



বিদ্যাসাগর বিশ্ববিদ্যালয়

VIDYASAGAR UNIVERSITY

M.Sc. Examinations 2020

Semester IV

Subject: HUMAN PHYSIOLOGY

Paper: PHY - 401

(Theory)

Full Marks: 40

Time: 2hrs.

Candidates are required to give their answers in their own words as far as practicable.

Unit: PHY- 401.1

*Answer any **One** of the following questions*

1. a) Describe the synthesis of TRH showing the structural organization of TRH gene with suitable diagram. b) Elaborate the pituitary and extra-pituitary functions of TRH with special emphasis to its role as PRF.
2. a) Discuss about the unique blood supply in the pituitary gland with proper diagram. b) 'Functional development of the anterior pituitary cell types involves complex spatiotemporal regulation' - explain it. c) Write down a note on pituitary stem cells.
3. a) State critically the effect of plasma osmolality on plasma arginine vasopressin describing consequent effects on urine osmolality and urine volume. b) What are their relations to thirst? c) What is Diabetes insipidus?
4. a) How does Sodium-Iodide Symporter (NIS or SLC5A) take the responsibility for the synthesis of T_3 and T_4 ? b) With a schematic diagram briefly describe the iodine cycle during thyroid hormone synthesis. c) Describe the role thyroxin binding globulin (TBG) at the time of plasma transport of T_3 and T_4 . d) Write down the mechanism of cellular uptake and intracellular binding process of T_3 and T_4 . e) State the peripheral clinical manifestations of thyrotoxicosis.
5. a) Describe with a suitable diagram the histological organization of adrenal cortex. b) Schematically write down the process of adrenal steroidogenesis. c) State the permissive action of glucocorticoids. d) What is glucose fever? e) Write down the short term response (fight or flight) mechanism of adrenal gland during threatening homeostasis. f) Briefly discuss the regulatory mechanism of aldosterone secretion during low blood volume.
6. a) 'The major regulator of PTH secretion is the concentration of ionized calcium in blood' - Justify the statement with evidence. b) Describe the actions of parathyroid hormone on bone with special emphasis to the interplay of different bone cell types. c) What is CASR?



Unit: PHY- 401.2

*Answer any **One** of the following questions*

1. a) Describe critically the genetic regulation of male gonadal development mentioning the role of different transcription factors. b) Write down a note on Klinefelter syndrome. c) Elaborate the organisation of seminiferous tubule with special reference to its cell types. d) State the different phases of spermatid differentiation.
2. a) What is endometriosis (EM)? b) Write the localisation of it. c) State the incidence and prevalence scenario of EM among the women. d) Write the risk factors of EM. e) State the pathophysiological description of it. f) Endometriosis can induce the condition of cancer risk-Why? How β -hCG play a crucial role for the development of ectopic pregnancy?
3. a) Mention the source of ROS in male reproductive system. b) Describe the effect of oxidative stress on sperm plasma membrane, sperm motility. c) How sperm apoptosis is related to oxidative stress in male reproductive system? d) Describe different hormonal contraceptives.
4. a) Mention the importance of LIF and HB-EGF in implantation? b) What is syncytiotrophoblast and cytotrophoblast? c) Mention the role of matrix metalloproteinases(MMP) and their inhibitor(TIMP) in implantation. d) Mention the role of prostaglandin and oxytocin in parturition. e) What is brachystasis?
5. a) What do you understand by luteotrophic and luteolytic factors? b) Mention briefly the synthesis of sex steroids at the foeto-placental unit. c) What is transcortin? d) Mention its role in sustenance of pregnancy. e) Can 16 alpha hydroxy androstenedione be considered as a marker of foetal wellbeing?
6. a) Describe in details the cardiovascular changes of foetus during embryonic life. b) Write the nature of cardiac output and its distribution during embryonic life. c) According to RDA value how much amount of protein is required for foetal development and why? d) Briefly write down the terminal sac phase (24 to 36 weeks) of respiratory system of embryo. e) Write a short note on foetal growth factors. f) Mention the functions of foetal growth hormone.