**Test 4\_15**

**Reading Passage 1**

New Regulations for Glymes

The vast majority of people may never have heard of them but glymes are in practically every household product available today. Alternatively known as dimethoxyethane, a glyme is a transparent, colourless, aprotic, and liquid ether which belongs to a broad family of chemicals called ‘glycol ethers’. Its inclusion in a huge range of products is gathering attention due to its potentially hazardous nature.

The US Environmental Protection Agency (EPA) announced in May 2011 a series of stringent regulations regarding glymes on account of recently highlighted health dangers. The EPA has classified three specific glymes as posing a severe danger to both production workers and consumers. Two types were additionally singled out, called monoglyme and diglyme, they were shown in EPA funded clinical animal trials to have generated reproductive and developmental damage in rodents. A third glyme, ethylglyme, also demonstrated in a number of cases a more alarming potential for gene mutation. It is clear from these results that prolonged exposure does have harsh side effects.

Monoglyme is primarily utilised as a solvent but can also be found in sealed lithium batteries, circuit boards and is harnessed in the production of cutting edge anti-AIDS drugs. It has been discovered in off-the-shelf office paper. The second glyme mentioned in the EPA study is diglyme found in printer cartridges, brake fluid and utilised in the manufacturing process of semiconductor chips. In the European Union, products containing monoglyme or diglyme are already regulated with mandatory warning labels explaining the possibility of infertility or baby malformations.

Professor Paul Maglone, chief medical researcher at the EPA states that ‘ethylglyme officially has no consumer use.’ Nevertheless, unconfirmed reports have been received by watchdogs of its inclusion in adhesives, detergents and dyes. More alarmingly, traces of it have been uncovered in drinking reservoirs in Canada and a number of undisclosed areas of the US. It is unclear at this point whether this is a result of a single case of pollution or if it is a part of the water treatment process. The latter of which would imply more long-term exposure.

In recent months, the US government health department has acknowledged the hazardous qualities of glymes. This has drawn more attention to the alleged negative impact they have upon factory workers who endure repeated exposure day upon day. Early research from the 1980’s funded by the University of New York unearthed a startlingly high percentage of miscarriages amongst female factory workers who handled glymes. Republished in the Journal of Medicine, the study has generated further debate on this topic which is highly justified due to the apparent severity of the New York results. Dr Sylvie Field, professor of chemistry at London city University and head of the British Chemical Scientific Research Organisation welcomes this renewed interest, stating ‘sadly, very little has changed since the original research.’

Independent research carried out in Holland from 2005 to 2007 measured the effects of glymes on rats and discovered that monoglyme appeared to cause testicular degeneration amongst males and suppressed bone marrow regeneration amongst 87% of subjects. The diglyme tests additionally noted a severe drop in sperm levels (69%) and deteriorated foetus growth which led to severe malformation of limbs and organs. As a result, miscarriages were common and a significant number of rodents died before and during delivery.

General public studies are literally non-existent thus very little is known about the amount of exposure the average person has to glymes and the effects thereof. While direct exposure to factory-level glymes appears to be restricted to workers only, the general public encounter glyme-rich materials and products virtually on a daily basis and it seems logical that if one group suffers then so does the other. Clearly, this is an area which requires a great deal more attention.

The recent EPA scare resulted in a multitude of whole-country bans but glymes are yet to draw much media and public attention. Nevertheless, governments across the world are waking up to the damaging effects of these substances. This latest EPA initiative would set stringent requirements for all companies involved with glymes at each stage of production to sales. Of more importance, is the mandatory requirement for all new uses of glymes to be approved beforehand to ensure limited risk to both workers and consumers. Existing glyme use would not, however, fall under this category and therefore be exempt from scrutiny. Dr Field is adamant to point out what he perceives as ‘the double standards portrayed by this move’ - one hand the government is admitting the danger of glymes and taking preventative measures, but on the other it is relinquishing responsibility for those which already include glymes.

**Questions 1 - 6**

Classify the following facts as referring to the type of glyme.

|  |  |  |
| --- | --- | --- |
|   | **A** | Monoglyme |
|   | **B** | Diglyme |
|   | **C** | Ethylglyme |

Write the correct letter, **A,** **B**, or **C** in boxes 1-6 on your answer sheet.

**1**       has the potential to change DNA

**2**        is used in the creation of medicine

**3**        an ingredient in the braking system of a car

**4**        it was detected in public water sources

**5**        damaged the reproductive organs of males

**6**        caused the premature death of some test subjects

**Questions 7- 9**

Answer the questions below using **NO MORE THAN THREE WORDS** for each answer.

Write your answers in boxes 7-9 on your answer sheet.

**7**       According to the EPA, what do some glymes represent to two groups of people?

**8**       In European countries what must all products which contain glymes have?

**9**       What will NOT require permission from the EPA?

**Questions 10 - 13**

Do the following statements reflect the claims of the writer in Reading Passage 1?

In boxes 10-13 on your answer sheet, write

|  |  |  |
| --- | --- | --- |
|   | **YES** | if the statement agrees with the information in the passage |
|   | **NO** | if the statement contradicts the information in the passage |
|   | **NOT GIVEN** | if there is no information about the statement in the passage |

**10**        There is escalating concern over the common inclusion of dimethoxyethane in products.

**11**        Glymes found in drinking water proves that the general public have experienced long-term exposure.

**12**        Debate will continue for many years over the dangers of glyme exposure to manufacturing staff.

**13**        The general public are exposed to factory-grade glymes every day.

**Reading Passage 2**



**A** Oceanic acidification is the most recent phenomenon to endanger coral reefs. Research conducted by the Florida Aquatic Life Organisation (FALCO) is shedding new light on why and how extreme acidity levels occur and the consequent effects on life forms which inhabit these reefs. Christopher Hamilton, chief researcher on the project, spent the majority of 2010 submerged beneath the ocean in the world’s only fully functioning underwater laboratory. Constructed from a revolutionary alloy and resembling a holiday caravan in appearance, the 15-metre long ‘Silver Whale’ housed a laboratory and testing facilities for its three rotating occupants, all leading experts in marine biology. The project was the culmination of almost a decade of planning and represented an unrivalled opportunity to collate primary data regarding the effects of acidity levels in waters surrounding a reef.

**B** The research study confirmed the beliefs of Hamilton and other marine biologists: that general increments in acidity pH levels during night-time hours and the opposite decrease during the daytime are a natural occurrence. Photosynthesizing algae absorb the vast majority of daytime carbon dioxide (CO2) produced through the respiration of animals and microorganisms. Thus, in the evening and at night this equilibrium is removed and CO2 and acidity levels increase. What Hamilton and his team found more startling were several unexpected discoveries which may prove more significant for the marine biology community at large. The first discovery confirmed the suspicions of countless academics and environmentalists: Hamilton’s crew recorded noteworthy pH changes in test samples not only from the reef but also the adjacent sand. Assistant researcher and marine biology student Sarah Brown comments that ‘this is a startling discovery and clearly demonstrates the escalating impact CO2 is having upon the marine environment’. Hamilton attributes this development to the incredible CO2 production capacity of sponge organisms which inhabit the reef and the surrounding area. Although these latest experiments did not include these creatures within their spectrum of test subjects, previous studies carried out by Hamilton and his colleagues in 2004 measured sponge water-pumping rates of up to an impressive 100,000 times their body volume per day. This substantial CO2 production is further exacerbated by other parasitic microorganisms housed within these sponges.

**C** Experiments centred on dye-release within the reef revealed a thin layer of water directly above the sediment showing clearly that the reef does not, as other scientists claimed, integrate itself for prolonged periods with the overlying water. Therefore, tentative report findings suggest that sponge and organism-generated CO2 may be diffusing at a sufficient rate to acidify the water. According to Hamilton, ‘if this is true then it could provide one explanation for the continual decrease in worldwide coral reefs.’ Acidification of this layer caused by escalating sponge generation appears to be a logical conclusion when their astonishing levels of CO2 capability are taken into consideration. Without rigorously tested scientific evidence, Hamilton’s assertion remains open to scepticism yet his report implies that this minute water layer may actually be the key to finally understanding oceanic acidification warning that ‘If this top living layer of coral does not reassert itself, then the reefs will eventually disintegrate.’

**D** Augmented levels of acid will undoubtedly continue to exacerbate the plight of the coral reefs and their inhabiting organisms. Reefs are home to a large variety of organisms, such as molluscs, crustaceans and echinoderms. A considerable proportion of these feed directly on coral, while others graze on algae which reside on the reef. In addition, there is the wealth of fish and even mammals living around the coral reefs that rely upon these life forms as a source of sustenance. For thousands of years there has been a natural equilibrium and so the depletion of the reefs as a viable food source for smaller creatures will have a subsequent effect throughout the food cycle. One of the findings in Hamilton’s research - which he attributes to reef depletion - details the plummeting range of marine life already around his test area in comparison to previous studies 20 years ago. According to the report, a 23 percent drop was noted in the amount of local fish alone and he cites statistically rigorous evidence to support his conclusion that ‘these figures are not just incidental, they are caused by receding reefs.’ Rising acidification levels cause the polyps in the reef to be eaten away by predators, devastated by disease, or simply become so stressed that they die. The resulting destruction of a viable food source will cause the creatures which dwell on the reefs to vanish from the area and eventually become extinct.

**E** General consensus around the world is that coral reefs are receding at an alarmingly rapid rate but because reef habitats are exceptionally complex and worldwide reef monitoring and mapping efforts only began in the late 1990s, scientists simply lack sufficient information to keep track of their destruction. Unfortunately, at this rate they may soon be beyond repair. The Global Coral Reef Monitoring Network (GCRMN), the largest coral reef monitoring organisation in the world, reported at the 15th International Coral Reef Symposium that 42 percent have already been lost and at least another 40 percent could disappear within the next 20 years. Hamilton is convinced his research laboratory has a unique role to play in addressing this issue and welcomes international experts in the hope that they will set up their own similar aqua observatory laboratories.

**Questions** **14-26**

You should spend about 20 minutes on **Questions 14-26** which are based on Reading Passage 2.

**Questions 14-17**

Reading Passage 2 has five paragraphs, **A-E**.

Choose the correct heading for paragraphs **A-D** from the list of headings below.

Write the correct number i-ix in boxes 14-17 on your answer sheet.

|  |  |  |  |
| --- | --- | --- | --- |
|

|  |
| --- |
| **List of Headings** |
| iiiiiiivvviviiviiiix | The negative impact of acidification on organisms which live in coral reef areas.The natural role of algae in balancing the amount of CO2 in sea waterA research project on water acidity levelsBiological explanations for escalating CO2 levels around coral reefsNew research: causes and effects of acidification in water around a coral reefCO2 produced by sponges is to blame for severe CO2 productionAn isolated water layer may help explain rising amounts CO2 in coral reef waterDecreasing amounts of sea life link to coral reef destructionThe hazardous phenomenon of oceanic acidification |

 |

**14**       Paragraph A

**15**       Paragraph B

**16**       Paragraph C

**17**       Paragraph D

**Questions 18-21**

Choose the correct letter **A**, **B**, **C** or **D**.

Write your answers in boxes 18-21 on your answer sheet.

**18**        What can be learned about carbon dioxide produced by sponges and organisms?

|  |  |  |
| --- | --- | --- |
|  | **A** | It could be the cause of acidified water. |
|  | **B** | It diffuses at a slow speed. |
|  | **C** | It is destroying the coral reefs. |
|  | **D** | It integrates in the reef water. |

**19**       What can be learned about the highest section of the coral reef?

|  |  |  |
| --- | --- | --- |
|  | **A** | It will fix itself in the near future. |
|  | **B** | It is the key to saving the coral reefs. |
|  | **C** | It is the only living layer of coral in the reefs. |
|  | **D** | It is responsible for oceanic acidification. |

**20**       What is stated about the amount of marine life near the reef?

|  |  |  |
| --- | --- | --- |
|  | **A** | It has decreased and shrunk the reefs. |
|  | **B** | It is measured every 20 years. |
|  | **C** | It shows a 23% fall in the area of the reefs. |
|  | **D** | It has fallen since 20 years ago. |

**21**       What does the writer state about scientists ability to monitor the destruction of the coral reefs?

|  |  |  |
| --- | --- | --- |
|  | **A** | They have an inadequate amount of information |
|  | **B** | They do not have the necessary equipment. |
|  | **C** | They cannot measure complex events. |
|  | **D** | The information they have is enough to measure the changes. |

**Questions 22-25**

Do the following statements agree with the views of the writer in Reading Passage 2?

In boxes 22-25 on your answer sheet, write

**YES** if the statement agrees with the information in the passage

**NO** if the statement contradicts the information in the passage

 **NOT GIVEN** if there is no information about the statement in the passage

 **22** Hamilton’s study was a unique research opportunity.

**23** Algae absorb more carbon dioxide at night.

**24** The research team did not make any surprising discoveries.

**25** There is much scepticism about this project.

**Question 26**

Choose the correct letter **A**, **B**, **C** or **D**.

Write your answer in box 26 on your answer sheet.

**26** Choose the most suitable heading for the Reading Passage 2?

**A** A recent study on the origins of carbon dioxide in the water around a coral reef.

**B** Underwater laboratory uncovers surprising results about coral reef destruction.

**C** New research: causes and effects of oceanic acidification on coral reefs, their surrounding area and life forms.

**D** 2010 research project sheds new light on soaring pH levels in organisms and marine life around a coral reef.

**Reading Passage 3**

**Informational Cascades**

The answer to how large, grassroots social movements emerge in the apparent absence of centralized control or public communication has intrigued theorists for decades. While it is almost certain that the development of communication-based technology plays a continuing contributory influence upon such movements, it is nevertheless, a phenomena which warrants interest. Mass group behaviour is one example of what sociologists refer to as *information cascades* during which average individuals in a population exhibit almost animalistic herd-like behaviour, as a result of making decisions based on the actions of other individuals rather than relying on their own personal information. Cascades are not constrained to the confines of social movements; they also appear in economic systems in physical infrastructure networks and complex organizations.

Informational cascades are most accurately understood from a social perspective and are linked to mass group or ‘herd behaviour’. University of California economists Susanne Bucholdt and Adam Hellin put forward the original notion of cascade theory which appears to seamlessly merge herd behaviour with the rational-choice approach in the social sciences which affirms the rationality of individuals being solely dependent on information received from other people. Sourcing information can be expensive in terms of time and money, so individuals who purchase information will only continue to do so as long as it offers greater benefits to utilising free and readily available ‘public’ information - the opinions or behaviour of others. At such a moment in time, when every person depends on this ‘public’ information, an *informational cascade* is born.

Sequential models of cascades have branched out to take into consideration the inherent correctness of choices and so the main division is between a correct or incorrect choice. In a situation where everybody in a cascade adopts on the grounds that adopting appears to be the singular correct choice an ‘up cascade’ is in effect, in comparison to a ‘down cascade’ where an incorrect choice is chosen for some logical reason. Regardless of this choice, the precursor to any cascade is the reception of a private signal by an individual. This could be any form of private information: a television advertisement, a newspaper column or even an informal conversation with a colleague. If the signal in question is given more significance than other individual signals then the receiver makes a personal choice based upon the private signal because there is no evidence of others’ prior decision making which he or she can emulate. Theorists believe that ‘down cascades’ begin at this point because the signal is misinterpreted. The following person is then faced with two mutually exclusive alternatives: adopt or reject the first person’s behaviour. A majority of theorists argue that adoption, which is more often than not the case in an ‘up cascade’, brings superior benefits than rejecting. The next individual receives a private signal, but he/she will also benefit from public information because they can observe what the first person has done and the accrued positive benefits. As a result, this individual will be more inclined to adopt. At this stage there are two individuals displaying the same behaviour resulting from identical choices of adoption. Whether the next person receives a private or public signal he or she is still statistically more inclined to adopt and more people will follow making the same decisions based entirely on public information. No additional information is conveyed and the probability of a cascade approaches certainty as both the precision of the signal and the number of individuals increase. This is surprisingly also true in a down cascade where an incorrect message has been spread and adopted without question.

Informational cascades are especially effective for the spreading of accurate and truthful information at a relatively low cost to the producer and receiver. This is shown in advertising where high percentages of audiences correctly adopt the message as in the ‘up’ version. Yet, these cascades can be fuelled by inaccurate or erroneous information. Lots of people can be wrong for a long time and as a cascade develops and intensifies the likelihood of someone not following is statistically minimal. Examples of ‘inaccurate cascades’ include unfounded global environmental scares which gather momentum and followers until the truth is unmasked, whereby many members backtrack and renounce their adoption. The most damaging scenario is one in which real public policy responds to a partial or entirely incorrect message. A case in point being the vast overestimation of the potential of passive smoking in public places to cause lung cancer which is due to anti-smoking bans and government health campaigns. Westminster University Professor Bill Clarke, an expert on cascade theory and statistics, claims that if the risk were to be accurately calculated not only would people be unconcerned about being in the vicinity of smokers but the number of smokers would actually rise by between 5.2 to 7.5%.

There are valid reasons to believe that these incorrect cascades can be reversed by free-spirited, credible individuals but who must obtain, and act upon, correct private information and not listen to and follow the signals they are receiving. In this sense they renounce the herd and may lead to the destruction of the cascade altogether or, quite possibly, the birth of a new one. As simple as it sounds, however, it seems implausible that once a cascade has started, nobody within it will want to risk damage to their credibility by going against the herd and rejecting a common opinion or behaviour.

**READING PASSAGE 3**

You should spend about 20 minutes on Questions 27-40 which are based on Reading Passage 3.

**Questions 27-31**

Complete each of the following statements (Questions 27-31) with the best ending **A-G** from the box below.

Write the appropriate letters **A-G** in boxes 27-31 on your answer sheet

**27** People demonstrate animal-like group behaviour in………………

**28** An informational cascade emerges when everyone depends on…………………

**29** The correctness of the choice is a key factor in………………..

**30** Up and down cascades blend……………………

**31** Before a cascade can begin, an individual must receive………………….

|  |  |
| --- | --- |
| **A** | rational choice and mass group behaviour. |
| **B** | a private signal. |
| **C** | public information. |
| **D** | cascade theory. |
| **E** | informational cascades. |
| **F** | the behaviour of animals in a large group. |
| **G** | decisions made outside a cascade. |

***Questions 32-37***

Classify the following facts as referring to the correct type of cascade.

|  |  |  |
| --- | --- | --- |
|   | ***A*** | *Down cascades* |
|   | ***B*** | *Inaccurate cascades* |
|   | ***C*** | *Up cascades* |

*Write the correct letter* ***A, B or C*** *in boxes 32-37 on your answer sheet.*

**32** adoption is chosen by every member of the cascade because it is the best choice

**33** is the most beneficial option for the individual

**34** the receiver of a message makes a decision based on a message he/she does not understand correctly

**35** whole populations sometimes believe wrong information

**36** advertisements successfully persuade audiences to believe a certain message

**37** members of the cascade do not question the validity of their choice

**Questions 38-40**

The list below gives possible characteristics of cascades.

Which **THREE** of the following characteristics of cascades are mentioned by the writer of the text?

Write the appropriate letters **A-F** in boxes 38-40 on your answer sheet.

**A** Cascades are confined to social movements.

**B** Being reliant on information from others is entirely rational.

**C** Individuals will continue to buy information.

**D** The first person in a cascade cannot be influenced by other people’s choices.

**E** Cascades damage the credibility of their members before the cascade starts.

**F** Cascades discourage members rejecting the behaviour of the group.