menstruation and an increase in ovarian progesterone production.
(D) Ovulation and menstruation.
(E) Proferative phase of the uterus and increased oestrogen production by the ovary.

99. The lining or inner layer of the uterus is called the
(A) cervix.
(B) vagina
(C) labia.
(D) endometrium.
(E) epididymis.

100. The major secretory product of the mature follicle is
(A) oestrogen.
(B) progesterone.
(C) LH.
(D) FSH.
(E) GnRH.

101. In the dark, you step barefooted on a sharp object. What allows you to determine the exact nature and location of the pains stimulus?
(A) The neurons in your foot encode the information and send it to your brain.
(B) Your hurting foot.
(C) Specific portions of cerebral cortex are stimulated by the impulse.
(D) The action potential sweeping along the neuron.
(E) Your brainstem.

102. Secondary sex characteristics are
(A) the only body features that distinguish the sexes.
(B) not essential for the reproductive process.
(C) those structures that develop only after puberty.
(D) the only reproductive structures that are affected by hormones.
(E) are very essential for the reproductive process.

103. Following an auto accident, a man with an obvious head injury was observed stumbling about the scene. An inability to walk to properly and a loss of balance were quite obvious. What brain area was involved? Which hypothesis is consistent with the data presented in the table below?
(A) Cerebellum.
(B) Corpus callosum.
(C) Occipital lobe of cerebrum.
(D) Temporal lobe of cerebrum.
(E) Medulla oblongata.

104. A patient experiencing a fluctuating body temperature, lack of hunger and thirst, and psychosomatic disorders may have a malfunctioning
(A) cerebellum.
(B) hypothalamus.
(C) midbrain.
(D) medulla oblongata.
(E) thalamus

105. Birth control pills containing oestrogen and progesterone work by
(A) killing the sperm before they can fertilize the ovum.
(B) blocking the sperm from reaching the ovum.
(C) killing the ovum before it can be fertilized.
(D) blocking and killing the sperm.
(E) inhibiting the release of LH and FSH which stops ovulation.

106. Which of the following traces the path of sperm out of the body of a human male?
(A) epididymis, seminiferous tubule, vas deferens, urethra.
(B) seminiferous tubule, vas deferens, epididymis, urethra.
(C) epididymis, seminiferous tubule, urethra, vas deferens.
(D) seminiferous tubule, epididymis, vas deferens, urethra.
(E) seminiferous tubule, epididymis, urethra, vas deferens.

107. One of the major differences between the sexual response cycles in human males and females is the
(A) increase in blood pressure in males.
(B) increase in heart rate in females.
(C) presence of a refractory period in females after orgasm.
(D) presence of a refractory period in males after orgasm.
(E) increase in muscle tension in males.

108. A sudden surge in LH secretion causes the
(A) onset of menses.
(B) rupture of the follicular wall and ovulation.
(C) beginning of the proliferative phase.
(D) end of the uterine cycle.
(E) maturation of the follicle and menses.

109. The part of the brain that differs the most in complexity between mammals and amphibians is the
(A) forebrain.
(B) midbrain.
(C) cerebellum.
(D) limbic system.
(E) hippocampus.

110. What structure is cut and tied off in a vasectomy?
(A) The penis.
(B) The epididymis.
(C) The urethra.
(D) The seminiferous tubules.
(E) The vas deferens.

111. The two cerebral hemispheres are connected by
(A) the meninges.
(B) the cranium.
(C) the corpus callosum.
(D) the hypothalamus.
(E) the reticular formation.

112. The receptor cells in the olfactory epithelium are predominantly
(A) mechanoreceptors.
(B) chemoreceptors.
(C) thermoreceptors
(D) photoreceptors.
(E) pain receptors.

113. In the follicular phase of the ovarian cycle, the ovary is
(A) undergoing atresia.
(B) forming a corpus luteum.
(C) releasing a mature egg.
(D) secreting progesterone
(E) maturing a follicle.

114. Given the following structures:
1. ductus deferens
2. efferent ductule
3 epididymis
4. ejaculatory duct
5. rete testis

Choose the arrangement that lists the structures in the order sperm cells would pass through them from the seminiferous tubules to the urethra.

(A) 2, 3, 5, 4, 1
(B) 2, 5, 3, 4, 1
(C) 3, 2, 4, 1, 5
(D) 3, 4, 2, 1, 5
(E) 5, 2, 3, 1, 4

115. How does a zygote differ from an ovum?
(A) A zygote has more chromosomes.
(B) A zygote is smaller.
(C) A zygote consists of more than one cell.
(D) A zygote is much larger.
(E) A zygote divides by meiosis.

116. During oogenesis in mammals, the second meiotic division occurs:
(A) after capacitation.
(B) after implantation.
(C) before ovulation.
(D) before the acrosomal reaction.
(E) after a sperm enters the egg.

117. Which part of the brain maintains posture, muscle tone, and equilibrium?
(A) Cerebrum.
(B) Medulla.
(C) Cerebellum.
(D) Neocortex.
(E) Thalamus.

118. The human brain is protected by
(A) meninges, cerebrospinal fluid, and skull bones.
(B) meninges and skull bones only.
(C) dura matter and fourth ventricle.
(D) pia matter and skull bones.
(E) arachnoid, pia matter, cerebrospinal fluid and ganglia.

119. Given the following structures:
1. vaginal opening
2. clitoris
3. urethral opening
4. anus

Choose the arrangement that lists the structures in their proper order from the anterior to the posterior.
(A) 2, 3, 1, 4
(B) 2, 4, 3, 1
(C) 3, 1, 2, 4
(D) 3, 1, 4, 2
(E) 4, 2, 3, 1

120. In a withdrawal reflex, following reception, a signal is transmitted from a(n)
(A) motor neuron to an association neuron in the CNS.
(B) association neuron in the CNS to an afferent neuron.
(C) afferent neuron in the CNS to a motor neuron.
(D) sensory neuron to an association neuron in the CNS.
(E) sensory neuron to an association neuron in the PNS.

J. I. ADAM