**1.** D

[1]

**2.** C

[1]

**3.** D

[1]

**4.** C

[1]

**5.** A

[1]

**6.** B

[1]

**7.** C

[1]

**8.** A

[1]

**9.** A

[1]

**10.** A

[1]

**11.** A

[1]

**12.** D

[1]

**13.** C

[1]

**14.** B

[1]

**15.** A

[1]

**16.** (a) I: progesterone;

II: estrogen; 2

(b) FSH stimulates follicle development;  
FSH stimulates estrogen secretion (by the follicle/ovary); 2

(c) high levels of progesterone/estrogen inhibit FSH production (during pregnancy) 1

[5]

**17.** (a) letter U marked/labelled on uterus  
*Accept in lumen or on wall.* 1

(b) formation of the corpus luteum 1

(c) allows characteristics from both parents to appear in offspring;  
crossing over (during prophase 1) changes chromosome composition;  
produces gametes which are all different;  
random chance of which sperm fertilizes ovum;  
greater variation (resulting from sexual reproduction) favours survival  
of species through natural selection;  
*Accept independent assortment during meiosis from AHL.* 3 max

[5]

**18.** (a) *Award* ***[1]*** *for each of the following clearly drawn and correctly labelled.*

cell body — complete with nucleus and dendrites;

axon—shown longer than the longest dendrite, with the membrane drawn as a

continuous line;

myelin sheath — surrounding the axon, showing nodes of Ranvier;

motor end plates — not covered by myelin sheath and ending in a button / dot; 4

(b) heart muscle is myogenic / pacemaker;

rise in CO2 detected in medulla of brain;

nerve impulse sent to pacemaker;

sympathetic / parasympathetic control;

modifies heart beat;

SA node initiates contraction of atria;

impulses (from SA) cause AV node to contract ventricles;

transmitted through Purkinje fibres;

output rises;

CO2 level falls; 6 max

Allow converse of above

(c) (skeletal) muscle is composed of myofibrils;

operational unit is a sarcomere;

viewed as a series of light and dark bands;

thin actin fibres;

thick myosin fibres;

arrival of action potential;

release of Ca2+;

from sarcoplasmic reticulum;

exposes binding sites of myosin fibres;

ATP used to break cross bridges between myosin and actin fibres;

hydrolysis of ATP resets myosin head;

causing sliding of actin and myosin; 8 max

*(Plus up to* ***[2]*** *for quality)*

[20]