BT605 – BIOSAFETY & BIOETHICS

MID TERM MOST IMPORTANT QUESTIONS

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GROUP LINK: https://chat.whatsapp.com/BjC6W0jZx8o9yaC2ISh1Gu

1. Write three principles of bioethics?

Three core principles of bioethics are:

1. ***Autonomy:*** Respecting a person's right to make their own decisions regarding their body and healthcare. This includes informed consent and honoring patients' choices.
2. ***Beneficence:*** Acting in the best interest of the patient by promoting their well-being and providing beneficial care while minimizing harm.
3. ***Justice:*** Ensuring fairness in the distribution of healthcare resources, access to medical treatments, and the equitable treatment of patients regardless of their background or status.

2. What are cybernetic ethical issues?

Cybernetic ethical issues arise from the integration of cybernetic systems—like AI, robotics, and human-machine interfaces—into human life. These systems can impact autonomy, identity, responsibility, and social structures. Key ethical issues include:

1. ***Autonomy and Control:*** When machines make decisions or augment human functions (e.g., neural implants), questions arise about who is truly in control and whether human autonomy is compromised.
2. ***Privacy and Surveillance:*** Cybernetic systems often collect and process large amounts of data. Ethical concerns focus on how this data is used, who has access, and the potential for surveillance or misuse.
3. ***Responsibility and Accountability:*** As decision-making becomes more automated, it's harder to determine who is responsible when something goes wrong—whether it's the programmer, the user, or the system itself.
4. ***Human Identity and Enhancement:*** Technologies like brain-computer interfaces and prosthetics challenge traditional views of what it means to be human. Ethical questions arise around fairness, authenticity, and the potential for coercive enhancement.
5. ***Inequality and Access:*** Advanced cybernetic technologies may be available only to the wealthy, increasing social inequality and creating ethical concerns about access and fairness.

3. Why we use animals in biotechnology?

Animals are used in biotechnology for several important reasons, primarily due to their biological similarity to humans and their role in advancing scientific and medical knowledge. Here are the main reasons:

1. ***Biomedical Research and Drug Testing:*** Animals are used to study disease mechanisms and test the safety and efficacy of new drugs before human trials. This helps researchers understand how a treatment might work in humans.
2. ***Genetic Engineering:*** Animals can be genetically modified to produce proteins, hormones, or antibodies that are used in medicine. For example, transgenic goats can produce human insulin in their milk.
3. ***Xenotransplantation Research:*** Pigs and other animals are studied as potential sources of organs for human transplants. Biotechnology helps reduce immune rejection by modifying animal genes.
4. ***Model Organisms:*** Animals like mice, rats, and zebrafish are used as model organisms to study human genes, development, and diseases because they share many genetic similarities with humans.
5. ***Production of Biopharmaceuticals:*** Animals can be used as bioreactors to produce complex drugs (like clotting factors or vaccines) that are difficult to synthesize in labs.
6. ***Agricultural Improvements:*** Biotechnology uses animals to improve livestock health, increase growth rates, and enhance resistance to diseases, which benefits food production and security.

4. Mention factors that affect the production of atmospheric CO2.

Several factors affect the production of atmospheric CO_2**,** both natural and human-induced. Here are the main ones:

- ***Fossil Fuel Combustion:*** Burning coal, oil, and natural gas for electricity, transportation, and industry is the largest human source of CO_2 emissions.
- ***Deforestation and Land Use Changes:*** Cutting down forests reduces the number of trees that can absorb CO_2 through photosynthesis, and the process of deforestation often involves burning, which releases stored carbon.
- ***Industrial Processes:*** Cement production, steel manufacturing, and other industrial activities release CO_2 as a byproduct of chemical reactions and energy use.
- ***Agricultural Practices:*** Soil disturbance from plowing, livestock respiration, and burning of agricultural waste can increase CO_2 emissions.
- ***Natural Processes:*** Volcanic eruptions, wildfires, and natural decay of organic matter release CO_2 into the atmosphere.
- ***Ocean-Atmosphere Exchange:*** Oceans both absorb and release CO_2. Changes in sea temperature and currents can affect how much CO_2 the ocean stores or emits.
- ***Population Growth and Urbanization:*** More people means increased demand for energy, transportation, food, and materials—all of which contribute to CO_2 production.
- ***Technological and Energy Choices:*** The type of energy sources used (renewable vs. fossil fuels), energy efficiency, and transportation systems directly impact CO_2 emissions.

5. Write uses of animal fur in biotechnology.

In biotechnology, animal fur has limited but specialized uses. While it is not as commonly used as tissues, cells, or genetic material, it can still serve important purposes in certain areas:

1. Genetic and Molecular Research

DNA Extraction: Fur can be a non-invasive source of DNA for genetic studies, especially in wildlife research and conservation biology.

Species Identification: Biotechnology techniques use fur samples for DNA barcoding to identify species, track genetic diversity, and monitor illegal wildlife trade.

2. Forensic Biotechnology

Fur is used in forensic investigations to identify animal species involved in crimes or accidents, using techniques like PCR (Polymerase Chain Reaction).

Helps in poaching investigations and determining the origin of fur in the fashion industry.

3. Transgenic Animal Studies

In genetically modified animals, changes in fur color or texture can be **visible markers** to confirm successful gene expression (e.g., in transgenic mice).

4. Biomaterial Development

Research is exploring the keratin in animal fur for use in biodegradable materials, nanofibers, and wound-healing products, due to its strength and biocompatibility.

5. Environmental Monitoring

Fur can absorb environmental contaminants like heavy metals or pollutants, making it useful in biomonitoring and environmental biotechnology studies.

6. How mentally unstable patient deals with patient-physician relationship? Give example.

A mentally unstable patient may experience challenges in the patient-physician relationship due to cognitive, emotional, or behavioral symptoms associated with their condition. These challenges can affect trust, communication, compliance with treatment, and perception of care.

- ***Trust Issues:*** Patients with paranoia, schizophrenia, or severe anxiety may have difficulty trusting the physician, believing the doctor intends to harm them or doesn't understand them.
- ***Impaired Communication:*** Conditions like bipolar disorder (during manic or depressive episodes) or psychosis can make it hard for patients to express themselves clearly or understand medical advice.
- ***Poor Treatment Adherence:*** A patient may not follow prescribed treatments due to delusions, memory issues, or disbelief in the diagnosis.
- ***Emotional Instability:*** Patients may show intense emotions, such as anger or fear, which can complicate calm, constructive medical interactions.

Example:

A patient with schizophrenia

John, a 28-year-old man diagnosed with schizophrenia, believes that doctors are government agents trying to

control his mind. During his appointments, he becomes defensive, refuses medication, and avoids eye contact.

Physician's Role:

The psychiatrist builds a relationship slowly, using consistent, non-confrontational language. Instead of challenging John's beliefs directly, the doctor focuses on symptoms John wants relief from (e.g., sleeplessness). With time, trust develops, and John becomes more open to treatment, including medication and therapy.

7. What are effects of cloning on animals?

Cloning can have several negative and positive effects on animals, particularly when it involves reproductive cloning (creating a genetically identical copy of an animal). The process is complex and often associated with health risks, ethical concerns, and biological limitations.

Negative Effects of Cloning on Animals

- ***High Failure Rates:*** Many cloning attempts fail during early embryonic stages. Success rates are typically very low (often below 10%).
- ***Birth Defects and Abnormalities:*** Cloned animals often suffer from large offspring syndrome, heart defects, lung problems, or kidney dysfunction.
- ***Shortened Lifespan:*** Some clones, like Dolly the sheep, have shown signs of premature aging, possibly due to shortened telomeres.
- ***Immune System Problems:*** Clones may have underdeveloped or malfunctioning immune systems, making them vulnerable to infections.
- ***Poor Health and Suffering:*** Cloned animals are more likely to suffer from chronic health conditions and require intensive veterinary care.
- ***Welfare Concerns:*** The process often involves multiple animals (egg donors, surrogates, and the clones), raising concerns about pain, stress, and ethical treatment.

Potential Positive Effects

- ***Preservation of Endangered Species:*** Cloning could help restore or preserve species at risk of extinction, though it doesn't solve habitat or biodiversity issues.
- ***Agricultural Advancements:*** Cloning of livestock can reproduce animals with desirable traits (e.g., high milk production), improving food quality and supply.
- ***Biomedical Research:*** Cloned animals are used to study genetic diseases and test new treatments, offering insights into human and animal health.
- ***Therapeutic Cloning:*** In the future, cloning may aid in generating tissues or organs for transplantation, although this is more related to cell cloning than whole-animal cloning.

8. What are responsibilities of patient towards physician?

Patients have important responsibilities toward their physicians that help ensure effective, respectful, and collaborative healthcare. These responsibilities contribute to better diagnosis, treatment, and overall patient outcomes.

Key Responsibilities of a Patient Toward Their Physician:

- ***Honesty and Transparency:*** Patients should provide accurate and complete information about their symptoms, medical history, medications, lifestyle, and other relevant factors.
- ***Compliance with Treatment:*** Patients are expected to follow the physician's recommendations, including taking medications as prescribed, attending follow-up appointments, and following lifestyle advice.
- ***Respect and Courtesy:*** Patients should treat the physician and medical staff with respect and professionalism, just as they expect to be treated.
- ***Ask Questions and Communicate Concerns:*** Patients should actively participate in their care by asking questions, seeking clarification, and expressing concerns about their treatment plan.
- ***Keep Appointments and Be Punctual:*** Attending scheduled appointments and arriving on time shows respect for the physician's time and helps ensure timely care.
- ***Informed Decision-Making:*** Patients should take responsibility for understanding their treatment options and give informed consent when necessary.
- ***Provide Feedback:*** Constructive feedback can help physicians improve care, while reporting side effects or complications is essential for treatment adjustments.
- ***Maintain Health Practices:*** Patients are responsible for making efforts to live a healthy lifestyle (e.g., diet, exercise, avoiding harmful habits) to support their treatment.

9. What are ethical issues in cloning?

Ethical issues in cloning involve concerns about identity, human dignity, animal welfare, and the broader impact on society and nature. These include:

- ***Loss of Individuality and Identity:*** Cloning creates genetically identical beings, raising questions about the uniqueness and individuality of the clone.
- ***Consent and Autonomy:*** Clones, especially human clones, cannot consent to being created. This raises moral concerns about autonomy and rights from birth.
- ***Potential for Exploitation:*** Clones might be treated as mere tools—for spare organs, research, or labor—rather than as beings with rights.
- ***Health Risks and Harm:*** High failure rates, birth defects, and health issues in cloned animals suggest a risk of suffering, which is considered unethical.
- ***Parent-Child Relationship Confusion:*** In human cloning, family roles may become psychologically and socially confusing, affecting identity and emotional development.
- ***Playing God Argument:*** Some believe cloning interferes with natural processes or divine will, questioning the moral authority of humans to create life artificially.
- ***Social Inequality:*** Access to cloning technologies may be limited to the wealthy, increasing social inequality and the potential for genetic "class divides."
- ***Animal Welfare:*** Cloning animals for food, research, or preservation often involves pain, distress, and high mortality rates, leading to ethical concerns about their treatment.
- ***Genetic Determinism:*** Cloning could encourage the belief that genetics alone define identity, ignoring the role of environment, experience, and free will.

10. What ethical issues encounter in genetic screening?

Genetic screening raises several ethical issues related to privacy, consent, discrimination, and the potential consequences for individuals and their families. These include:

- ***Informed Consent:*** Ensuring that individuals fully understand the potential risks, benefits, and limitations of genetic testing is crucial. Inadequate information or pressure to undergo screening can lead to ethical concerns about autonomy.
- ***Privacy and Confidentiality:*** Genetic information is highly personal, and there are concerns about how this data is stored, shared, and protected from unauthorized access, particularly in the context of medical records and insurance companies.
- ***Genetic Discrimination:*** Individuals might face discrimination from employers, insurers, or others based on the results of genetic screening, leading to the potential for unequal treatment or denial of benefits.
- ***Psychological Impact:*** Learning about predispositions to certain genetic conditions can cause significant psychological distress, anxiety, or even a sense of fatalism for individuals, as well as for their families.
- ***Family Implications:*** Genetic screening can uncover information about the health risks of family members, raising concerns about how this information is shared and whether it could lead to tension or conflict within families.
- ***Access and Equity:*** There are concerns about unequal access to genetic screening, especially in underserved communities, which could lead to disparities in healthcare and outcomes.
- ***Prenatal and Pre-implantation Testing:*** The use of genetic testing during pregnancy or in embryos (such as to detect disorders like Down syndrome or cystic fibrosis) raises ethical questions about selective abortion and the potential for "designer babies."
- ***Potential for Misuse:*** Genetic screening could be misused for non-medical purposes, such as selecting traits or manipulating genetic outcomes, creating ethical dilemmas regarding the natural diversity of human beings.
- ***False Positives and Negatives:*** Genetic tests are not always definitive, and false positives or negatives could lead to incorrect medical decisions, unnecessary treatments, or failure to detect serious health risks.
- ***Impact on Reproductive Choices:*** The information gained from genetic screening can influence reproductive decisions, such as whether to have children or choose certain methods of conception, raising ethical concerns about how to balance individual autonomy with societal values.

11. Discuss the value of environment in decision making?

The environment significantly influences decision-making through various factors:

- ***Social and Cultural Influences:*** Social norms and cultural values guide personal and collective decisions.
- ***Economic Environment:*** Financial constraints or opportunities shape choices based on available resources.
- ***Political and Legal Context:*** Government policies and laws impact decisions, especially in business or governance.
- ***Natural Environment:*** Environmental conditions (e.g., climate, resources) affect decisions in agriculture, construction, and personal choices.

- ***Technological Environment:*** Advances in technology force decisions to adapt to innovations or maintain competitiveness.
- ***Psychological and Emotional Factors:*** Mental state and peer influence can sway individual decision-making.
- ***Environmental Sustainability:*** Growing concerns over sustainability encourage eco-friendly and ethical decision-making.

12. Write role of cloning in human welfare?

Cloning plays several roles in human welfare, particularly in medicine, agriculture, and research. Some of its key contributions include:

- ***Medical Advancements:*** Therapeutic cloning could help create tissues or organs for transplant, reducing organ shortages and rejection issues. It can also be used to treat diseases like Parkinson's by regenerating damaged cells.
- ***Genetic Research:*** Cloning allows scientists to study genetic diseases by creating genetically identical animals, aiding in the development of new treatments or cures for human conditions.
- ***Reproductive Medicine:*** In cases of infertility, cloning techniques might offer alternative methods of reproduction, such as in vitro fertilization or potential reproductive cloning (though ethically controversial).
- ***Conservation of Endangered Species:*** Cloning endangered animals could help preserve species at risk of extinction by creating genetically identical individuals, although it doesn't address habitat loss or broader conservation issues.
- ***Agricultural Benefits:*** Cloning can produce animals with desirable traits (e.g., high milk yield or disease resistance), improving food security and the quality of agricultural products.

13. What are advantages of designer babies?

The concept of designer babies—where genetic manipulation or screening is used to select or enhance traits in embryos—raises both excitement and concern. However, some potential advantages include:

- ***Prevention of Genetic Diseases:*** Designer babies could be created to eliminate inheritable genetic disorders, like cystic fibrosis or sickle cell anemia, ensuring healthier offspring.
- ***Improved Health and Longevity:*** Genetic enhancements might increase resistance to diseases, reduce the risk of chronic conditions (e.g., heart disease), and potentially increase lifespan.
- ***Better Physical and Cognitive Traits:*** Parents might select embryos with desirable traits such as enhanced intelligence, athletic ability, or physical characteristics, improving quality of life and potential career opportunities.
- ***Increased Fertility Treatment Success:*** The use of genetic screening and manipulation could improve the success rates of in vitro fertilization (IVF), helping couples with infertility have healthier children.
- ***Personalized Medicine:*** Through genetic modifications, babies could be born with genetic profiles that are better suited to personalized medical treatments, reducing adverse reactions to medications.

14. What is risk assessment in biotechnology?

Risk assessment in biotechnology is the process of evaluating potential hazards and assessing the risks associated with biotechnological activities, products, or processes. It aims to identify, analyze, and manage the risks to human health, the environment, and society that might arise from the use of biotechnological innovations.

Key Components of Risk Assessment:

- ***Hazard Identification:*** Identifying potential biological, chemical, or physical hazards associated with a biotechnological product or process (e.g., genetically modified organisms, pathogens, or toxic chemicals).
- ***Risk Analysis:*** Assessing the likelihood of harm occurring and the severity of its consequences. This includes analyzing how likely a specific hazard is to cause an adverse effect and understanding the potential impact.
- ***Exposure Assessment:*** Evaluating how, when, and where individuals or the environment might be exposed to a specific risk, such as during the production, handling, or disposal of biotechnological materials.
- ***Risk Characterization:*** Combining the results from hazard identification, risk analysis, and exposure assessment to describe the overall risk and its potential impact on human health, the environment, and ecosystems.
- ***Risk Management:*** Developing strategies to control, reduce, or eliminate identified risks. This may include implementing safety protocols, regulatory oversight, containment strategies, and environmental monitoring.

15. What is ethical decision?

An ethical decision is a choice made based on moral principles such as fairness, integrity, and respect for others. It involves evaluating a situation by considering what is right and just, rather than merely pursuing personal interests. Ethical decision-making requires individuals to weigh the potential consequences of their actions, ensuring they do not harm others or the greater good. It also includes respecting the rights and dignity of others, being transparent in the decision-making process, and holding oneself accountable for the outcomes. Ethical decisions are consistent with established values and principles and are made with the intention of fostering fairness, trust, and respect in society.

16. Explain relationship of physician with mental patient.

The relationship between a physician and a mental health patient is built on trust, empathy, and professionalism, but it can be more complex due to the nature of mental health conditions. Physicians must approach the relationship with sensitivity, understanding, and respect, recognizing that mental health patients may experience challenges in communication, trust, and perception. Key elements of this relationship include active listening and non-judgmental support, where the physician works to understand the patient's symptoms and experiences without dismissing or stigmatizing them. The physician must also foster a safe environment where the patient feels comfortable sharing personal, sometimes distressing, information. In cases of severe mental illness, such as schizophrenia or bipolar disorder, the physician may need to be more proactive in guiding the patient's care, making treatment recommendations, and addressing issues like medication adherence. Additionally, the physician must respect the patient's autonomy, balancing the need for treatment

with the patient's right to make informed decisions about their care, while being mindful of any cognitive or emotional impairments that might affect their judgment.

17. What are responsibilities of physician towards patient?

Physicians have several key responsibilities toward their patients, including:

- ***Providing Competent Care:*** Physicians must offer the highest standard of care, based on medical knowledge, skills, and up-to-date practices.
- ***Informed Consent:*** They must ensure patients understand their diagnosis, treatment options, and potential risks before proceeding with any medical interventions.
- ***Confidentiality:*** Physicians must protect patient privacy, keeping medical information confidential unless required by law or with patient consent.
- ***Respect and Dignity:*** Physicians should treat patients with respect, empathy, and without discrimination, ensuring a safe and supportive environment.
- ***Honesty and Transparency:*** They must communicate openly, providing clear explanations about the patient's condition, treatment options, and prognosis.
- ***Patient Advocacy:*** Physicians are responsible for advocating for the patient's best interests, including helping them navigate the healthcare system and make informed decisions.
- ***Ongoing Education:*** Physicians must stay informed about the latest medical advancements and continue their education to provide the best care possible.

18. What are types of bad news?

Bad news can be categorized into several types, depending on the context and the impact it has on the individual receiving it. Some common types include:

- ***Medical Bad News:*** This includes diagnoses of serious or terminal illnesses, unfavorable treatment results, or a lack of improvement in the patient's condition.
- ***Personal Bad News:*** This can involve situations such as the loss of a loved one, relationship breakdowns, or personal failures that significantly impact an individual's emotional well-being.
- ***Financial Bad News:*** Examples include losing a job, bankruptcy, financial loss, or economic hardship, which can cause stress and anxiety.
- ***Legal Bad News:*** This involves legal issues such as lawsuits, criminal charges, or unfavorable legal decisions, which may affect a person's freedom or financial stability.
- ***Workplace Bad News:*** This may include issues like job termination, poor performance reviews, demotions, or organizational changes that impact job security.
- ***Social or Community Bad News:*** Bad news in this category can involve community tragedies, political instability, or societal shifts that create uncertainty or fear.

19. Enlist moral disputes.

Moral disputes arise when individuals or groups disagree on ethical principles or values. Some common moral disputes include:

- ***Abortion:*** Whether abortion is morally acceptable or not, especially regarding the rights of the mother versus the fetus.
- ***Euthanasia:*** The morality of ending a life to alleviate suffering, particularly in cases of terminal illness or when an individual is in a vegetative state.
- ***Animal Rights:*** Disagreements about the treatment of animals, including the ethics of factory farming, animal testing, and the use of animals for entertainment.
- ***Capital Punishment:*** Whether the death penalty is a justifiable punishment for certain crimes, given its potential for wrongful convictions and ethical concerns about the right to life.
- ***Environmental Ethics:*** The morality of human actions that affect the environment, such as climate change, deforestation, and pollution.
- ***Genetic Engineering:*** Ethical concerns surrounding the modification of organisms, including humans (designer babies), animals, and plants for specific traits or purposes.
- ***Privacy and Surveillance:*** The balance between individual privacy rights and societal needs for security, especially in the context of technology and surveillance.
- ***Immigration and Refugee Rights:*** Disputes regarding the ethical treatment of immigrants and refugees, particularly regarding borders, asylum policies, and national security.
- ***Economic Inequality:*** Moral debates about the fairness of wealth distribution and whether society should do more to address poverty and inequality.
- ***Cloning and Reproductive Technologies:*** Ethical concerns about the implications of cloning and assisted reproductive technologies, especially in relation to identity, rights, and societal impact.

20. Differentiate between biosafety and biosecurity.

1. **Biosafety:**

   Focus: Primarily concerned with protecting humans, animals, and the environment from exposure to harmful biological agents (like pathogens, toxins, or genetically modified organisms).

   Goal: To prevent accidental releases, exposures, or spills that could harm people or ecosystems.

   Measures: Includes lab safety protocols, containment practices (e.g., biosafety cabinets, controlled access), personal protective equipment (PPE), and training to minimize risks during experiments or work with biological materials.

   Example: Ensuring that research involving pathogenic bacteria is conducted in a facility with proper containment levels (e.g., BSL-3 or BSL-4 labs).

2. **Biosecurity:**

   Focus: Primarily concerned with preventing the misuse of biological materials, particularly to protect against intentional threats like bioterrorism or biowarfare.

   Goal: To safeguard against deliberate theft, diversion, or malicious use of biological agents that could cause harm to society or the environment.

Measures: Includes access control, monitoring of biological agents, security protocols, and regulatory oversight to prevent unauthorized access to hazardous biological materials.

Example: Preventing unauthorized individuals from accessing dangerous pathogens like anthrax or smallpox for malicious purposes.

21. What are rights of patients?

Patients have several fundamental rights to ensure they receive respectful, fair, and appropriate care. These rights include:

- ***Right to Informed Consent:*** Patients must be informed about their diagnosis, treatment options, and potential risks before any medical procedure or treatment.
- ***Right to Privacy and Confidentiality:*** Patients have the right to have their personal and medical information kept confidential, with limited exceptions.
- ***Right to Receive Adequate Care:*** Patients are entitled to receive proper and timely medical care, without discrimination based on race, gender, religion, or financial status.
- ***Right to Participate in Decision-Making:*** Patients have the right to actively participate in decisions regarding their health and treatment plans.
- ***Right to Access Medical Records:*** Patients can access and request copies of their medical records, ensuring transparency and the ability to make informed decisions.
- ***Right to Choose or Refuse Treatment:*** Patients can accept or refuse treatment, as long as they are mentally capable and fully informed of the consequences.
- ***Right to Be Treated with Respect and Dignity:*** Patients should be treated with respect, regardless of their background or health condition.
- ***Right to Second Opinion:*** Patients have the right to seek a second opinion from another healthcare professional if they are unsure about their diagnosis or treatment options.
- ***Right to Receive Care in a Safe Environment:*** Patients should receive care in a safe and clean environment, free from harm, neglect, or abuse.
- ***Right to Pain Management:*** Patients are entitled to appropriate measures for pain relief and palliative care when needed.

22. What are effects of global warming?

- ***Rising Sea Levels:*** Melting polar ice caps and glaciers contribute to higher ocean levels, leading to coastal flooding and the loss of land.
- ***Extreme Weather Events:*** Increased global temperatures result in more frequent and intense weather events, such as hurricanes, droughts, heatwaves, and heavy rainfall.
- ***Threats to Ecosystems:*** Global warming disrupts ecosystems, affecting biodiversity. Species may struggle to adapt to changing temperatures, leading to shifts in habitats and potential extinction.
- ***Ocean Acidification:*** Higher CO2 levels are absorbed by oceans, making them more acidic, which harms marine life, particularly coral reefs and shellfish.
- ***Impact on Agriculture:*** Changing weather patterns, droughts, and unpredictable rainfall affect crop yields, leading to food insecurity in many regions.

- ***Health Risks:*** Warmer temperatures can contribute to the spread of diseases carried by insects, like malaria and dengue. Heat-related illnesses also increase as temperatures rise.
- ***Disruption of Water Resources:*** Changes in precipitation patterns and glacial melting affect freshwater availability, leading to shortages in some areas.
- ***Loss of Biodiversity:*** Rising temperatures alter habitats and migration patterns, threatening many species with extinction, especially those that cannot adapt quickly.
- ***Melting Ice and Snow:*** Polar ice caps and glaciers are shrinking, contributing to sea level rise and the loss of habitats for cold-adapted species.
- ***Economic Costs:*** The effects of global warming—such as damage to infrastructure from extreme weather, reduced agricultural productivity, and rising healthcare costs—result in significant economic strain.

23. Mention four Nurses codes.

Here are four key nursing codes of ethics:

- ***Respect for Patient Autonomy:*** Nurses should respect the rights of patients to make their own decisions about their healthcare, including the right to accept or refuse treatment.
- ***Non-maleficence (Do No Harm):*** Nurses must avoid causing harm to patients and ensure that the care they provide does not negatively impact the patient's well-being.
- ***Beneficence:*** Nurses should act in the best interest of patients, providing care that benefits the patient and promotes their health and well-being.
- ***Confidentiality:*** Nurses are required to protect the privacy of patient information and ensure that personal and medical details are kept confidential unless disclosure is authorized or required by law.

Disclaimer:

For best results, it is advised NOT to rely on this file only. Go through video lectures, handouts and other sources as well.

Regards,
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