1. Why are 3D printers remarkable?

____ because they can produce different kinds of objects, in different materials, all
from the same machine___

2. If everything could be printed, this would mean, people wouldn’t need ___ trucks to deliver
goods or warehouses to store them in.

3. Write one specific advantage of using 3D printing in hospitals

____ they will spend less time in the operating room, patients will spend less time under
anesthesia, and fewer risk of infection/Doctors claim they have a better surgical outcome
by practicing patients’ anatomy on a customized 3D printed model____

4. Scientists are now able to print entire organs using 3D printers.  T/F(not entire)

5. Give one example of possible uses of 3D printing in the fashion industry.

___ you can create a specific textile that is waterproof and flexible
___ designers are free to create complex geometries and structures which are not only
aesthetically pleasing, but can add smart functionality__

For example, instead of using traditional buttons, we can create locking functionality
directly into the textile itself___

6. Why is 3D printing not convenient for mass production?

___3D printers consume a lot of energy and are therefore better suited for small batch
production ____

7. At present plastic is favored in 3D printing because ___ easily melts so the final version
of the product is formed quickly ____ , but it may not ___ be the best for some
components________ as it has varying levels of strength.

8. In what way does 3D printing harm the environment?

___ can generate potentially toxic emissions and carcinogenic particles__

___3D desktop computers could emit large numbers of ultrafine particles and some
hazardous compounds the machines still leave unused or excess plastic in the print
beds__. 

_The plastic byproduct ends up in landfills negatively affecting the environment_.

9. to create card readers for bank machines/ design and production of unlicensed
weaponry will increase/ anyone with a product blueprint can forge products
10. As patent violations are becoming more common, identifying imitated items will become impossible.

11. How can 3D printing affect economy?

Because 3D printing doesn’t require a lot of man power, it may lead to a decrease in manufacturing jobs.

12. According to professor Hellington, how should manufacturers and product designers approach 3D printing?

Manufacturers and product designers need to see it as complementary production system.
While Listening

Sheila: Good morning Professor Hellington.

Hellington: Good morning Sheila. Come on in and have a seat. How are you?

Sheila: Thank you professor. I am a bit tired because I have been working on my presentation regarding 3D printing as you know.

Hellington: How is the presentation coming along?

Sheila: I’ve been doing some research but reliable information is limited, therefore I have some questions for you.

Hellington: I will do my best to help you in this case.

Sheila: Thank you professor. May I start with my first question then?

Hellington: Sure

Sheila: I checked many sources but I couldn’t find a clear definition of 3D printing. Can you please simplify that for my presentation?

Hellington: Sure I can. The definition of 3D printing is quite technical. However, if you’d like me to put in a nutshell, I can say that 3D printers are a new generation of machines that can make everyday things. They’re remarkable because they can produce different kinds of objects, in different materials, all from the same machine. 1

I. Can you give some examples of those everyday objects professor?

Hellington: Sure. A 3D printer can make pretty much anything from ceramic cups to plastic toys, metal machine parts, fancy chocolate cakes or even (one day soon) human body parts. They replace traditional factory production lines with a single machine; just like home inkjet printers replaced bottles of ink, a printing press, hot metal type and a drying rack.

There are different 3D printing technologies and materials people can print with, but all are based on the same principle: a digital model is turned into a solid three-dimensional physical object by adding material layer by layer.

Have you ever broken something, only to find it’s no longer sold and you can’t replace it? 3D printing means you can simply print a new one. That world, where you can make almost anything at home, is very different from the one we live in today. In other words, it’s a world that doesn’t need trucks to deliver goods or warehouses to store them in.

It’s also a world where everyday items are made to measure, to your requirements. What I mean is, furniture is made to fit your home, shoes made to fit your feet, door handles made to fit your hand, meals printed to your tastes at the touch of a button.
I. It is much clearer now and as far as I understand it gives room for customizing most products.

Hellington: You are right Sheila.

Sheila: Can we continue with the areas in which 3d printing is used professor?

Hellington: Sure. One of the greatest things about 3D printing is that it can be beneficial for anyone, regardless of industry or profession. For example, it has changed the medical field a lot. One of the more immediate emerging trends is the use of 3D printing directly in hospitals. Up until a couple of years ago, there were only a few hospitals doing 3D printing directly in the hospital. Now, hospitals across the U.S and around the globe are setting up 3D printing labs within their complexes so that healthcare professionals can incorporate the process into a normal day’s work.

Sheila: This is great but can you please give more information about how 3D printing helps doctors exactly?

Hellington: The work primarily focuses on printing patient-specific models before surgery. A doctor can look at a patient’s specific anatomy and practice it on a customized 3D printed model prior to surgery. Doctors claim that they potentially have a better surgical outcome that way. They believe that with 3D printing, they will spend less time in the operating room, patients will spend less time under anesthesia, and fewer risk of infection.

Sheila. Well this sounds promising but I didn’t come across this information during my research.

Hellington: 3D printing will also hopefully customize medical implants. Thousands of 3D printed replacements for bony body parts: knees, hips, ankles, parts of the spine, and skull,3 are implanted every year, and the future holds more promise with 3D printed patient-specific parts.

Sheila. Professor do you think 3D printing may solve the problem of shortage of organs as well?

Hellington: Exactly! Although some trace the origins of tissue engineering back to the mid-1600s with the identification of cells, it’s often considered a young field as a modern scientific discipline since it began ramping up toward the end of the last century. While an entire organ has yet to be successfully printed for practical surgical use, scientists and researchers have successfully printed kidney cells, sheets of cardiac tissue that beat like a real heart and the foundations of a human liver, among many other organ tissues. While printing out an entire human organ for transplant may still be at least a decade away, medical researchers and scientists are well on their way to making this a reality in the future.
Sheila: This is a medical breakthrough actually but the medical field is not the only area which utilizes 3d printing. Am I right professor?

Hellington: Yes you are Sheila. Fashion designers and industry also make use of 3D printing in myriad of ways. 3D printing permits fashion designers to expand beyond the traditional boundaries of design, allowing them to turn some of the most challenging design concepts into reality.

Sheila: Can you give us some examples as to how it is done so that I can add it to my presentation?

Hellington: For example, you can create a specific textile that is waterproof and flexible. You can then combine these elements together and they can all be present in a single garment.

Sheila. This is very impressive and I didn’t know that professor! I will definitely use this example!

Hellington: Moreover, without the need for a specific mold, designers are free to create complex geometries and structures which are not only aesthetically pleasing, but can add smart functionality. For example, instead of using traditional buttons, we can create locking functionality directly into the textile itself. We’re still in the early stages of developing our understanding and working out what is feasible, but the possibilities are vast.

Sheila: Fashion industry can then benefit from this customization. Right?

Hellington: Yes you are right. The immense opportunities for customization that 3D printing offers are very significant for the industry. Apparels can now be created to perfectly fit the size of each part of the body, allowing for true personalization. This capability will also enable 3D printing to branch into other areas of fashion, such as leisure and sportswear.

Sheila. From what you told me it seems 3D printing offers so many different and functional alternatives but I also read that it is sometimes limited. Can you please touch upon this as well?

Hellington: Although 3D printing technology may help people in various ways, it has a dark side as well and is not always the right choice for product development for certain development projects. 3D machines may still be potentially hazardous and wasteful. Moreover, their economic, political, societal, and environmental impacts have not been extensively studied.

One of the negative impacts is related to high energy consumption. According to research by Loughborough University, 3D printers consume approximately 50 to 100 times more energy than injection molding, when melting plastic with heat or lasers. For mass production, 3D printers consume a lot of energy and are therefore better suited for small batch production runs.

I. One of the internet sources claims it is cost effective though?
Hellington: Not all the sources you find on the net are reliable. It is just the opposite actually. 3D Printing Technology is expensive. 3D printing equipment and materials cost make the technology expensive. Industrial grade 3D printers are still expensive costing hundreds of thousands of dollar, which makes the initial expenses of using the technology very high. For a single machine, capital investment starts in the tens of thousands of dollars, and can increase to as high as hundreds of thousands of dollars or more. Also, the materials used in commercial grade 3D printers are costly compared to product materials used in traditional manufacturing.

Sheila: I should make the necessary changes on my slide then but the most common material used in 3D printing is plastic. Isn’t it?

Hellington: You are right. While 3D printing is a significant manufacturing breakthrough, materials that can be used are still limited, and some are still under development. For example, the 3D printing material of choice is plastic. Plastic is preferred as it can quickly and easily be deposited down in melted layers to form the final product. In other words, as it easily melts the final version of the product is formed quickly. However, plastic may vary in strength capacity and may not be the best for some components. Some companies offer metal as a material, but final product parts are often not fully dense. Other specialized materials including glass and gold are being used but are yet to be commercialized.

Sheila: I understand. I am also confused whether 3D printers are user friendly or not because there are different views on that.

Hellington: 3D Printers aren’t easy to use actually. Because of the excitement and potential around 3D printing technology, 3D printers have come across as easy to use and also sound more useful than they really are. The truth is 3D printers use high-voltage power supplies, specialized equipment, and parts which makes them difficult to use and manage. Some have low resolution and can’t even connect to Wi-Fi.

Additionally, 3D printers lead to harmful emissions.

Sheila. How can they possibly pose risks for the environment?

Hellington: 3D printers used in enclosed places such as homes can generate potentially toxic emissions and carcinogenic particles according to researchers at the Illinois Institute of Technology. Their 2013 research study showed that 3D desktop computers could emit large numbers of ultrafine particles and some hazardous compounds during printing.

Generally speaking, anything involving plastic isn’t great news for the environment, and while researchers are working on creating biodegradable plastic polymers (the ‘ink’, if you will), the whole process still relies on a material that’s environmentally damaging to. Although using raw plastic reduces waste generation, the machines still leave unused or excess plastic in the print beds. The plastic byproduct ends up in landfills negatively affecting the environment. Furthermore, plastic limits the type of products that can be created from the material. Future 3D printers will need to use other materials such as metal (as some currently do) or carbon composites to become more useful to manufacturers and consumers alike.
Sheila: However, 3D printing is much faster when it comes to manufacturing objects. Am I right?

Hellington: On the contrary actually. While 3D printers are limitless for mass customization, they are slow in terms of manufacturing many objects. Depending on printer size and quality, it can take several hours to days to print. The more the work involved with product development, the slower the printers. Companies that receive orders to customize and make 3D prints using a variety of products can take up several weeks to print depending on the materials used.

Sheila: In light of what you said, 3D printing can be used to create many objects. What about the production of dangerous weaponry. Can 3D printers really be used to create weapons?

Hellington: Yes they can be. In fact, 3D printing makes the production of dangerous weaponry very easy. With 3D printers, it is easy to create 3D knives, guns, explosives, and any other dangerous items. Criminals and terrorists can, therefore, make such weapons without being detected. Some criminal organizations have already used 3D printing technology to create card readers for bank machines. As time goes on, 3D technology will become more user-friendly and cost-effective, and it is possible that design and production of unlicensed weaponry will increase.

Sheila: Not very good news! This may have some serious consequences.

Hellington: Not only creating weaponry but also counterfeiting is one of the most significant disadvantages of 3D printing. Anyone with a product blueprint can forge products very quickly. Patent violations will increasingly become more common, and identifying imitated items will become practically impossible.10

Sheila: Then this means as 3D printing technology evolves, patents, and copyright holders will have a harder time protecting their rights and companies manufacturing unique products will be adversely affected.

Hellington: This is unfortunately true. 3D printing technology can also make product designs and prototypes in a matter of hours as it uses only one single step. It eliminates a lot of stages that are used in traditional manufacturing. Because 3D printing doesn’t require a lot of man power, it may lead to a decrease in manufacturing jobs. This decline could dramatically affect the economy.

Sheila: It seems in a lot of industries, 3D printing provides countless benefits. However, it may not replace traditional manufacturing at least for now. Am I right?

Hellington: Exactly! It is still an emerging technology with some disadvantages that need to be considered when selecting a product development method. Manufacturers and product designers therefore need to see it as complementary production system. They can exploit its unique capabilities to improve product design and manufacture entirely new products that could not be otherwise produced.
I. Thank you very much for professor Hellington. I will make the necessary modifications on my presentation in light of the information you gave me.

Hellington: My pleasure. You can come and ask your questions any time.

Sheila: Thanks a lot professor.
1. Why is it difficult to define complementary and alternative medicine specifically?

It refers to a broad domain of healing resources that encompasses all health systems, modalities, and practices.

2. Write two categories of alternative medical systems.

a. ______ ayurveda / homeopathy _______

b. ______ naturopathy/traditional Chinese medicine_______

3. Why is Ginkgo biloba good for?

It is used to treat mild cognitive impairment/ Alzheimer’s or dementia

4. Why is chiropractic treatment practiced on patients?

____ it is practiced for spinal adjustment and to correct spinal joint abnormalities. ______

5. What is the aim of energy therapies?

___ The goal of this therapy is specifically to unblock or re-balance your energy force/manipulate and apply energy fields into your body____.

6. According to Buddhism, illnesses emerge because ___ human morality and natural environment are out of balance ______

7. Ayurveda is a system of medicine that ___ that keeps a person’s body, mind and spirit in balance with nature ___________ in order to maintain good health.

8. Write two possible benefits of CAM therapies.

a. ______ it can alleviate some of the symptoms of cancer, as well as lessen the negative side effects of conventional medical treatments._______

b. ___less expensive/ may contribute to the overall well being of patients _____

9. Write one disadvantage of using dietary supplements.

____may cause liver damage in some patients. Some studies show that high doses of vitamins, even vitamin C, may affect how chemotherapy and radiation work.

10. Many complementary and alternative therapies still had not been conducted in clinical trials on human patients because ___CAM did not attract significant investment from governments and biomedical companies/Cam seen as inferior ____

11. What should patients considering undergoing CAM therapy be cautious of?

____patients need to be very cautious and aware of its implications before they decide to undergo this type of treatment
Good morning, I am Lorraine Miller. I have been an internal disease specialist for 12 years and a complementary and alternative medicine practitioner for four years. Today, I would like to start my talk by giving you a brief definition of CAM, the shortened version for complementary and alternative medicine. Then I would like to move on and discuss different categories of CAM. Next, I will talk about a brief history of CAM and finally I will mention its possible benefits and risks.

So let me start by explaining complementary and alternative medicine. I will be referring to complementary and alternative medicine as CAM as it is much easier this way. CAM intends to improve or maintain human health that is not part of standard medical care. Standard medical care is practiced by health professionals who hold an M.D. (medical doctor) or D.O. (doctor of osteopathy) degree. It is also practiced by other health professionals, such as physical therapists, physician assistants, psychologists, and registered nurses. Standard medicine may also be called biomedicine or Western or regular medicine. CAM on the other hand is the popular term for health and wellness therapies that have typically not been part of conventional Western medicine. Complementary means treatments that are used along with conventional medicine. Alternative means treatments used in place of conventional medicine. However, it is difficult to come up with an exact definition of CAM because it refers to a broad domain of healing resources that encompasses all health systems and practices. What I mean is, it entails so many various practices and healing systems that it is difficult to define it in a single sentence. In this respect, CAM includes not only classical systems, such as traditional Chinese medicine, but also a wide variety of other forms of therapy which I will elaborate later on in my speech.

The next area I would like to focus on is different types of complementary and alternative medicine. National Center for Complementary and Integrative Health divides CAM practices into five categories. The first one is alternative medical systems; the next one is mind-body interventions, the third one is biologically based treatments. The fourth category is manipulative and body-based methods, and the last one is energy therapies.

The first category I would like to elaborate on is alternative medical systems. As the name implies, it is a broad category that extends beyond a single modality. Let me clarify what I mean. It refers to an entire system of theory and practice that developed separately from conventional medicine. Examples of these approaches include: ancient healing systems. These healing systems arose long before conventional Western medicine and include ayurveda as you said from India and traditional Chinese medicine. Another one is called homeopathy. This approach uses very small doses of a drug that cause symptoms to stimulate the body's self-healing response. The other one is naturopathy. This approach however focuses on noninvasive treatments to help your body do its own healing and uses a variety of practices, such as massage, acupuncture, herbal remedies, exercise and lifestyle counseling.
The second category mind-body interventions include practices that are based on the human mind, but that have an effect on the human body and physical health, such as meditation, prayer, and mental healing.

The third category, on the other hand, biologically based therapies, includes specialized diets, herbal products, and other natural products such as minerals and hormones. Specialized diets include those as well as the broader field of functional foods that may reduce the risk of disease or promote health. A few of the well-known herbals for which there is evidence of effectiveness include Ginkgo biloba. Let me spell that for you. G_I_N_K_G_O  B_I_L_O_B_A Ginkgo biloba is used to treat mild cognitive impairment. Let me clarify what I mean for you. A person with MCI is at an increased risk of developing Alzheimer’s or another dementia. Additionally fish oil is an example of a non herbal natural product and used for the treatment of cardiovascular conditions.

The fourth category, manipulative and body-based methods, includes therapies that involve movement of the body. For example, chiropractic, let me spell that for you.. C-H-I-R-O-P-A-C-T-I-C is the best known in this category, and chiropractors are licensed to practice in every U.S. state. A defining feature of chiropractic treatment is spinal manipulation. Chiropractors use hands-on techniques to properly align a person’s spine to correct abnormalities of the skeletal structure. Chiropractors believe this type of treatment can enable the body to heal itself without surgery or medication.

The final category described by National Center for Complementary and Integrative Health is energy therapies. Energy therapies include qi gong, healing touch and reiki. They are practiced to manipulate and apply energy fields to the body. In addition to electromagnetic fields outside of the body, it is hypothesized that energy fields exist within the body. Some CAM practitioners believe an invisible energy force flows through your body, and when this energy flow is blocked or unbalanced, you can become sick. Different traditions call this energy by different names, such as chi, prana and life force. The goal of this therapy is specifically to unblock or re-balance your energy force.

Now, let’s turn to history of CAM to comprehend it better. The history of alternative medicine is an interesting one and has links with many different cultures. However, it’s difficult to say exactly when alternative Medicine began, in part because up until recently the practices that fall under this term were the conventional medical practices of their time. But if we go back in history and trace several of the forms of healing that are now labeled as alternative, we find that their origins go back as much as 6000 years.

One of the oldest forms of alternative medicine can be traced back through Indian history.. Ayurvedic medicine dates back as far as 6000 years ago and also has links with Buddhism. Ayurveda comes from 2 Sanskrit words – Ayu meaning life and Veda meaning knowledge of. It is a system of medicine that may help people align their minds, bodies and spirits with nature so that they can be healthy. That is, ayurveda may keep a person’s body, mind and spirit in balance with nature in order to maintain good health.

The other Eastern Culture that has a long history of alternative medicine is China. The ancient Chinese, in much the same way as alternative medicine, is used today, based their healing on the importance of the body and spirit being in balance. Much of the philosophy of
Chinese Medicine is based on Taoist and Buddhist principals and the belief that a person and their environment are closely interlinked. That is, Buddhism believes there is a close relationship between human morality and the natural environment. Let me explain what I mean. According to Buddhist principle, not only should people keep their relationship with other human beings very gentle and non-violent, but it is also very important to extend that kind of attitude to the natural environment. When this balance between human beings and nature is disturbed, disease occurs. According to this belief, if this mutual balance between human beings and nature deteriorates, so will humans’ health. Chinese medicine works at restoring this balance in various ways including herbal medicine, acupuncture, breathing and movement (Tai Chi and Qigong) and also through diet. In the past, the practitioner looked at the patient’s health and life in detail to ascertain where their life force or Qi (pronounced Chi) was out of balance. Various methods would then be used to restore the patient back to health. Such was the effectiveness of Chinese Traditional Medicine that it still forms a large part of modern health care in the East. It’s not unusual for these alternative practices to be used in hospitals alongside western medicine.

In the West, however, the History of Alternative Medicine goes back around 3000 years. Treatments such as hydrotherapy were particularly popular with the Romans and Greeks. Hydrotherapy involves the use of water for pain relief and treatment. The term encompasses a broad range of approaches and therapeutic methods that take advantage of the physical properties of water to stimulate blood circulation and treat the symptoms of certain diseases.

In addition to hydrotherapy, after Europeans settled in America they found that the Native Americans had an extensive knowledge of the healing power of their indigenous herbs. Likewise, the Aborigines in Australia understood the power of plants found in their environment. Moving forward in time towards the 19th Century, before the rise of Western Medicine, medical practitioners were more like today’s naturopaths. They would take a detailed medical history paying particular attention to the patient’s lifestyle. They would then suggest ways to improve this by changes in diet, environment and would also prescribe herbal remedies.

I’d like now to recap to ensure we are all on the same page. I have talked about what CAM is, explained different types of it and touched upon its history. Having discussed these, I think you now have a good idea regarding what it is. Now I would like to move on and look at mainly three possible benefits of CAM therapies.

The first benefit of alternative medicine therapies used together with conventional medical treatments is, it can alleviate some of the symptoms of cancer, as well as lessen the negative side effects of conventional medical treatments. For example, chemotherapy, although effective in increasing the survival rate of many cancer patients, can produce unpleasant side effects. Some cancer patients are able to tolerate chemotherapy treatments better when using an alternative treatment such as acupuncture to control side effects like fatigue, headache, nausea, vomiting, night sweats and aching.

The second spin off is related to its cost. Alternative medicine therapies can be less expensive than conventional medical treatments. Although some alternative therapies are not cheap, many herbal remedies and other natural treatments still cost less than prescribed
medications and treatments. For instance, acupuncture and chiropractic sessions can cost significantly less than conventional pain therapy treatments.

Alternative medicine can also be beneficial to a person’s mental and physical health. As the approach focuses on healing the mind, body and spirit, it may contribute to the overall well being of patients. Treatment methods such as massage therapy, biofeedback, meditation and visual imagery help a person to relax and reduce stress. Art and music therapies are used to relieve symptoms of depression and schizophrenia by stimulating the natural release of endorphins and opiates in the body, in addition to helping individuals let go of deeply repressed emotions. The Substance Abuse and Mental Health Services Administration points out that other alternative approaches to mental health, such as diet and nutrition, animal-assisted therapies and self-help groups can be valuable resources for improving mental health.

The last area I would like to focus on is the possible risks of CAM practices. There are three main risks of employing CAM practices. Firstly, some doctors are reluctant to practice CAM due to the protection of their patients. Despite the ideology of a safe, “natural” approach to health care frequently espoused by CAM therapists, the approaches used in CAM pose certain hazards to users. For example, the patient may have punctured lungs in the case of acupuncture. Let me explain what I mean.. A punctured lung occurs when air collects in the space between the two layers of the tissue lining the patient’s lung and acupuncture may lead to it very easily if the CAM practitioner doesn’t know how to practice it well.

Secondly, CAM therapies include a wide variety of botanicals and nutritional products, such as dietary supplements, herbal supplements, and vitamins. Many of these "natural" products are considered to be safe because they are present in, or produced by, nature. However, that is not true in all cases. Herbal supplements may also be harmful when taken by themselves, with other substances, or in large doses. For example, some studies have shown that kava kava, an herb that has been used to help with stress and anxiety, may cause liver damage in some patients. Additionally, vitamins can have unwanted effects in people’s bodies. For example, some studies show that high doses of vitamins, even vitamin C, may affect how chemotherapy and radiation work. Too much of any vitamin is not safe, even in a healthy person.

Furthermore, there are also major gaps in the evidence that has been provided for such therapies. By the late 20th century many complementary and alternative therapies still had not been explored in clinical trials in human patients, unlike most drugs and devices employed in conventional medicine. That was largely because manufactured pharmaceuticals and other medical products were thought to be superior to complementary and alternative therapies, and so the latter did not attract significant investment from governments and biomedical companies. In the early 21st century, however, an increased need for medicines generally resulted in renewed interest in natural-products drug discovery which in turn led to a rise in the clinical exploration of various CAM therapies. In addition, some CAM practitioners make exaggerated claims about curing diseases, and some ask you to forgo treatment from your conventional doctor. For these reasons, many doctors are cautious about recommending these therapies. CAM therapies need to be evaluated with the same long and careful research process used to evaluate standard treatments.
In conclusion, we cannot turn a blind eye on CAM but patients need to be very cautious and aware of its implications before they decide to undergo this type of treatment. Plus, CAM practitioners should be required to receive diplomas before they are allowed to employ it on people. We also need more evidence regarding its efficiency but at the moment the National Center for Complementary and Integrative Health (NCCIH) are currently sponsoring various clinical trials that test CAM treatments and therapies in people. This means we will be able to learn about its impact on patients in the near future. Thank you for listening.

Readability Scores

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*Indication of the number of years of formal education that a person requires in order to easily understand the text on the first reading*

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## Reading 1 Stem Cells

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<td>21</td>
<td>b) The exact reason why some are against stem cell research</td>
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<td>3</td>
<td>c) Initial successes in the stem cell research</td>
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<td>12</td>
<td>d) Two issues whose resolution may give rise to stem cell therapy</td>
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<td>6</td>
<td>e) Stem cell research as an aid to scientific development</td>
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<td>f) What needs to be done for a successful stem cell replacement therapy</td>
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<td>13</td>
<td>g) Controversy about adult stem cells’ ability to turn into different tissue cells</td>
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<td>h) Reasons why stem cells are vital for living things</td>
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<td>29</td>
<td>i) Successes in transforming cells without genetic modification</td>
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1. People also take issue with the creation of chimeras. A chimera is an organism that has both human and animal cells or tissues. Often in stem cell research, human cells are inserted into animals like mice or rats and allowed to develop. This creates the opportunity for researchers to see what happens when stem cells are implanted. Many people, however, object to the creation of an organism that is only "part human" on ethical grounds.
2. The stem cell debate has risen to the highest level of courts in several countries. Production of embryonic stem cell lines is illegal in Austria, Denmark, France, Germany, and Ireland, but permitted in Finland, Greece, the Netherlands, Sweden, and the UK. In the United States, it is not illegal to work with or create embryonic stem cell lines. However, the debate in the US is about funding, and it is in fact illegal for federal funds to be used to research stem cell lines that were created after August 2001.

3. To summarize, stem cells offer exciting promise for future therapies, but significant technical hurdles remain that will only be overcome through years of intensive research. There are also ethical and legal barriers that will need to be negotiated before stem cell research is carried out further.

https://www.medicalnewstoday.com/info/stem_cell
https://stemcells.nih.gov/info/basics/1.htm
**Task 1:** Read **Text 1** and answer questions 1-5.

1. What was the effect of loss of a unified state?

   ___ the network of trade and commerce collapsed and the European World was set into chaos. The Catholic Church became the most powerful institution of the medieval period ________

2. People believed plague was caused by ___ the crisis in God’s anger, human sin, and outsider or marginal groups, especially Jews (1/2). ________ since they didn’t exactly know why it occurred.

3. What did the Crusaders believe their rewards would be?

   ___ their service would guarantee the forgiveness of their sins and ensure that they could spend all eternity in Heaven ________

4. What was the impact of the barbarian invasion and the evolution of feudal system on Europe?

   ___ various innovative steps in architecture of the Middle Ages ___________________

5. How did the architectural style change as a result of changing influences of Church and feudalism?

   ___ architectural styles of Middle Ages gradually changed from Romanesque architecture to Gothic architecture _____

**Task 2:** Read **Text 2** and answer questions 6-10.

6. What was the impact of expansion of trade routes by Crusades?

   ___ the Crusades had expanded trade routes to the East and given Europeans a taste for imported goods such as wine, olive oil and luxurious textiles _____________________

7. What led to the emergence of humanism?

   ___ Renaissance thinkers on the other hand, emphasized people’s responsibilities and duties to the society in which they lived. They believe that society could civilize people rather than make them wicked __________

8. Why did the rising middle class buy artwork for their houses?

   ___ imitate the aristocracy and elevate their own status by purchasing art for their homes ______

9. What social effect did the invention of the printing press have?

   ___ This meant that people who were previously illiterate now had the motivation to learn how to read, which lead to a more educated and inquisitive population _____________________
10. Before Renaissance people were more oriented towards religious thinking but after Renaissance they became more interested in understanding people and the world.

_____ /5

Total: _____ /10

Text 3:

1. unified force/unifying factor

2. deepest recession/emerging shortage of agricultural products/recession

3. port cities

4. people’s responsibilities

5. commissioned by

6. surpassed