**SNS COLLEGE OF ALLIED HEALTH SCIENCE, COIMBATORE –35**
(Affiliated to the Tamil Nadu Dr M.G.R Medical University, Chennai)
**B.Sc. OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY**

**PUZZLE**
**1131 – BASIC SCIENCES - PHYSIOLOGY**
**UNIT V – DIGESTIVE SYSTEM, EXCRETORY SYSTEM AND REPRODUCTIVE SYSTEM**

## Reproductive System Physiology Logic Puzzle: Hormonal Regulation and Cycle Matching

**Scenario:** **Total marks: 10 marks**

A medical student is analyzing menstrual cycle phases and male reproductive physiology through hormone levels and gametogenesis. Key components include hypothalamus, anterior pituitary, ovaries/testes, follicular phase, ovulation, luteal phase, and spermatogenesis. A hormonal imbalance disrupts fertility, and the student must match each structure/process to its primary hormone(s), physiological role, and cycle timing or male equivalent. Only one role per component, ensuring feedback loop logic.

**Clues**:

1. Hypothalamus secretes GnRH in pulsatile fashion, stimulating pituitary; disruption causes hypogonadotropic hypogonadism affecting both sexes.
2. Anterior pituitary releases FSH (follicle stimulation, spermatogenesis) and LH (ovulation trigger, testosterone production); surge in LH induces ovulation.
3. Ovaries produce estrogen (follicular phase proliferation) and progesterone (luteal phase maintenance); corpus luteum forms post-ovulation.
4. Follicular phase (days 1-14) dominated by rising estrogen from growing follicles, thickening endometrium; ends with ovulation.
5. Ovulation occurs mid-cycle (~day 14) triggered by LH surge, releasing mature oocyte; estrogen peak precedes it.
6. Luteal phase (days 15-28) features progesterone from corpus luteum preparing for implantation; decline triggers menses if no pregnancy.
7. Testes (Leydig cells) produce testosterone under LH for spermatogenesis support and male secondary characteristics; constant vs. cyclic female pattern.
8. The fertility-disrupting imbalance affects pulsatile GnRH (hypothalamus), halting downstream pituitary-ovarian/testicular axes.
9. Negative feedback: high estrogen/progesterone inhibits GnRH/LH/FSH; positive feedback estrogen surge triggers LH for ovulation.

**Question**: Match each reproductive component to its hormone, role, and cycle phase, and identify which structure's disruption most directly causes infertility via hormonal imbalance.

**Rubrics**

| **Criterion** | **Points** |
|---|---|
| Key Elements | 2 pts |
| Logical Steps | 4 pts |
| Correct Solution | 2 pts |
| Biological Insight | 2 pts |
| **Total** | **10 pts** |