Sacred Heart Canossian College
Mock Examination (2020-2021)
S6 Biology – Marking Scheme

Paper 2

SECTION A Human Physiology: Regulation and Control

1. (a) (i) The LH level remains fairly constant / There is no LH surge over the period. (1)
Ovulation is not triggered. (1)

(ii) As the menstrual cycle length becomes much longer than normal, (1)
the uterine lining becomes excessively thick. (1)
Heavy menstrual bleeding results when this thickened uterine lining sheds. (1)

(iii) High levels of oestrogen and progesterone inhibit FSH secretion by the pituitary gland. (1)
Due to the low level of FSH in blood, follicle development stops and cysts do not develop. (1)

(iv) Levonorgestrel prevents pregnancy through inhibition on the LH surge, thus preventing ovulation. (1)
IUD prevents pregnancy through implantation of embryo. (1)
Some women like Mary see this as abortion / killing unborn child. (1)
OR
Levonorgestrel prevents pregnancy through taking it orally. (1)
IUD has to be inserted in uterus to prevent pregnancy. (1)
IUD is more painful / invasive than taking levonorgestrel / requires visit to doctor. (Not accepting general answers, e.g. taking drug orally is more convenient) (1)

Total: 10 marks

(b) (i) There was no change to the rate of nerve impulse production by neurone Type A, but the rate of neurone Type B has increased / doubled. (1)

(ii) Warm-sensitive (1)
Due to higher rate of nerve impulses at higher temperature. (1)

(iii) During exercise, strong muscle contractions generate a large amount of heat. (1)
This increase in body temperature stimulates the thermoreceptors in the hypothalamus. (1)
More nerve impulses via the warm-sensitive neurones / neurone Type B are sent to the heat loss centre in the hypothalamus. (1)
This brings about more nerve impulses sent to the sweat gland to increase in the rate of sweating. (1)

(iv) During exercise, the cardiovascular centre in the medulla oblongata sends more nerve impulses via the sympathetic nerve. (1)
The sympathetic nerve releases more noradrenaline, (1)
which stimulates the activity of the SA node of the heart. (1)
As a result, the heart beats faster and more strongly.

Total: 10 marks

SECTION B Applied Ecology

2. (a) (i) From 2007 to 2015, the total mass of cod caught decreased steadily. (1)
Any one of the following:
This is probably due to overfishing (1)
such that cod were caught at a rate higher than the cod population could replace themselves through reproduction. (1)
OR
Mesh size of the net was too small that even juvenile fish were caught. (1)
Thus this greatly reduced the reproduction rate within the cod population. (1)

(ii) Large quantities of non-target species including the prey of cod are removed from the sea by bottom trawling. (1)
As a result, less food is available to cod. (1)
The future cod population will decrease. (1)

(iii) Any two pairs of the following:
The species caught is more specific according to the bait (1)
so that bycatch is reduced. (1)
OR
The number of cod caught can be controlled (1)
by the number of hooks. (1)
OR
The damage to seabed habitats, which are the shelter and breeding grounds for many marine organisms, is reduced. (1)
Fewer food webs in the sea are affected and more food is available to cod. (1)

Total: 10 marks

(b) (i) The insecticide in the lake diffused into the phytoplankton. (1)
As the insecticide could not be broken down / degraded / metabolised / excreted by the organisms (1)
and it was fat-soluble such that it accumulated in fatty tissues of organisms. (1)
Therefore, it reached a higher level in the grebe as grebes fed on a large number of sunfish which in turn fed on a large number of phytoplankton. (1)

(ii) (1) Prevented disease / fungi from reaching crop plants. (1)

(2) Some weeds provided habitats / niche for beneficial insects / animals to stay in the conservation headland.
OR
Conserved more weed plants that were producers in the food web. (1)
This increased species diversity within the headland and enabled ecological balance. (1)

(3) Decomposers / bacteria / fungi carried out decomposition to form ammonium compounds. (1)
Ammonium compounds were converted into nitrates by nitrifying bacteria. (1)
Nitrates were taken up by plants to allow production of protein for growth. (1)

Total: 10 marks