University of Biskra January, 2026
Department of Veterinary Sciences *2nd Year Veterinary Doctor*

1st Exam in Reproductive Physiology (Normal session)

Fist Name…… Last Name …… Group…… **Mark…… /20**

Part I. Fill-in-the-Blank in the following statements. **(4.50 marks)**

1. Secretion of hypothalamic oxytocin in females is stimulated by……..
2. The surge mode of GnRH release at puberty depends on increased expression of……, a peptide produced by neurons located in the …….. nucleus, and is suppressed by prepubertal sensitivity to …….. in …… concentration.
3. Testicular descent in many mammals is facilitated by the swelling and regression of the ……., a ligament-like structure connected to the testes.
4. In many domestic species, puberty occurs with increased secretion of ……. in a ……. manner that causes a preferential rise in LH to activate steroidogenic cells.
5. In domestic mammals, follicular waves prior to puberty occur but do not lead to ovulation because …… cannot exert …….. feedback on the hypothalamus. Thus, the puberty-associated increase in ovarian follicle responsiveness to LH is mediated by ……. cell with the expression of CYP17A1, the enzyme converting ……. to …….. During ovarian follicular differentiation, ……..cells require FSH-dependent upregulation of the enzyme …….. to begin producing estradiol.
6. The neuroreflex responsible of fetus expulsion is called ……..
7. Sertoli cell proliferation occurs mainly before puberty, which is strongly stimulated by …… hormone.

Part II. Complete the following table by the accurate information. **(04.50 marks)**

Hormone	**Main Sources**	**Key Functions**	**Species particularities**
$PGF_2\alpha$	- **In female** …….. …… - **In male** ……, ……	- …….. - …… …… - …… ……..	**Ruminants** : …….. …… **Mare** : …… **Primates** : ……
Oxytocin	- …….. - …….	- …….. - …….. ……	
Placental lactogens		- …….. - ……	
Relaxin (in female)	……	- ……..	

	……	……	

<u>Part III</u>. Choose the correct answer (s). (11 marks)

Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11
Q12	**Q13**	**Q14**	**Q15**	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**	**Q21**	**Q22**
Q23	**Q24**	**Q25**	**Q26**	**Q27**	**Q28**	**Q29**	**Q30**	**Q31**	**Q32**	**33**
Q34	**Q35**	**Q36**	**Q37**	**Q38**	**Q39**	**Q40**	**Q41**	**Q42**	**Q43**	**Q44**

1. **Crucial factor involved in the organization of internal and external male genitalia is:**
   A. Müllerian-inhibiting factor
   B. Müllerian-stimulating factor
   C. Estrogen
   D. Androgen
2. **Which hormones are transported to the anterior pituitary by the portal system?**
   A. Oxytocin, GnRH, and dopamine
   B. GnRH, dopamine, and vasopressin
   C. Dopamine, vasopressin, and oxytocin
   D. Dopamine and GnRH
3. **Which of the following hormone initiates the parturition process?**
   A. Maternal prostaglandin and oxytocin
   B. Maternal progesterone
   C. Fetal cortisol
   D. Maternal relaxin
4. **The function of luteinizing hormone in the male animal is to:**
   A. stimulate the production of estrogen by Sertoli cells.
   B. stimulate spermatogenesis.
   C. stimulate the production of testosterone by Leydig cells.
   D. Activate 5alpha reductase.
5. **The theca interna:**
   A. is the outer cell layer of the primary and antral follicles.
   B. has LH receptors and secretes androgen.
   C. has FSH receptors and converts androgen to estrogen.
   D. secretes estrogen.
6. **Estrogen increases in the cow toward the end of gestation and has effects on lactogenesis by;**
   A. increasing lactotropic cells activity in the mammary gland
   B. preventing the formation of prolactin in hypophysis
   C. directing nutrients to the mammary gland for milk synthesis
   D. stimulating the secretion of prolactin
7. **Relaxin in male animals?**
   A. It is absent in males
   B. It is produced by the prostate
   C. It inhibits testosterone production
   D. it enhances sperm motility
8. **Which statement best describes the interrelation among these hormones?**
   A. Relaxin inhibits both oxytocin and $PGF_2\alpha$
   B. $PGF_2\alpha$ and oxytocin form a luteolytic loop
   C. Relaxin effects induce indirect release of Oxytocin
   D. $PGF_2\alpha$ stimulates progesterone release, reducing relaxin
9. **Chronic administration of a dopamine antagonist in cattle would result in:**
   A. Reduced milk yield
   B. Hyperprolactinemia and increased lactation
   C. Suppression of oxytocin release
   D. Inhibition of TRH
10. **Prolactin's anti-gonadal effects in some species are due to:**
    A. Stimulation of GnRH secretion
    B. Direct inhibition of steroidogenesis in Leydig cells
    C. Inhibition of GnRH and gonadotropin release
    D. Limiting the activity of pars tuberalis neurons
11. **The feedback effect of estrogens on the hypothalamic–pituitary axis :**
    A. Always inhibitory
    B. Inhibitory at low levels, stimulatory at high levels
    C. Always stimulatory
    D. Can increase Kiss1 production
12. **In ruminants, placental estrogens near term help:**
    A. Maintain progesterone production
    B. Induce uterine oxytocin receptors and stimulate $PGF_2\alpha$ release
    C. Inhibit myometrial contraction
    D. Suppress cervical dilation

13. **In the male, inhibin B levels reflect:**
    A. Leydig cell function
    B. Testosterone metabolism
    C. Sertoli cell activity and sperm production
    D. FSH secretion
14. **In female mammals, FSH secretion peaks:**
    A. During luteal phase
    B. Mid-luteal phase
    C. Before ovulation and after luteolysis
    D. During pregnancy
15. **In males, FSH stimulates Sertoli cells to produce:**
    A. Testosterone
    B. Estradiol only
    C. Progesterone
    D. Inhibin B and ABP
16. **The biotechnological application of inhibin immunization in farm animals primarily aims to:**
    A. Suppress ovulation
    B. Enhance ovulation rate and litter size
    C. Reduce testicular size
    D. Induce early puberty
17. **Peptide hormones, being water-soluble, generally exert their effect on target cells by :**
    A. Diffusing directly into the cell nucleus to alter gene expression.
    B. Binding to cell-surface receptors and activating second messenger systems (e.g., cAMP).
    C. Being transported across the plasma membrane by a carrier protein.
    D. Forming a hormone-receptor complex that directly cleaves target proteins.
18. **The posterior pituitary gland is best described anatomically as :**
    A. A true endocrine gland that synthesizes ADH and Oxytocin.
    B. A glandular structure connected by the hypophyseal portal system.
    C. A neural extension of the hypothalamus for hormonal storage.
    D. A region that secretes tropic hormones in response to humoral stimuli.
19. **Hormones regulating release of GH, FSH, and LH are collectively produced in the hypothalamus by :**
    A. Neuroglia cells in the posterior lobe.
    B. Magnocellular neurons in the supraoptic and arcuate nuclei.
    C. Parvocellular neurons that project to the median eminence.
    D. Parvocellular cells with large cell body lining the third ventricle.
20. **Function of Prolactin (PRL)?**
    A. Stimulating gonadal hormone production.
    B. Initiating the let-down of milk.
    C. Stimulating milk synthesis
    D. Inhibiting the release of GnRH during lactation in cows.
21. **During the estrous cycle of ruminants, $PGF_2\alpha$ release increases when:**
    A. Progesterone levels are high
    B. Oxytocin receptors are upregulated by estrogen
    C. FSH is maximal
    D. Luteolysis has already completed
22. **The countercurrent transfer of uterine $PGF_2\alpha$ to the ovary occurs via:**
    A. Uterine lymphatic drainage
    B. Utero-ovarian venous to ovarian arterial diffusion
    C. Systemic circulation only
    D. Cervical veins
23. **Which of the following inhibits $PGF_2\alpha$ synthesis during the luteal phase?**
    A. Estrogen B. Progesterone C. Oxytocin
    D. Cortisol
24. **In ruminants, $PGF_2\alpha$ pulses occur:**
    A. Every few hours for several days
    B. Once daily
    C. Continuously
    D. Only at ovulation
25. **The onset of parturition in ruminants is triggered by:**
    A. Fetal cortisol stimulating uterine PG synthesis
    B. Maternal oxytocin surge
    C. Prolactin drop
    D. Decline in FSH
26. **In dogs and cats, luteolysis is not primarily controlled by uterine $PGF_2\alpha$ because:**
    A. The CL is insensitive to $PGF_2\alpha$
    B. The uterus produces only PGE_2
    C. Luteolysis is mainly ovarian and local
    D. $PGF_2\alpha$ cannot cross the uterine–ovarian barrier
27. **Light suppresses melatonin synthesis by:**
    A. Inhibiting AANAT activity in pinealocytes
    B. Decreasing serotonin levels
    C. Blocking hypothalamic GnRH
    D. Enhancing norepinephrine release
28. **In long-day breeders such as mares, prolonged melatonin secretion:**
    A. Increases LH and FSH secretion
    B. Inhibits GnRH and induces anestrus
    C. Stimulates follicle development
    D. Induces T3 synthesis
29. **Melatonin's influence on thyroid hormones in the pars tuberalis affects reproduction by:**
    A. Changing local T_3 levels that regulate GnRH neurons
    B. Increasing systemic T_4 secretion
    C. Suppressing FSH directly
    D. Enhancing LH receptor expression in follicles
30. **In male seasonal breeders, elevated melatonin during short days causes:**
    A. Testicular regression in stallion

B. Testicular growth in all species
C. No testicular change in cows
D. Increased PL release

31. The photoneuroendocrine pathway controlling melatonin secretion involves:
A. Retina → Optic nerve → SCN → Superior cervical ganglion → Pineal gland
B. Retina → Thalamus → Pituitary → Pineal gland
C. Optic nerve → Cerebellum → Hypothalamus
D. Retina → SCN → Epiphysis

32. Artificial light programs are used in ewes to:
A. Prolong the luteal phase
B. Mimic long days and suppress melatonin for early cyclicity
C. Stimulate melatonin and induce estrus
D. Maintain the inhibiting E2 effects

33. The least invasive placental type is:
A. Hemochorial
B. Endotheliochorial
C. Epitheliochorial
D. Syndesmochorial

34. In mares, eCG acts primarily as:
A. A prolactin-like hormone
B. An LH-like hormone supporting CL
C. An FSH-like activity
D. A prostaglandin agonist

35. The switch from CL to placenta as the main progesterone source in mares occurs around:
A. 30 days B. 70 days C. 150 days
D. 300 days

36. Placental estrogens are synthesized from:
A. Progesterone of maternal origin
B. Cholesterol from maternal blood
C. Fetal androgens converted by placental aromatase
D. Oxytocin precursor peptides

37. Retained placenta in cows is often due to:
A. Hypocalcemia and failure of placental detachment
B. Excess oxytocin
C. High melatonin
D. Cortisol deficiency

38. The Whitten effect in rodents refers to:
A. Synchronization of estrus cycles by male pheromones
B. Pregnancy block by unfamiliar males
C. Acceleration of puberty by male pheromones
D. Aggressive behavior between males

39. The Flehmen response in many mammals is:
A. A specific behavior for volatile pheromones transfer
B. To transfer pheromones to VNO via Nasopalatine ducts
C. A behavior to draw pheromones into the vomeronasal organ from vaginal secretions
D. A reproductive reflex

40. In cattle, pheromones associated with estrus detection are found primarily in:
A. Vaginal mucus and urine
B. Sweat and saliva
C. Milk and feces
D. Blood plasma

41. Which neuroendocrine pathway links pheromonal detection to reproductive hormone release?
A. VNO → Amygdala → Hypothalamus → GnRH neurons
B. Olfactory bulb → Pituitary directly
C. Cortex → Thalamus → Pineal gland
D. VNO → Cerebellum Amygdala → Pituitary → LH neurones

42. In the ewe, the "ram effect" works by directly increasing:
A. FSH pulse amplitude
B. GnRH pulse frequency
C. Estradiol levels
D. LH levels

43. A ewe exposed to a ram shows increased LH pulses within hours. This phenomenon is mediated by:
A. Kisspeptin release
B. Increased estradiol
C. Decreased melatonin
D. Increased IGF-1

44. What is the key difference between the parvocellular versus the magnocellular neurons?
A. Parvocellular neurons release steroid hormones, while magnocellular neurons release peptide hormones.
B. Parvocellular products regulate another endocrine gland (the anterior pituitary), while magnocellular products directly target peripheral organs (kidney, uterus).
C. Magnocellular products are water-soluble, while parvocellular products are lipid-soluble.
D. Parvocellular products travel in the systemic blood, while magnocellular products travel in a localized system.

Good Luck
Dr. DAHMANE. A

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Part I. Fill-in-the-Blank in the following statements. **(4.50 marks) (18*0.25)**

8. Secretion of hypothalamic oxytocin in females is stimulated by **Cervical and vaginal distension**
9. The surge mode of GnRH release at puberty depends on increased expression of **Kisspeptin**, a peptide produced by neurons located in the **Arcuate** nucleus, and is suppressed by prepubertal sensitivity to **estradiol** in **low** concentration.
10. Testicular descent in many mammals is facilitated by the swelling and regression of the **Gubernaculum**, a ligament-like structure connected to the testes.
11. In many domestic species, puberty occurs with increased secretion of **GnRH** in a **pulsatile** manner that causes a preferential rise in LH to activate steroidogenic cells.
12. In domestic mammals, follicular waves prior to puberty occur but do not lead to ovulation because **estradiol** cannot exert **Positive** feedback on the hypothalamus. Thus, the puberty-associated increase in ovarian follicle responsiveness to LH is mediated by **theca** cell with the expression of CYP17A1, the enzyme converting **pregnenolone** to **androgens**. During ovarian follicular differentiation, **granulosa** cells require FSH-dependent upregulation of the enzyme **Aromatase** **(CYP19A1)** to begin producing estradiol.
13. The neuroreflex responsible of fetus expulsion is called **Fergusson reflex**.
14. Sertoli cell proliferation occurs mainly before puberty, which is strongly stimulated by **FSH** hormone.

Part II. Complete the following table by the accurate information. **(04.50 marks)**

Hormone	**Main Sources**	**Key Functions**	**Species particularities**
$PGF_2\alpha$ **2.25**	- **In female** Uterine endometrium - **In male** Seminal vesicles, prostate	- Luteolysis - Uterine smooth muscle contraction - Regulate epididymal sperm transport and motility	**Ruminants** : Uterine $PGF_2\alpha$ essential with local action. **Mare** : Systemic $PGF_2\alpha$ action. **Primates** : ovarian origin dominates
Oxytocin **01**	- Hypothalamus - Ovary (CL)	- Stimulates uterine $PGF_2\alpha$ release - Leads to expulsion of the fetus at the final stage of parturition	
Placental lactogens **0.5**		- Lactogenic and - somatotropic activity	
Relaxin (in female)	Ovary (CL)	- Relaxation of cervix and pelvic ligaments	

0.75	Placenta		

Part III. Choose the correct answer (s). (11 marks) (44*0.25)

Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11
D	D	C	C	B	D	BD	BC	B	C	B
Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
B	C	C	D	B	B	C	C	CD	B	B
Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	33
B	A	A	C	A	B	A	A	A	BD	C
Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44
B	B	C	A	A	BC	A	A	B	A	B