

GCSE BIOLOGY

Topic Paper: 3.1 Drugs
Part 1 & 2 Mark Scheme

MARK SCHEME



79 Marks



- M1.** (a) (i) heroin / cocaine / nicotine
accept tobacco
ignore alcohol / cigarettes / cannabis / caffeine / coffee 1
- (ii) alters body chemistry / processes
ignore withdrawal symptoms / craving
ignore non-chemical effects on nervous system 1
- (b) any **two** from:
- increase in cannabis smoking increases (%) depression
greater effect in women
ignore women become more depressed / men less depressed
depression linked with / not directly caused by cannabis
ignore cannabis causes depression
not all cannabis smokers get depression 2
- [4]
- M2.** (a) any **two** from:
- (high) CRP / protein
(no) heart condition
allow health
(not high) LDL
over 50 / age
number of tablets (each day)
ignore time
ignore placebo / rosuvastatin
ignore number of people 2
- (b) any **one** from:
- tablet with no drug
allow fake (pill) / dummy (pill) / sugar / chalk (pill)
tablet that has no effect
allow drug that has no effect
tablet without chemicals
ignore vitamin / mineral pill
tablet that people thought contained statin **or** reference to psychological effect
ignore control / different statin 1



- (c) 17802 / large number of people **or** enough people
ignore control group / fair test / control variables
ignore time / repeats 1
- (d) any **one** from:
ignore cost
placebo group at risk of heart attack **or** to allow statin to be given to everyone
statin group 54% less likely to get heart attack **or** showed that statin worked **or**
showed trial (very) successful
ignore reliable
sufficient information gained / results conclusive
ignore got results early
unethical / unfair to carry on trial 1
- (e) to avoid bias **or** show impartiality **or** show results independent
allow manufacturers could cheat
ignore reliability
ignore could be sued / blamed if trial went wrong
ignore manufacturer would know which group got statin / placebo 1
- (f) any **two** from:
reduction in LDL
*allow improves LDL:HDL balance **or** LDL and HDL concentrations equal*
ignore less cholesterol
ignore more HDL
*do **not** accept less HDL*
reduction in (saturated) fats
reduces deposition of fat / cholesterol / LDL in walls of blood vessels
or
blood vessels less likely to be blocked with fat / cholesterol / LDL 2

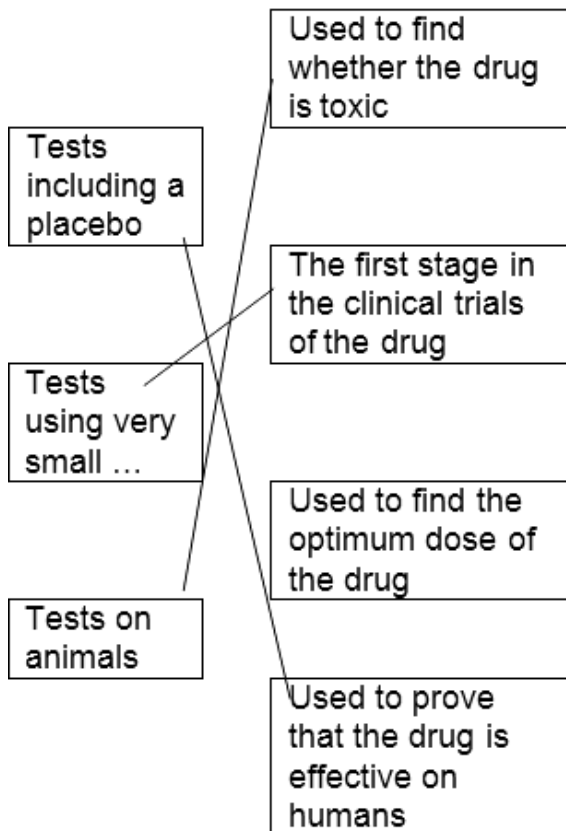


M3.

(a)

A

B



1 mark for each correct line

mark each line from left hand box

two lines from left hand box cancels mark for that box

3



(b) any **three** from:

Students have been informed that the headline is not justified

reference to reliability, eg only a small number of mice tested

or trial too short

or investigation not repeated

reference to control, eg mice given caffeine not coffee

or 6 cups (equivalence) is more than 1 dose

(and) the effect on mice might not be same as on humans

allow only tested on mice

(also) text suggests that the treatment improves memory loss (rather than delays it)

accept text suggests disease cured

or mice already have memory loss or experiment only showed improvement in memory

or does not show **delays** Alzheimer's

or experiment not done on old mice

allow reference to the fact that mice engineered to have it

3

[6]

M4. (a) both lead to reduction / fall (in measles cases)

can be implied

1

measles vaccine caused a big drop **or** correct use of figures

1

MMR wipes out measles **or** drops to (almost) zero **or** doesn't fall as much as measles vaccine **or** correct use of figures.

1

(b) mump(s)

1

rubella / german measles

either order

allow phonetic spelling

1



(c) white blood cells
allow lymphocytes / leucocytes
ignore memory cells 1

(wbc) produce antibodies
ignore antitoxins / antigens / antibiotics / engulfing 1

in future / if re-infected antibody production rapid / fast(er) / quick(er)
allow ecf from antitoxins / antigens / antibiotics
ignore engulfing
ignore reference to specificity 1

[8]

M5. (a) don't kill pathogens / bacteria / viruses / microbes / microorganisms
allow don't contain antibiotics
ignore antibodies / attack / fight
allow only treat symptoms / pain
ignore kill disease / germs 1

(b) any **two** from:
 age
 gender
 extent / severity of pain
or how long had pain before trial
 type of pain / illness / site of pain
accept 'the pain' for 1 mark, if neither extent or type given
ignore pain threshold
 (body) mass / weight / height
allow body size / physique
 other medical issues / drugs taken / health / fitness
 ethnicity 2

(c) (i) 75
ignore calculations / % 1



(ii) faster pain relief / decrease
allow pain relief sooner
or it works quicker
or more pain relief at start / in first $1 / 1\frac{3}{4}$ hours

1

(iii) decrease of pain higher / more
ignore more effective unless qualified by time $> 1\frac{3}{4}$ hours
allow effect lasts longer

1

decrease of pain is longer lasting

1

(d) any **three** from:
ignore yes or no

(Yes because)

- rapid pain relief (from A)
- long lasting pain relief (from B)
- and it costs less
- the sum of the pain relief (from A + B) is greater (than X)

(No because)

- drug X gives more pain relief
- (A + B / they) might interact with each other
- could result in overdose
- could be more / new side effects
- if neither points gained*
- allow (more) dangerous*

3

[10]

M6. (a) (i) idea of poor sleeping
allow as a sleeping pill

1

(ii) (for) morning sickness (in pregnant women)
ignore sickness unqualified
ignore leprosy

1



(iii) limb abnormalities / defects
accept description e.g. short / no arms / legs
ignore disabled / deformed 1

(iv) drug not tested / trialled on pregnant animals / women
allow not tested for treatment of morning sickness 1

(b) (i) changes to chemical processes
ignore addiction 1

(ii) dependency on (some) legal drugs is more than / equal to on (some) illegal drugs
allow idea of no / little consistency between dependency and classification 1

example of a named legal drug for which dependency is equal to **or** greater than a named illegal drug
allow two pairs of named examples for 2 marks 1

(iii) any **one** from:
the harm it does / harmfulness
ignore cost / addiction / dependency
effect on health
accept (severity of) withdrawal symptoms
side effects
*accept named health effects e.g. mental illness **or** effect on heart / circulatory system* 1

[8]

M7. A + B most effective (treatment)
ignore descriptions of LDL levels 1

D is (the most) effective (treatment)
D is the best single (treatment) 1

neither A nor B (alone) are effective
allow increase risk of heart disease instead of not effective 1

can't tell if C is effective
OR
A + C is not effective 1

[4]



M8. any **five** from:

maximum 4 marks if no conclusion

pros eg

maximum three pros

used 'teenage rats' as equivalent to human teenagers

THC dose typical of human cannabis smoking habits

used control group

rats allowed to choose amount of heroin

cons eg

sample size small / only used 12 rats

ignore cruelty

heroin administration very different from human situation

conclusions

rats given THC / cannabis took more heroin

(this) is evidence for a link between THC / cannabis and heroin

(but) rat behaviour / physiology not necessarily same as human behaviour / physiology

does not prove link in humans

allow results not reliable for humans

[5]

M9. (a) alters chemical reaction in the body

or changes brain / body functioning

or brain / body does not function correctly without drug

ignore references to dependence

1

withdrawal symptoms

allow crave / craving

1

(b) (i) (rises to a) maximum at 25-29 / 30-34 / 25-34

1

(falls to) minimum at 55-59

if neither mark gained allow 1 mark for indicating high usage anywhere in the 20-44 range

1



- (ii) any **two** from reference to eg:
ignore references to maturity / disposable income / stress

(peer) pressure / fashionable

experiment / try new things

ease of obtaining drugs 2
- (iii) some people will be dishonest / afraid to admit use
ignore sample not accurate 1
- (because) class A drugs illegal
or because they will get into trouble 1

[8]

- M10.** (a) (substance / chemical) that affects body chemistry / chemical reactions in the body 1



- (b) statin / aspirin / neither recommended
*no mark, may be implied. If no recommendation or implication,
max 4 marks
answers should be comparative*

any **five** from:

argued evaluation in favour of aspirin or statin or neither

answers could include reference to

*accept converse for statins / aspirin but **not** as advantage of one
and disadvantage of other*

for statins:

more people in studies

so data / findings more repeatable

accept reliable for repeatable

ignore accurate / precise

reduces cholesterol but aspirin doesn't

allow reduces cholesterol but no evidence about aspirin

aspirin (may) causes bleeding / poor clotting but statins do not

*allow aspirin causes bleeding / poor clotting but no evidence about
statins*

smaller (total) percentage suffer side-effects

monitored by doctor, aspirins not

for aspirin:

cheaper

can be bought over the counter rather than prescribed

statins cause serious damage / muscle damage / kidney failure but aspirins do not

similarities:

both have similar effect on reducing (non-fatal) heart attacks

incidence of side-effects low in both

allow (for aspirin) higher reduction of risk of heart attack



M11. (a) (i) any **one** from:

cells

tissues

(live) animals / named

allow mammals

1

(ii) any **three** from:

(to test for)

toxicity / check not poisonous / not harmful

allow side-effect

allow converse

interaction with other drugs

efficacy **or** to see if they work **or** check if they treat the disease

allow converse

dosage **or** how much is needed

3

(b) **argued evaluation**

*comparison can be written anywhere in evaluation allow use of 'only' for implied comparison for each point eg **only** statins damage muscles / kidneys / organs*

any **six** from:

statin can damage / muscles / kidneys / organs but cholesterol blockers don't

ignore liver

if neither of the first 2 points are given accept for 1 mark

statins can cause death but cholesterol blockers don't

*statins are more dangerous than cholesterol blockers **or** statins*

have more side effects

cholesterol blockers can interfere with action of other drugs but statins don't

statins are for a life time but cholesterol blockers are not

statins (might) reduce cholesterol to zero but cholesterol blockers only reduce it **or** statins reduce cholesterol more

allow statins (might) stop membrane / hormone production but cholesterol blockers don't



statins better for people with inherited high cholesterol

cholesterol blockers better for people with dietary cholesterol problems

taking/using statins/cholesterol blockers is better than dying from heart attack or build up of fat in blood vessels or reduced blood flow

6

[10]

M12. drugs alter chemical processes in body

1

person suffers withdrawal symptoms without drug

1