

YEAR 10 REVISION - SEMESTER II EXAM

NAME _____

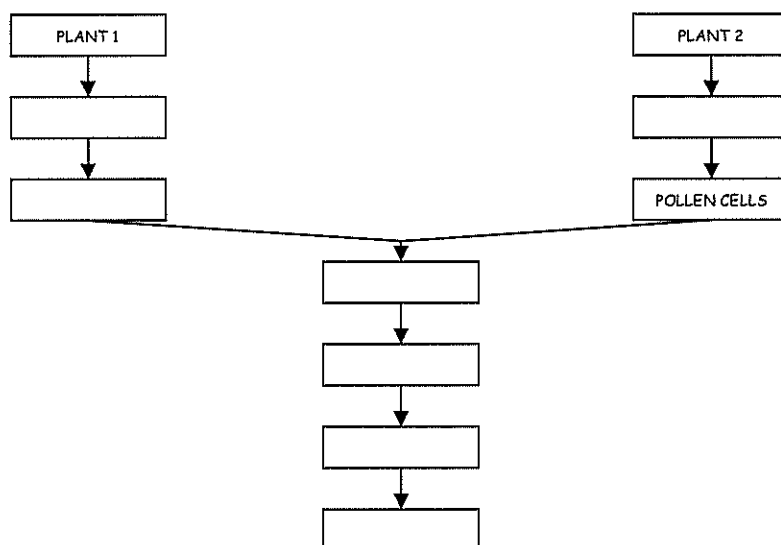
PHYSICS

1. What are the similarities and differences between average velocity and average speed?
2. A car takes 80s to complete one lap of a 2km circuit. What is its average speed and average velocity?
3. A cricket ball is thrown from the boundary to the wickets at a horizontal average speed of 28ms^{-1} . How long will it take to reach the wickets which are 90m away?
4. A train is moving with an average speed of 90kmh^{-1} . It takes 0.8 hours to reach its destination. What is the distance for the trip? (Give your answer in m.)
5. A person walks for 8 s at 1.3ms^{-1} , then another 6 s at 2ms^{-1} in the same direction. Find
 - a. the total displacement and,
 - b. average velocity
6. A cyclist travels around the Swan River in a circuit using the Narrows and Fremantle Traffic Bridges as crossing points. The cyclist travels at an average velocity of 25kmh^{-1} for the whole trip which takes 2.14hrs to complete by the time the cyclist reaches their departure point. What is the final displacement of the cyclist?
7. What was the total distance traveled by the cyclist in question 6?
8. A car changes its velocity from 25ms^{-1} to 36kmh^{-1} in 2.5s. What is the average acceleration of the car?
9. A ball rolling down a slope from rest is accelerated at 3.5ms^{-2} . What is the ball's velocity after 6s?
10. A plane flying at 174ms^{-1} slows down uniformly at 3ms^{-2} . What is the planes velocity after 28s?
11. A cyclist breaks suddenly with a uniform acceleration of -3ms^{-2} and slows to 3ms^{-1} in 1.3s. Determine the initial velocity of the cyclist.
12. A train initially at rest leaves a railway station with an acceleration of 0.46ms^{-1} for a period of 38s. find the :-
 - a. displacement
 - b. final velocity
 - c. average velocity for this part of the trip.
13. A person starting from rest takes 7s to reach terminal velocity down a slippery slope. Assuming a constant acceleration of 5.8ms^{-2} find the:
 - a. distance travelled in 7s
 - b. maximum velocity attained by the skier.
14. A car traveling at 42ms^{-1} can be stopped in 7.8s. find the:
 - a. acceleration
 - b. maximum distance required to stop the car.
15. Determine the distance required for a car to accelerate from rest to 110kmh^{-1} in 28s.
16. A stone is dropped from rest into a well. Find the depth of the well if it takes 0.69s for the stone to strike the bottom.
17. A ball is thrown vertically upwards at 13ms^{-1} . What is its velocity after 1.35s?
18.
 - a. State Newton's 3 laws of motion.
 - b. Paraphrase each law by describing it in your own words. Include any formula that will help you explain each law.
19. What force must act on a bitumen roller of 4 tonnes to produce an acceleration of 1.23ms^{-2} ?
20. What is the mass of a motor bike which is accelerated at 3.5ms^{-2} with a force of 350N?
21. A stationary mass of 12.6kg is acted on by a force of 12N for 6s. determine the:-
 - a. final velocity
 - b. displacement.
22. Find the weight of a student of mass 37kg.
23. A body of mass 60kg falls from a cliff. What is its weight force?
24. A body of mass 4.5kg at rest is acted on by an unbalanced external force equal to half its weight. After 3s determine:
 - a. velocity
 - b. displacement
25. NASCAR racing cars race on oval race tracks. They (obviously) slow down for the corners and speed up on the straits. Sketch a displacement-time, and a velocity-time graph for a car on one lap of the track. Match both graphs for time! Be prepared to explain your graphs.
26. Drums of mass 20kg are being loaded onto a ute over a vertical distance of 0.8m. Mr Muscle is showing off by lifting the drums vertically. Mrs Brain is rolling them up a ramp to get them onto the ute. The ramp is at 28° to the horizon. How much work is being done by each person?
27. Calculate the distance traveled by an object if 390J of work is done by an applied force of 33N.

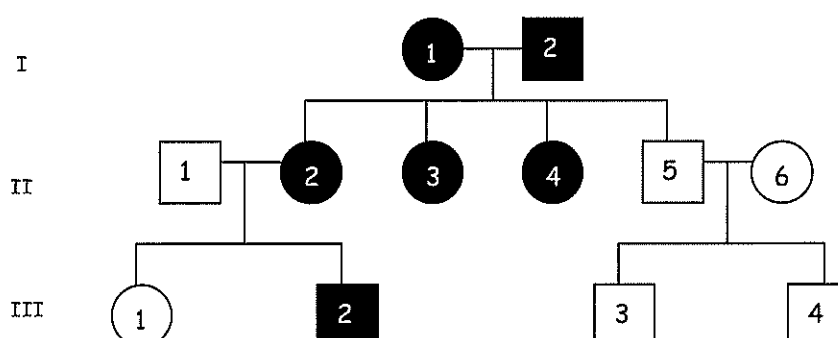
28. A fork-lift raises crates of mass 800kg to a height of 1.8m. How much work is done?
29. How much energy is transferred when a force of 440N is required to move a pot 5.3m across a floor?
30. A 400g branch falls to the ground. If 20J of energy is transferred, determine the height from which it fell.
31. Determine the velocity of an aeroplane of mass 0.75 tonnes which has a kinetic energy value of 4.5MJ.
32. A body of mass 25kg is accelerated from rest to 40ms^{-1} . What is its gain in kinetic energy?
33. A model rocket of mass 400g reaches a maximum height of 250m before beginning its descent back to earth. What is its maximum potential energy?
34. A brick of mass 980g is dropped from the top of a tower. How high is the tower if the velocity of the brick is 30ms^{-1} just before it hits the ground?
35. A Newton's Cradle contains 4 bobs each weighing 500g. At the end of the swing, the first bob is traveling at a speed of 0.74ms^{-1} . What will happen to the remaining bobs in the cradle? Support your answer with values for each of the bobs. Neglect any friction in the system.
36. A juggler is tossing 2 identical balls in and out of one hand. Each ball weighs 100g and is give an initial velocity of 23kmh^{-1} . determine the:
 - a. Kinetic energy and
 - b. Potential energy
 When its upward velocity has decreased to 5kmh^{-1} , and 0kmh^{-1}
37. For Q35 above, at what height will the potential and kinetic energies of a ball be the same?
38. A toy box is pushed along the floor by a child over a distance of 3m in 9s. If the force applied was 7N what power was used by the child?
39. A pen weighing 7g is accelerated at 5.6ms^{-2} for $\frac{4}{10}$ s. What power is used by the muscles in doing this movement?
40. A motor car with a power rating of 1300W is moving against a constant frictional resistance of 180N. What is the distance does it travel in 1 minute on a horizontal road?

BIOLOGY

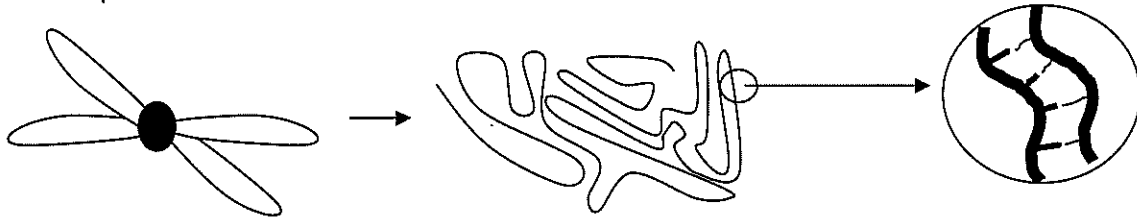
1. The onion plant has 14 chromosomes in the nuclei of its cells. Using this information and the following words correctly fill in the diagram. (DIPLOID, MITOSIS, FERTILIZATION, HAPLOID, NEW INDIVIDUAL, MEIOSIS, ZYGOTE, EGG)



2. Use the following family tree for astigmatism to answer question 2.



3. Is the condition dominant or recessive? Give the evidence for your answer.
4. Write down the genotypes for each individual.
5. Name the individuals for which we do not know their genotype?
6. If both individuals III 1 and III 2 married individuals that were heterozygotic for astigmatism, and each couple had one child, what chances would the respective couples have in producing a child with astigmatism?
7. Four O'clock plants' flowers can be red, white and pink. If a red and a white flowered plant were crossed, what would be the result of the first (F1) and second (F2) generations of offspring?
8. Give as much information as you can for the following diagram. Give the proper names and sizes for the various 'bits' that make up the structures shown.



9. The following list has the steps in natural selection jumbled. Un-jumble them into the correct order.

<ol style="list-style-type: none"> i. The environment changes ii. A greater proportion of the population now contain the beneficial genes iii. Mutation iv. If the environment changes in the same way in the future as it did in the past then less individuals of the population will die out v. A few individuals contain beneficial genes that help them survive the environmental change 	<ol style="list-style-type: none"> vi. Variation vii. 'Survival of the fittest' viii. The individuals that are benefited by their beneficial genes survive to a reproductive age. ix. The beneficial genes are passed on to the next generation.
--	--
10. Draw a labeled stick diagram to show how;
 - i. Dolly was formed.
 - ii. Human insulin is formed
11. What are the differences and similarities between gene slicing and gene splicing?
12. What are two ways that useful genes can be inserted into a crop plant? How does this compare to the "old way" of incorporating new genes into a crop?

