3 – THE CHEMISTRY BEHIND RESPONSES

MAJOR IDEAS

- **Homeostasis is maintained by the complementary activities of both quick neural and slow hormonal systems**
- **Different types of chemicals[Hormones] are secreted by endocrine glands. Though hormones are discharged in to the blood stream, each hormone act only in its target tissue, having specific receptors for accepting the same hormone.**
- **Thyroxine, Cortisol, Insulin, Glucagon, Somatotropin(growth hormone), Adrenalin & Noradrenalin are hormones, involved in metabolism.**
- **Aldosteron, Vasopresin(ADH), Parathormon & Calcitonin are hormones in salt-water balance.**
- **The stimulating hormones [Tropic hormones] influence the action of otherglands. TSH, ACTH & GTH are tropic hormones,secreted by the pituitary, under the influence of hypothalamus.**
- **Variation in the production of hormones results disorders like Dwarfism, Gigantism, Acromegaly,Myxoedema, Exophthalmic goiter, Tetany, Diabetes mellitus, Diabetes insipidus and kidney stone.**
- **Insects and other animals release certain chemicals, called Pheromones, to their surroundings,for communicating among the members of same species.**
- **The Phytohormones like Auxins, Cytokinins and Gibberellins are growth substances, while Ethylene,and Abscisic acid are growth inhibitors.**
- **Auxins influence in positive and negative phototropism, results in bent growth of stem or root.**
- **Artificial or synthetic plant hormones like NAA, IBA, 2,4-D, Ethylene and Ethyphon are useful chemicals , but these are to be used with utmost care.**

Now Find out The Answers

1. **The endocrine gland that seen in thyroid gland?**
2. **Hormone secreting 'ductless glands' are known as 'Endocrine glands'. Why?**
3. **How is it possible to act a hormone at its own target tissues?**
4. **The most important metabolic hormones?**
5. **Name the hormones, which are related with growth and development.**
6. **Why Adrenalin is termed as 'emergency hormone'?**
7. **How do adrenalin and noradrenalin prepare our body to overcome emotions like anger or fear?**
8. **The following hormones, except one, increase blood glucose level. Find out the hormone which decreases glucose level. [Cortesol, Thyroxine, Glucagon, Insulin, Adrenalin & Noradrenalin]**
9. **How is the quantity of water maintained in our body?**
10. **What is the normal level of calcium in blood? How is it maintained?**
11. **What is the normal level of glucose in blood? How is it maintained?**
12. **When a child conducted a test by adding Benedict's reagent to urine and then boiling, the colour of the solution became orange-red. What conclusion can arrive from this?**
13. **Migration of birds and fishes, Sleeping and waking up, Crow of cock in early morning, Hibernation etc. are examples for diurnal or seasonal rhythmic activities. How is this possible?**
14. **Name the gland which needs iodine. How the deficiency of iodine affects the gland?**
15. **Hormone used in the treatment of allergy diseases(like asthma) and inflammation (like arthritis)? Is it advisable to give this hormone to diabetic patients,having asthma or arthritis? Why?**
16. **Sometimes, pregnant women take oxytosin injection.Give reason.**
17. **Hormones, produced only in females;**
    Estrogens – Changes in adolescent period, growth of sex organs, production of ovum, menstrual cycle
    Progesteron – Menstrual cycle, pregnancy, fixing of embryo, development of uterus…
    Oxytosin – Facilitating child birth, ejection of milk
    Prolactin - Production of milk.
18. **Vasopresin is also known as anti diuretic hormone [ADH]. Why?**

19. Differentiate between the actions of tropic hormones and inhibitory hormones.
20. Define Releasing hormones ? How are they functioning?
21. Hormonal disorders

1.Goitre	**-Abnormal growth of thyroid lobes [bulged throat] due to iodine deficiency**
2.Exophthalmic Goitre	**The condition in which increased energy production , heart beat and appetite wth mental abnormalities and bulged eyes, due to over production of thyroxine(Hyperthyroidism)**
3.Cretinism	**- Retarded physical – mental growth in children, due to deficiency of thyroxine (Hypothyroidism) during early period of growth**
4.Myxoedema	**Inflamed condition of body in adult due to deficiency of thyroxine in adults**
5.Dwarfism	**-Stunted growth of bones due to under secretion of somatotropin in children**
6.Gigantism	**Growing tall and heavy due to over secretion of somatotropin in children**
7.Acromegaly	**-Enlargement of internal organs, thickening of bones[especially hands,feet and face] due to oversecretion of somatotropin in adults**
8.Diabetes Mellitus	**The condition in which high glucose level in blood,due to deficiency or inactivityof insulin**
9. Diabetes Insipidus	**-The condition of excessive loss of water through urine due to deficiency of ADH[vasopresin]**
10.Tetani	**A condition with muscle spasms due to decreased calcium level in blood by the deficiency of parathormone**

22. Compare between [1]- cretinism and dwarfism [2]- goitre and exophthalmic goitre
[3]-diabetes mellitus and diabetes insipidus
23.Find out the hormonal disorders of following
1- Insulin injection, diet control
2- Treatment with thyroxine tablets
3- Iodised salt,leafy vegetables and marine food items
4- Calcium contained food and tablets
24.Over production of parathormon makes the bone fragile. Give reason.
25. Name the two types of hormones of hypothalamus that control endocrine glands.
26 How is homeostasis maintained?
27. Define pheromones with examples. How are they useful?
28 What is pheromone trap?
29 Compare pheromones with hormones.
30. Certain phytohormones are known as 'growth substances'. Why? Give examples.
31. Name two growth inhibitors each from normal phytohormones and artificial plant hormones.
32.Synthetic / artificial plant hormones and their uses

NAA [NaphthaleneAceticAcid]	**To develop roots on stem, induse fruiting**
IBA [IndolButyricAcid]	**Prevent sprouting and dropping of fruits prematurely**
2,4-D	**Destruction of weeds**
Ethylene	**Induce flowering and fruit ripening**
Ethyphon	**Induce latex production in rubber plants**

33. Give examples for ocassions in which we utilize plant hormones in our daily life.
34. What will be the consequence if the production of abscicic acid stops in plants?
35. Plant hormone in the form of gas?
36. Plantain when keep under the influence of smoke, ripens quickly. Suggest reason.
37. Why plant stem grow bent towards the direction of sun light?
38. Compare the role of auxins in stem and roots.
39. Though artificial plant hormones are useful, its application should be with utmost care.Your opinion?