6.6 Reproduction – summary of mark schemes

6.6.1 Draw and label diagrams of the adult male and female reproductive systems.

Mark Scheme

A. penis - shown with erectile tissue inside;
B. scrotum;
C. prostate gland - shown positioned where sperm duct connects with urethra;
D. sperm duct / vas deferens - shown linking to urethra;
E. urethra - shown linking bladder / upper side of prostate gland to end of penis;
F. seminal vesicle - shown branched off sperm duct (not off the urethra);
G. bladder;
H. testes / testis - shown inside scrotum;
I. epididymis - shown connected to sperm duct;
J. Cowper’s gland;
K. seminiferous tubules;
L. erectile tissue;
M. ovary;
N. oviduct / fallopian tube;
O. uterus;
P. cervix;
Q. vagina;
R. vulva / labia;
S. clitoris;
T. endometrium;

6.6.2 Outline the role of hormones in the menstrual cycle, including FSH (follicle stimulating hormone), LH (luteinizing hormone), estrogen and progesterone.

Mark Scheme

A. FSH is secreted at the start of the cycle / early in the cycle / days 1 to 5 / when progesterone / estrogen is low;
B. FSH stimulates the development of follicles;
C. FSH stimulates estrogen secretion (by the developing follicle);
D. estrogen stimulates the repair of the uterus lining;
E. rapid increase in estrogen stimulates LH production, (positive feedback);
F. low levels of estrogen initially inhibit FSH (and LH) secretion;
G. LH is secreted in the middle of the cycle / before ovulation / days 10 to 14;
H. LH causes ovulation;
I. LH causes the development of the corpus luteum;
J. LH causes secretion of progesterone;
K. LH stimulates less estrogen;
L. progesterone causes thickening of the uterus lining / prepares uterine lining for implantation;
M. progesterone / estrogen inhibits the secretion of LH / FSH;
N. falling progesterone levels at the end of the cycle allow FSH production / menstruation;
O. lower concentrations of estrogen and / or progesterone allow disintegration of endometrium / menstruation occurs;

6.6.3 Annotate a graph showing hormone levels in the menstrual cycle, illustrating the relationship between changes in hormone levels and ovulation, menstruation and thickening of the endometrium.

6.6.4 List three roles of testosterone in males.

Mark Scheme

A. pre-natal development of male genitalia;
B. development of male secondary sexual characteristics / name of specific characteristic;
C. maintenance of sex drive;

6.6.5 Outline the process of in vitro fertilization (IVF).
Mark Scheme

A. (IVF) is fertilization outside body / "in glass";
B. (drug) stops normal menstrual cycle;
C. (inject FSH) to stimulate ovaries / stimulate production of eggs;
D. (HCG) matures the follicles;
E. eggs are removed from follicles / ovaries / mother;
F. male provides sperm / sperm donor;
G. washing / capacitation of sperm;
H. eggs are mixed with sperm;
I. 2–3 embryos are implanted into uterus;
J. pregnancy test is done to see if implantation / pregnancy has occurred;

6.6.6 Discuss the ethical issues associated with IVF.

Mark Scheme

Arguments against (IVF):
A. fertilized egg has potential to become a person / some view a fertilized egg as having special status;
B. IVF requires the production of multiple embryos;
C. fate of extra embryos is ethical concern;
D. ethics of long-term storage;
E. stem-cell research is blurring issue as other cells now have the possibility of becoming a person;
F. procedure may result in multi-embryo pregnancy which places stress on the family resources / unwanted children;
G. issues of equity of access / expensive;
H. high rates of failure;
I. ownership / responsibility for stored embryos an issue;
J. religious opposition / playing God;

Arguments favouring (IVF):
K. only way some couples can have children / helps infertile couples;
L. allows for genetic screening;
M. allows for surrogate mothers;