**1.** D

[1]

**2.** D

[1]

**3.** B

[1]

**4.** (a) (i) (GMF) C 1

(ii)  × 100;
=127% ; *(units required) (allow answers in the range of 127 to 127.3)* 2

(b) error bars show the range/variability/uncertainty of the data / *OWTTE*;
error bars/standard deviation about the same length for day 0 and day 11 /
spread of data (around the means) about the same;
overlapping bars indicate that there is no (significant) difference in the
data/ means;
68% of population within one standard deviation; 2 max

(c) inversely proportional / the higher the tolerance, the less the
growth / *vice versa* 1

(d) first name/*Oryza* for genus / second name/*sativa* for species;
(all) members of *Oryza sativa* share special/unique features;
two names make a unique combination to designate species / worldwide
recognizable nomenclature;
varieties (*japonica* and *indica*) have some (consistent) differences
(in tolerance); 2 max

(e) (i) *Sub1C* 1

(ii) *Sub1A* is expressed strongly/the most / *Sub1A* produces the
most RNA;
*Sub1B* (always) has the lowest expression/produces least
mRNA;
*Sub1A* expressed/produces mRNA for the longest
time/days 1 to 10;
*Sub1C* expressed/produces mRNA for the shortest
time/days 3 to 7; 2 max

(iii) *Sub1A* only expressed/produces mRNA in *indica* / not/never
expressed/never produces mRNA in *japonica*;
*Sub1C* expressed/produces mRNA from day 1 in *japonica*,
but not *indica*;
*Sub1B* has lower expression/production of mRNA than
*Sub1C* in both varieties;
other accurate comparisons; 2 max

(f) *Sub1A*;
is only expressed in *indica*;
*indica* is the variety showing submersion tolerance; 2 max

(g) genetically modified rice/rice with *Sub1A* is more tolerant to
submersion;
can withstand seasonal flooding/torrential rain;
GMF/tolerant rice ensures greater harvest/provides more food
during flooding; 2 max

[17]