

5.7 Endocrine and reproductive physiology

Name: _____ Class: _____ Date: _____ **Total: 23 marks**

KEY WORDS negative feedback

Objective

Read hormone pairs as the axis diagram and date the cycle’s events.

1 Key knowledge and worked examples

■ **The grammar**

Releasing → trophic → effector → feedback at both higher levels. Primary failure = HIGH trophic; secondary = LOW both ✓. The cycle: oestradiol’s positive feedback flips the LH surge at mid-cycle.

■ **Worked example: TSH the amplifier**

TSH tracks free T4 log-linearly: a small T4 fall doubles TSH ✓ – the axis amplifies before symptoms.

2 Practice

2.1 Low cortisol with HIGH ACTH localises the failure where? [3]

2.2 What triggers the LH surge? [3]

2.3 Which pituitary product is stored hypothalamic hormone? [3]

3 Exam-style questions

3.1 Labs: free T4 low, TSH high.

Interpret using the axis. State the expected clinical picture. Contrast with low T4 and low TSH. Name one confirmatory test per direction. [7]

3.2 Amenorrhoea with high LH, normal FSH (fictional work-up).

Explain the feedback pattern (anovulation: no progesterone; oestradiol unopposed → positive feedback → LH high). Explain the endometrial risk. State the therapeutic logic. [7]

Solutions

2.1

- Primary (target-gland: adrenal) failure.

2.2

- Sustained high oestradiol switching to positive feedback.

2.3

- ADH (posterior pituitary: neural storage).

3.1

- Primary thyroid failure: feedback released, TSH high.
- Picture: hypothyroid (slow, cold, gaining); goitre possible (TSH is trophic).
- Low T4 + low TSH = pituitary/hypothalamic (secondary). Confirm: thyroid antibodies/TSH-receptor testing vs pituitary MRI/other axes.

3.2

- No ovulation → no corpus luteum → no progesterone feedback; high oestradiol drives LH (positive feedback) – the PCOS-pattern lab logic.
- Unopposed oestradiol → continued proliferation: hyperplasia and carcinoma risk.
- Logic: restore opposition (cyclical progestogen) and treat the anovulation cause.