

PHYSIOLOGY Qs**CNS**

LAQ (15MARKS)

1. a) Define synapse.
b) Discuss synaptic transmission of impulses in detail***.
c) Write about properties of synapses****.
d) Write about the types of synaptic inhibition****. (1+5+5+4)
2. a) What is a RECEPTOR?
b) Classification of Receptors.
c) Difference between Slow and fast adapting Receptors
d) Properties of RECEPTORS
(law of projection, physiological basis of Phantom Limb, Mullerian Doctrine, Lateral Inhibition Are Important). [1+5+4+5]
3. A. Discuss the components, connections and functions of BASAL GANGLIA.
B. Explain the pathophysiology of Parkinsonism(paralysis agitans) . Write about its clinical features and treatment [10+5]
4. 1. Describe the connections and functions of THALAMUS****. Add a note on thalamic syndrome. [10+5]
5. a) Describe the Origin, Course, Termination and Functions of Pyramidal Tract(Corticospinal) ****and Draw a neat Labelled Diagram of it.
b) Write about the effect of Lesion of Pyramidal tract at the level of Internal Capsule *
6. A. Describe the functional divisions, Connections of CEREBELLUM.
B. List out the Functions of cerebellum
C. Write about the effects of Cerebellar Disorders (or) Add a note on Cerebellar Disease.
7. Describe the functions of Hypothalamus in detail****.

SAQs & VSAQs

- 1) Renshaw cell inhibition.**** (3marks)
- 2) Difference between chemical and electrical synapse. (3marks)
- 3) write about EPSP and IPSP. (5marks)
- 4a) Define Reflex, Reflex arc. b) components of reflex arc. (2+3)

- 5) Write about properties of reflexes. (5marks).
6. Write about Stretch Reflex and inverse stretch reflex****. (5)
7. Write about Withdrawal reflex and Crossed Extensor Reflex. (5)
- 8.a) Describe Structure of Muscle Spindle****. (5)
- b) Write about its Nerve Supply. (5)
9. Write about mechanism activation of Muscle Spindle and also write about stimulation of GAMMA efferents on muscle spindle activity. (5)
- 10.a) Define pain.
- b) Differences between Fast and Slow pain.
- c) Describe the pathway of pain sensation with a neat diagram.
- d) What is REFERRED PAIN? and Write about the theories of referred pain
- e) Modulation of pain perception. [Gate control theory+ supraspinal pain inhibitory system]
- f) Write About One disorder of pain. [Hyperalgesia]
- g) Management or treatment of pain.
- [1+3+7+5+5+3+3]
11. Describe in detail about Dorsal Column/posterior columns. (5marks)
- [origin, course, centres in brain, sensations carried]
12. List out the Difference Between LMN and UMN. **** (5)
13. Write about the differences between Spasticity and Rigidity. (5)
14. Write a Short note on Hemisection of Spinal cord (Brown Sequard Syndrome)***** (5)
15. Write briefly about Somatosensory cortex (SS1 and SS2) (5)
16. Write a note on Decerebrate and Decorticate Rigidity. (5)
17. Where is area no. 44 located what are its functions. (5)
18. Write a short note on HEMIPLEGIA***. (5)
19. Components and functions of LIMBIC SYSTEM**** (5)
20. Add a note on (5)
- a) Shamrage
- b) Reward and punishment phenomenon.
- c) Papez circuit

21. Write about REM and NREM sleep (their genesis/mechanism and differences, changes in the body physiology) (5)
22. What is an EEG? Write briefly about the various waves consist in a Normal EEG? (5)
23. Motor Areas of brain.
24. Write a short note on Aphasia and agnosia.
25. What is Memory? Write about the types of memory.
26. Write the mechanism of long term memory and short term memory*****.
27. Add a note on Broca's and Wernicke's area.
28. Write about HEMIPLEGIA and PARAPLEGIA.
29. Discuss Antero lateral system (Spinothalamic tract).
30. Golgi tendon organ and its role inverse stretch reflex.
31. Write a few points about CLONUS. (3marks).
32. BABINSKI SIGN and its physiological basis. (3marks)
33. Synaptic Plasticity and mechanisms involved in it. (3marks)

SPECIAL SENSES

LAQS

1. Name the different parts of the Ear. Explain the mechanism of HEARING.
2. Explain with the help of a labelled diagram of VISUAL PATHWAY. Indicate the effects of lesions of the pathway at different levels.

SAQs & VSAQs

1. Accommodation reflexes. (5)
2. Near response of eye(3)
3. Pupillary reflexes (3)
4. Errors of refraction (Myopia & Hypermetropia) (5)
5. Astigmatism (3)
6. Difference between rods and cones (3)
7. Electrical events in photoreceptors (5)
8. Colour vision and theories Young-Helmholtz theory (5)
9. Colour blindness (5)
10. Light & Dark adaptation (5)
11. Night blindness (3)
12. Presbyopia (3)

13. Photopic and scotopic vision (5)
14. Near point and far point (3)
15. Functions of Iris(3)
16. Organ of Corti*** (5)
17. Functions of middle ear (5)
18. Impedance matching (5)
19. Tympanic reflex (3)
20. Types of deafness: Conduction deafness and nerve deafness (3)
21. Rinne's, Weber's and Schwabach test. (3)
22. Vestibulo-ocular reflex and nystagmus (3)
23. Endo cochlear potential (3)
24. Olfactory pathway (5)
25. Structure of taste bud (3)
26. Taste pathway (5)

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RENAL PHYSIOLOGY

LAQs

1. Define GFR and describe the factors influencing glomerular filtration ?
2. Describe the role of COUNTER-CURRENT MECHANISM in kidney / Formation of CONCENTRATED URINE
3. Describe the mechanism of Acidification of urine. Mention factors influencing H⁺ secretion.
4. Describe Reabsorption of glucose, Na⁺, H₂O. Add a note Diabetes Insipidus.

SAQS & VSAQS

1. Functions of kidney. (3)
2. JG apparatus*** (5)
3. Difference between cortical and juxtamedullary nephrons (3)
4. Peculiarities of renal circulation (any Five). (3)
5. Auto regulation of renal blood flow (3)
6. GFR: Factors affecting, normal value, measurement (5)
7. Nephrotic syndrome*** (3)
8. Transport maximum(T_{max})*** (3)
9. Tubuloglomerular feedback & Glomerulo tubular Balance. (5)
10. Draw and explain Cystometrogram*** (5)
11. Micturition reflex*** (5)
12. Abnormalities of micturition (3)
13. Bladder innervations/Nerve supply of Bladder(5)
14. Automatic and atonic bladder (5)
15. Tubular maximum for glucose*** (3)
16. Obligatory and facultative H₂O absorption (3)
17. Clearance tests(Urea, Inulin, PAH). (5)
18. Add a note on Diuretics of kidney*** (5)
19. Acid base balance (5)
20. Renin: Angiotensin Mechanism [RAAS]*** (5)
21. Splay*** (3)
22. Difference between osmotic and H₂O diuresis (5)
23. RFT, renal flow measurements (5)

24. Add a note Renal circulation. (5)

25. Erythropoietin(3)

26. Ultra filtration. (3)

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GIT

LAQs

1. Describe the composition, functions and regulation of secretion of GASTRIC JUICE (phases of secretion) .
2. Describe the composition, functions and regulation of secretion of PANCREATIC JUICE.
3. Describe the Mechanism of formation of HCL? Mention the Factors influencing it? Add a note on GERD*** (Gastroesophageal reflux disease) (7+5+3)
4. Describe the different types of INTESTINAL MOVEMENTS (small intestine) and their significance. Mention any three methods used for the study of intestinal motility.

SAQS & VSAQS

WRITE SHORT NOTE ON 📌

1. Nerve supply of GIT (3)
2. Saliva: Composition, functions, regulation of secretion (5)
3. Chordae tympani syndrome/Frey's syndrome*** (3)
4. Peptic ulcer (3)
5. Difference between duodenal and gastric ulcer (3)
6. Actions of gastrin and regulation of secretion (3)
7. Secretin (3)
8. CCK: PZ (3)
9. GI hormones (5)
10. Functions of liver (5)
11. A) Functions of gallbladder (3)
B) Formation and composition of bile and its functions (5)
12. Enterohepatic circulation*** (5)
13. Phases of deglutition (imp - 2nd phase) (5)
14. Gastric emptying time and the factors affecting it (5)
15. Hunger contractions (3)
16. MMC (Migrating motor complex) (3)
17. BER (3)
18. Vomiting mechanism (5)
19. Steatorrhea. (3)
20. Achalasia cardia (GERD) (3)

- 21. Functions of SI and LI (5)
- 22. Importance of dietary fibers (3)
- 23. Sham feeding***. (3)
- 24. LAWS OF INTESTINE. (3)
- 25. Succus Entericus. (3)

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TOPIC:NERVE MUSCLE PHYSIOLOGY.**LAQ**

1. a) Draw a neat labelled diagram of NEUROMUSCULAR JUNCTION(NMJ) and describe it.
- b) Enumerate the events which occur during its transmission.
- c) Add note on Myasthenia Gravis.
- d) Add a note on Drugs acting at NMJ.
2. a) Draw a neat labelled diagram of SARCOMERE and Describe it.[5]
- b) Write about Sliding filament theory of muscle contraction(Or excitation contraction coupling theory) . [5]
- c)Mechanism /Molecular basis of Muscle Contraction[5]

SAQS

1. Describe briefly the process ofWALLERIAN DEGENERATION & REGENERATION.
2. SALTATORY Conduction+Refractory period
3. MUSCLE FIBRES
 - a. Types b. Propertiesc. Differences(skeletal, cardiac&smooth)[write main important points, no need of deep explanation]
5. State All or Non Law. What is its significance?
- 6.What is Motor Unit? Explain about recruitment of motor units.
- 7)Write about Motor End Plate and Miniature End Plate Potential(MEPP).
- 8)Describe Sarcotubular system.
- 9)Mention two disorders associated with NMJ.
 - a) Myasthenia Gravis.
 - b) Lambert Eaten syndrome [2marks]
- 10)RIGOR MORTIS****. [3 marks]
11. Differences Between Slow contracting (red/Type 1) and Fast contracting (white/Type 2) muscle fibres..(5M)
12. Role of ATP in Muscle Contraction and Relaxation ! (3M)
- 13.Istonic and Isometric Contractions with Examples? (5M)

GENERAL PHYSIOLOGY:

LAQ [15M]****

1. a) Define HOMEOSTASIS?
- b) Write components of homeostatic system?
- c) Write detail about various FEEDBACK MECHANISMS with examples [positive and negative feedback]
- d) Write about FEED FORWARD regulation.

5. Write about various CELL JUNCTIONS [5M]

(study Tight junctions, gap junctions, anchoring junctions)

6. What is Apoptosis? (3M)

SKIN & MISCELLANEOUS**SAQs**

1. Triple response
2. Functions of skin
3. Role of skin in regulation of body temperature
4. Cardiorespiratory response to whole body Isotonic exercise.

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TOPIC :RESPIRATION

LAQS (15 MARKS)

1. Write in detail about Mechanism of BREATHING. (inspiration and Expiration)
2. Explain in Detail the Neural and Chemical Regulation of respiration*****.
3. Define HYPOXIA. Write about types of HYPOXIA*****.

SAQs (4×5=20marks)

1. Write about the Features of pulmonary circulation.
2. Add a note on Non Respiratory Functions of Lungs.
3. Pressure changes During breathing.
 - a) intrapleural b) intrapulmonary c) Transpulmonary
4. a) Define Lung Compliance.
 - b) Add a note on factors effecting it.
5. Define airway resistance. Add a note on factors affecting airway resistance.
6. Define surfactant through the following :
 - a) composition b) Source and secretion c) Functions****d) Respiratory distress syndrome
6. Define Minute ventilation. And write its formula (3marks)
7. Define Alveolar ventilation and write its formula. (3marks)
8. Write about LUNG Volumes and Capacities along with their normal values.
9. What is V/Q ratio? Mention the conditions in which it is Altered.
10. Add a note on principles governing flow of Air in Air passages.
11. What is asphyxia? What are the stages of asphyxia?
12. What is periodic breathing? Write about:
 - A) Cheyne Stoke's respiration B) BIOT'S Respiration C) Kussumaul's breathing
13. Write briefly about Acclimatization.
14. Write a short note on Acute mountain sickness.
15. Write a Short note on Caissons disease (Dysbarism).
16. Add a note on SCUBA. Enumerate it's parts.
17. Define APNOEA, hyperapnoea, tachypnoea, dyspnoea.

ENDOCRINE PHYSIOLOGY

LAQS

1. Describe THYROID HORMONE***:

Synthesis, transport and regulation of secretion? What are the actions of TH on metabolism? Give an account on Hypo and Hypersecretion of TH.

2. Describe Insulin: Secretion, action, regulation (regulation of blood sugar level)

3. Write about Glucocorticoids(CORTISOL)** : Action and regulation and its Applied aspects

4. Describe the Hormonal regulation of Calcium homeostasis & it's Applied aspects.

5. Describe ADH: Biosynthesis, action and regulation and applied physiology.

6. Write about Mineralocorticoids: Function, regulation and abnormalities.

7. Describe the functions/Physiological actions of the GROWTH HORMONE***. How it's secretion regulated? What are the effects of Hyper and Hypo secretion.

8. Describe the Hormones of Posterior pituitary and their functions. How is their secretion regulated?

SAQs & VSAQs

1. Hormonal regulation of glucose metabolism. (5)

2. Hormonal physiology of growth. (5)

3. Somatomedins(3)

4. Hypothalamo-hypophyseal axis (3/5)

5. Acromegaly (3/5)

6. Gigantism (3)

7. Dwarfism (3)

8. Difference between pituitary and thyroid dwarf (5)

9. Difference between T3 and T4 (3)

10. Hyperthyroidism (5)

11. Myxedema (3)

12. Diabetes mellitus: Types, clinical features (5)

13. Cushing's syndrome***. (5)

14. Glucagon (5)

15. Addison's disease (5)

16. Vitamin D actions (5)

17. Hormones of anterior pituitary (5)

- 18. PTH: Actions and regulations (5)
- 19. Hypocalcemic tetany (3)
- 20. Calcitonin: Actions (3)
- 21. Aldosterone escape (3)
- 22. Thyroid function tests*** (5)
- 23. Oxytocin: Action, regulation (5)
- 24. ADH: Action, regulation (5)
- 25. Mechanism of action of aldosterone (5)
- 26. Addisonian crisis (3)
- 27. Diabetes insipidus: Types (5)
- 28. Prolactin (5).

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CARDIOVASCULAR SYSTEM(CVS)

LAQs

1. Write in detail about properties of CARDIAC MUSCLE.
- 2.a) Draw the labelled diagram of the conduction system of heart.
b) Explain the pathway and its importance.
c) Add a note on Cardiac action potential. [3+8+4]
- 3.a) Define and give normal value of Cardiac output.
b) Briefly explain the factors regulating it.
c) Add a note on its measurement. [3+8+4]
4. a) Describe the events that occur during CARDIAC CYCLE.
b) describe volume & pressure changes in them. [9+6]
5. a) What is Blood Pressure ?
b) What is sBP, dBP, mAP?
c) Different methods of regulating Blood pressure.
d) Mechanisms of regulation of Blood pressure. (short term, intermediate, long term mechanisms)
[1+3+4+7]
6. What is SHOCK*****? what are the different types of shocks and write their causes & mechanisms.
7. Define HYPERTENSION***. Describe briefly the physiological principles underlying pathogenesis and management of Hypertension. [2+7+6]

SAQs and VSAQs

1. Write in detail about pacemaker potential. (5)
2. Draw a neat labelled diagram showing ECG waves and intervals and add a note on Einthoven's law*** (5)
3. Add a note JUGULAR VENOUS PULSE***. (5)
4. Describe Heart Sounds***. (5)
5. What is HEART RATE? and describe various regulations of heart rate. [1+4]
6. Add a note on MAREYS LAW. (3marks)
7. A) What is windKessel effect? Mention the physiological significance of it.
B) Add a note Laplace law. [5+3]
8. a) Cushings reflex b) Mareys law c) Brainbridge reflex d) Bezold jerisch reflex e) pulmonary chemo reflex
[3+3+3+3+3]

9. CORONARY CIRCULATION

- a) special features b) determinants c) Factors affecting coronary blood flow. [3 +4+3]

10. Physiological basis of:

- a) Angina pectoris b) Myocardial infarction

11. Mechanism of contraction and relaxation of a cardiac muscle****.

12. Write about the ECG changes in:

- a) myocardial infarction b) Hyperkalemia c) Hypokalemia

13. Wolf-Parkinson- white syndrome. (3marks)

14. Describe the following aspects of CORONARY BLOOD FLOW:

- a) Phasic flow
b) Metabolic regulation
c) Evidences of Myocardial ischemia. [3 +3+4]

15. Add a note on TRIPLE RESPONSE***.

16. WENKEBACK PHENOMENON. (3marks)

17. Describe the Starling forces**** that act across the capillary. How do they maintain fluid balance b/w blood and interstitial fluid?

18. Effect of Viscosity on flow of blood

BLOOD/HEMATOLOGY

LAQs

1. Define ERYTHROPOIESIS. Describe the stages of erythropoiesis and mention the factors affecting it*****.
2. Mechanism of BLOOD COAGULATION : Intrinsic and extrinsic along with its Applied physiology.
3. Describe ANEMIA : Classification, causes and symptoms.
- 4.A) What is Hemoglobin and What are its Functions?
B)What factors are required for Hg synthesis and discuss catabolism of Hg?
C) Define JAUNDICE. Mention the Types and Causes of JAUNDICE. (5+5+5).
- 5.What is the physiological basis of BLOOD GROUPING? Explain the blood groups and their Clinical Importance?

SAQs & VSAQs

1. Functions of blood (3)
2. Plasma proteins-functions and values (3)
3. Red cell indices (3)
4. ESR-clinical significance (3)
5. Hb- variants (3)
6. Fate of Hb (5)
7. Add a note on Heme-heme interaction (3)
8. Functions and properties of neutrophils (3)
9. Polycythemia (3)
10. Functions of platelets and their role in hemostasis (purpurias) (5)
11. Thalassemia (5)
12. Clotting factors (5)
13. Role of calcium in coagulation (3)
14. Platelet plug formation (3)
15. Hemophilia-types (5)
16. Arneth count (3)
17. Cellular immunity (3)
18. Humoral immunity (3)
19. Immunoglobulins (5)
20. Reticuloendothelial system (3)
21. Purpura (3)
22. Fibrinolytic system (3)

- 23. Landsteiner's law (5)
- 24. Rh incompatibility*** (Hemolytic disease of newborn)/Erythroblastosis fetalis (5)
- 25. Anticoagulants and their mechanism of action (5)
- 26. Cross matching (3)
- 27. Indications and complications of blood transfusion (3)

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REPRODUCTIVE PHYSIOLOGY

LAQS

- 1. Describe the hormonal, ovarian and uterine changes during MENSTRUAL CYCLE.

SAQs & VSAQs

1. Spermatogenesis & Factors influencing it (3/5)
2. Blood-testis barrier (3)
3. Functions of Sertoli cells (3)
4. Actions of testosterone and regulation (3)
5. Menstrual cycle graph with LH Surge (5)
6. Graffian follicle & Corpus luteum (3)
7. Actions of estrogen (5/3)
8. Actions of progesterone (3/5)
9. Fetoplacental unit (3)
10. Hormones of pregnancy, placental hormones (5)
11. Milk ejection reflex/Neuroendocrine reflex***/Suckling reflex(5)
12. Hormonal regulation of lactation (3)
13. Contraception (5)
14. Oral contraceptive pills and mini pills (3)
15. Cryptorchidism (3)
16. Pregnancy tests (3)
17. Indications, tests and regulation of ovulation (3)
18. Physiological changes during pregnancy (5)
19. Role of oxytocin in parturition (5)
20. IUCD (3)
21. Short note on PUBERTY*** & changes during it occurs. (5)
22. Seminal fluid and its composition (5)
23. Role of HCG in pregnancy(3)
24. Functions of placenta(3)
25. Sex determination(3)
26. Physiological Basis of anovulatory menstrual cycle. (3)

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