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**AYESHA KANWAL**

**BT605**

## **MID-TERM SOLVED PAST PAPERS**

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### **1: How should patient cooperate with his/her caregiver? 2**

- Give correct and complete information about your health status and health history.
- Ask questions if you do not understand information or instructions.
- Inform your caregivers if you do not intend to or cannot follow the treatment plan.
- Accept health consequences that may occur if you decide to refuse treatment or instructions. Cooperate with your caregivers.
- Respect the rights and property of other patients.
- Tell your caregivers of any medications you brought from home.
- Report any changes in your health status to your caregivers.

### **2: Write two types of Bio weapons? 2**

There are different types of bio weapons, two of these are given below:

1. Conventional weapons
2. Nuclear weapons

### **3: Write three principle of bioethics? 3**

Four commonly accepted principles of health care ethics, given below:

1. Autonomy
2. Justice
3. Beneficence
4. Respect

#### **Autonomy:**

First is the respect for autonomy. Any notion of moral decision-making assumes that rational agents are involved in making informed and voluntary decisions.

#### **Justice:**

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Justice in health care is usually defined as a form of fairness, or as Aristotle once said, "Giving to each that which is his due." This implies the fair distribution of goods in society and requires that we look at the role of entitlement.

### **Beneficence:**

The principle of beneficence may require you to act on the patient's behalf when her life is at stake.

### **Respect:**

The principle of respect for person obligates you to do your best to include the patient in the health care decisions that affect her life and body.

### **4: What is the biological reagent of bio weapons any six? 3**

1. Anthrax
2. Brucellosis
3. Small pox
4. Viral hemorrhagic fever
5. Staphylococcal enterotoxin B
6. Botulinum toxins

### **5: What is the global warming effect? Explain any Five. 5**

The implications for global warming and climate change are enormous.

- Earth climate zone is shifting
- Polar ice start melting
- Sea level increases
- Metabolic rate of methane producing bacteria increases
- Species may extinct

### **6: What is the issue of human embryo stem cells and therapeutic cloning? Explain? 5**

Ethical issues of human cloning have become an important issue in recent years. Many ethical arguments against human cloning are based on misconceptions. Many people think that these clones will have the same characteristics / personalities as the person cloned. Although clone and cloned individual have the same genes, traits and personalities are different. People think that a clone is physically identical to the donor and her behaviour, but this is not true because although there is a physical identity, living environment shapes an individual's ongoing behaviour and psychology. Many people believe that cloning will lead to loss of individuality eventually, but

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people have their own personality cloned which personality is similar to those in which they were created.

One of the most serious problems of cloning of human embryos for therapeutic purposes is that with harvesting stem cells, the embryo is formed by cloning practical killed. We cannot reduce the existence of a human embryo to "a cell" as long as after both science and teaching of the Church, the human embryo is a carrier of life.

Therapeutic cloning involves cloning cells from an adult for medicinal use and is an active research area, while reproductive cloning would involve the creation of human clones. Therapeutic cloning could provide unique ways to cure diseases until now considered incurable: diabetes, Parkinson's, Alzheimer's, heart disease.

### **BSL3 and BSL 4? 2**

#### **BSL-3:**

A BSL-3 laboratory has special engineering and design features. Products of conception containing or believed to contain pathogenic Brucella should be handled with BSL-3 practices due to the high concentration of organisms per gram of tissue. BSL-3 and ABSL-3 practices, containment equipment, and facilities are recommended, for all manipulations of cultures of pathogenic Brucella spp. listed in this summary, and for experimental animal studies.

#### **BSL-4:**

All laboratory staff and supervisors must be competent in handling agents and procedures requiring BSL-4 containment. There are two models for BSL-4 laboratories:

1. A Cabinet Laboratory—Manipulation of agents must be performed in a Class III BSC.
2. A Suit Laboratory—Personnel must wear a positive pressure supplied air protective suit.

BSL-4 cabinet and suit laboratories have special engineering and design features to prevent microorganisms from being disseminated into the environment.

### **R.C.H used in which disease and why? 2**

#### **Write chemicals which are used in disinfectants?**

- Bleach.
- Chlorine.
- Alcohol.
- Chlorine and chlorine compounds.
- Formaldehyde.
- Glutaraldehyde.

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- Hydrogen peroxide.
- Iodophors.
- Ortho-phthalaldehyde (OPA)
- Peracetic acid.

Enlist four disciplines which show the relationship of human with nature.

#### Advantage of UV in sterilization: 5 marks

- Face shields must also be used for protection against UV radiation and when handling liquid nitrogen.
- The most important benefit of UV light disinfection is that it's non-toxic. Unlike harsh chemicals that are sometimes used in cleaning and sanitization products, UV light is environmentally friendly.
- UV light disinfection is safe for use on food as well as food prep services and non food items.
- UV is a method of disinfection which can be more effective than other methods. UV light kills a wide array of harmful chemicals.
- UV light disinfection is a physical method for killing bacteria.

#### What are cybernetic ethical issues? Enlist.

1. Number of ethical issues has been raised like how machines are in charge of key human functions? By this technique only wealthy ones can communicate through cybernetics.
2. Then whether implants are safe to use because senses and impulses can be transmitted in a harmful way?
3. Can the senses be patented and who regulates?
4. Who regulates? Society needs to focus on regulatory framework.

#### Write difference between objective bad news and subjective bad news? 2

Objective Bad News	Subjective Bad News
An <b>objective</b> statement is based on facts and observations.	On the other hand, a <b>subjective</b> statement relies on assumptions, beliefs, and opinions and influenced by emotions and personal feelings.

#### Write containment zone? 3.

- Only be a chemical fume hood.
- Isolation of microorganisms.

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- Building systems, sealed rooms, and sealed containers and personnel suits.

**What is zoonosis? What is zoonotic disease and write name of diseases? 4.**

**Zoonosis** is a disease which can be transmitted to humans from animals.

**Zoonotic diseases:**

There is a small but significant risk of the transmission of usually fatal zoonotic diseases, such as:

1. Bovine spongiform encephalopathy,
2. Porcine endogenous retroviruses (PERVs)
3. Nipah encephalitis.

**Write down equipment name used in lab? 2**

Personal Protective Equipments are used in laboratory in reducing exposure to potentially infectious materials. PPE use must be put into its proper context, however.

PPE may include following equipment:

- Gloves
- Lab coats
- Lab shoes cover
- Safety glasses

**Write down BSL 3? Write any five points. 5 marks**

A BSL-3 laboratory has special engineering and design features.

1. Products of conception containing or believed to contain pathogenic *Brucella* should be handled with BSL-3 practices due to the high concentration of organisms per gram of tissue.
2. **BSL-3** and **ABSL-3** practices, containment equipment, and facilities are recommended, for all manipulations of cultures of pathogenic *Brucella* spp. listed in this summary, and for experimental animal studies.
3. **BSL-3** practices, containment equipment, and facilities are recommended for work involving production quantities or high concentrations of cultures, screening environmental samples (especially powders) from anthrax-contaminated locations, and for activities with a high potential for aerosol production.
4. Additional primary containment and personnel precautions, such as those recommended for **BSL-3**, should be implemented for activities with a high potential for aerosol or droplet production, or for those requiring routine handling of larger quantities of the organism or of the toxin.

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5. Additional primary containment and personnel precautions, such as those described for **BSL-3**, may be indicated for activities with potential for droplet or aerosol production and for activities involving production quantities or concentrations of infectious materials.
6. Additional containment and procedures, such as those described for **BSL-3**, should be considered when producing, purifying, and concentrating human herpes viruses, based on risk assessment.

### **How make decisions? Explain it.**

Making ethical choices requires the ability to make distinctions between competing options. Here are seven steps to help you make better decisions:

#### **1. Stop and think:**

This provides several benefits. It prevents rash decisions, prepares us for more thoughtful discernment, and can allow us to mobilize our discipline.

#### **2. Clarify goals:**

Before you choose, clarify your short-term and long-term aims. Determine which of your many wants and "don't want" affected by the decision are the most important. The big danger is that decisions that fulfill immediate wants and needs can prevent the achievement of our more important life goals.

#### **3. Determine facts:**

Be sure you have adequate information to support an intelligent choice. To determine the facts, first resolve what you know, then what you need to know. Be prepared for additional information and to verify assumptions and other uncertain information. In addition:

- Consider the reliability and credibility of the people providing the facts.
- Consider the basis of the supposed facts. If the person giving you the information says he or she personally heard or saw something, evaluate that person in terms of honesty, accuracy and memory.

#### **4. Develop options:**

Once you know what you want to achieve and have made your best judgment as to the relevant facts, make a list of actions you can take to accomplish your goals. If it's an especially important decision, talk to someone you trust so you can broaden your perspective and think of new choices. If you can think of only one or two choices, you're probably not thinking hard enough.

#### **5. Consider consequences:**

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Filter your choices to determine if any of your options will violate any core ethical values, and then eliminate any unethical options. Identify who will be affected by the decision and how the decision is likely to affect them.

### 6. Choose:

Make a decision. If the choice is not immediately clear, try:

- Talking to people whose judgment you respect.
- Think of a person of strong character that you know or know of and ask yourself what they would do in your situation.
- If everyone found out about your decision, would you be proud and comfortable?
- Follow the Golden Rule: treat others the way you want to be treated, and keep your promises.

### 7. Monitor and modify:

Ethical decision-makers monitor the effects of their choices. If they are not producing the intended results, or are causing additional unintended and undesirable results, they re-assess the situation and make new decisions.

### Science in 21st century?

Science is derived from a Latin term “**Scio**” that means observation and theoretical form, observation and experiment. Science is an investigation of the universe by a set of methodologies. In science progresses are made by scientific methods. This is a Step-wise, not a single activity, not a value free. Ethics is associated with science. Here issues arise from scientific research.

Scientists are trying to solve ethical issues. Science has entered in to our daily lives. Proper resource allocation reflects what society at the time deems to be valuable.

Philosophers might emphasize the methodological aspects of science focusing on experimentation, observation and theorizing as elements of the means by which reliable information about the natural world is gleaned through the practice of science. Historians are prone to view science as the accumulation of knowledge, stressing its archival aspect as a significant historical process worthy of special study. **Ziman** concludes that: **"Science is all these things and more. It is indeed the product of research; it does employ characteristic methods; it is an organized body of knowledge; it is a means of solving problems."** Scientists have a large body of knowledge that they can use in making decisions.

### Discuss the ethical issues related to nanomedicine? 5 marks

Assessing the safety of nanomaterials can be a difficult because nanomaterials are not a unified class of compounds. Each type of material must be assessed on its own terms. Risks are

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associated with nanoscale materials that depend on the route of exposure as it accumulates in different parts of the body and produce adverse effects. Thus ethical guidelines and regulations are required. Social & regulatory aspects of nanomedicine need to be discussed.

**Write two moral principles to deal with human embryo. 2 marks**

Two moral principles are:

- ✓ Duty-prevent suffering,
- ✓ Duty-respect the value of human life
- Harvesting of human embryo violate the second duty
- Aim of stem cell research is good-what about the moral principles

**Write advantages of patenting a gene. 3marks**

**Advantages:**

- Commercial interest
- Synthesis of generic drugs--AIDs
- Genetic based treatments
- Africa– increased cost –gene patenting

**Define and explain Bio hazards clarification.**

Biohazard outbreaks from pathogens and infectious diseases occur every day in the U.S. and throughout the world from Avian Influenza virus, HIV/AIDS, Hepatitis viruses, Norovirus (Norwalk virus), Salmonella bacteria, Mycobacterium tuberculosis bacteria, Vibrio cholerae bacteria (cholera), MRSA superbugs, Plasmodium parasites (malaria) and hundreds of other microorganisms. Bacteria, viruses and parasites are responsible for the bulk of the 18.4 million deaths worldwide from communicable diseases in 2004 estimated by the World Health Organization plus additional deaths from non-communicable diseases and cancers. Pathogens currently infects billions of people and trends indicate a rising number of pathogen deaths and infections from population growth in developing countries, urbanization, poor sanitation, broken water infrastructure, reduced food safety, globalization, international travel, extreme weather, and the rising costs of new drugs, vaccines and antibiotics. Many of these deaths are premature and preventable. The key to preventing major outbreaks is frequent and comprehensive testing for each suspected pathogen, as most occurrences of pathogens are not detected until after people get sick or die. With advances in nanotechnology, biotechnology, information technology and wireless technology, new generations of low cost biosensors and early warning systems will provide a front line of defense against the transmission of deadly pathogens. It is easy to recognize the biggest threat to humankind. Just count the dead, the dying, environmental

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damage, and economic costs. The world record holder for human deaths is *Yersinia pestis*. This disease-causing bacterium killed as many as 75 to 100 million people during the Black Plague, or roughly 20% of the world's 450 million population in the 14th century.

Some of the most common foodborne biohazards are *Salmonella* bacteria which are commonly found in poultry, eggs, unprocessed milk and meat; *Campylobacter* bacteria which infect people from undercooked chicken; *Listeria* bacteria which are found in soft French style cheeses, pates, uncooked hot dogs and sliced deli meats; and *Toxoplasma gondii*, a parasitic protozoa transmitted from undercooked meats and contact with cats, and is particularly dangerous to pregnant women and their unborn children.

Biohazards found in food have led to major recalls with enormous economic consequences. In every case of human and economic catastrophe from biohazards and infectious disease, pathogens had entered into a geographic area and were rapidly transmitted to a greater area. Early detection and containment is the simplest and most effective way to prevent human, animal, and environmental catastrophes. With advances in nanotechnology, biotechnology, information technology and wireless technology, new generations of low cost biosensors and early warning systems will provide a front line of defense against the transmission of pathogens.

#### Why we use animals in biotechnology? 5

Animal research has had a vital role in many scientific and medical advances of the past century and continues to aid our understanding of various diseases. Throughout the world, people enjoy a better quality of life because of these advances, and the subsequent development of new medicines and treatments all made possible by animal research. The use of animals in research can be ethically and morally justified. The benefits of animal research have been enormous and it would have severe consequences for public health and medical research if it were abandoned.

**Animal biotechnology** is a branch of **biotechnology** in which molecular biology techniques are **used** to **genetically engineer** (i.e. modify the genome of) **animals** in order to improve their suitability for pharmaceutical, agricultural or industrial applications. Biotechnology affects **human health**, **animal health**, welfare and increasing livestock productivity. **Biotechnology** improves the food we eat - meat, milk and eggs. **Biotechnology** can improve an **animal's impact** on the environment. And **biotechnology** enhances ability to detect, treat and prevent diseases.

#### Benefits of animal research:

- Benefits of animal research is enormous
- Good experiments reduce the number of animals
- Reduce the pain experienced by animals

#### Use of animals:

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## 1. Animals in sports, companionship, leisure and fashion

Animals in sport, companionship, leisure and fashion are all very important aspects of human association with animals. However, none of these is free of ethical implication. Much of the debate centers on the extent of the exploitation of animals. Some people argue the specially bred animals enjoy what people get them to do, but others might say that the animals have no choice. The horse, throughout history, has held a particularly important place in people's lives, and since the industrial revolution, sport has taken the place of work for the horse.

## 2. Race horses-peak fitness

The Grand National held every spring at Aintree, near Liverpool, is a famously tough horse race: a steeplechase, over four miles long with over 30 large fences to jump. Each year it attracts protesters claiming that it is cruel. Racehorses and other competition horses such as show jumpers and eventers are highly bred and rigorously trained to peak fitness.

## 3. Injuries in sports— save horses for breeding

They can very easily suffer injuries in their sports, and often these injuries are difficult or impossible to treat. Sometimes it is economical to try to save a horse for breeding, but generally if the injury is severe, owners will cut their losses and have the animal destroyed (i.e. shot).

### Use of animal fur:

- Luxury item for clothing
- Issues- animal welfare and conservation
- Leopard and jaguar are protected
- Mink breed for fur

### How Biotechnology can be more miss use? 2

Biotechnology has indeed done a lot of good for the world, but it also has disadvantages, and there are some concerns about its potential negative impacts. In agriculture, there are concerns that genetically modified crops may transfer genetic material into natural, unmodified plants.

Genetically modified organisms may also escape into the wild, especially transgenic microorganisms, and these events may upset the balance of the ecosystem in nature. This may cause a decrease in the biodiversity, also known as the variety, of organisms.

### Write three principles bioethics? 3

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1. Autonomy
2. Nonmaleficence and beneficence
3. Justice

**What is the code of nurses for their coworker? 2**

- The nurse's primary commitment is to the patient, whether an individual, family, group, or community.
- The **nurse** promotes, advocates for, and protects the rights, health, and safety of the patient.
- The nurse is responsible and accountable for individual nursing practice and determines the appropriate delegation of tasks consistent with the nurse's obligation to provide optimum patient care.
- The **nurse** practices with compassion and respect for the inherent dignity, worth, and unique attributes of every person.

**What are cybernetic ethical issues? Enlist any three? 3**

5. Number of ethical issues has been raised like how machines are in charge of key human functions? By this technique only wealthy ones can communicate through cybernetics.
6. Then whether implants are safe to use because senses and impulses can be transmitted in a harmful way?
7. Can the senses be patented and who regulates?

**What are the elements of human trafficking? 5**

**Elements:**

**1. The act (what is done)**

**Act:**

- Recruitment
- Transport
- Transferring
- Harboring
- Receipt of person

**2. The means (how it is done)**

**Means:**

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- Threat
- Use of force
- Abduction
- Fraud
- Abuse of power
- Payments/benefits

**3. The purpose (why it is done)**

- Prostitution
- Sexual exploitation
- Forced labor
- Slavery
- Removal of organs

**4. Responses (how it reacts)**

**Response:**

- Within the country or across borders
- Range of exploitative purposes
- Victimized children, men, women
- Involve organized victim group

**5. Prevention (how does it prevent)**

**Prevention:**

- Trafficking in persons
- Victims of human trafficking
- Trafficking offenders

**6. Education:**

**Education:**

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- Research and awareness rising
- Promotion of protocols and capacity building
- Strengthening of partnerships and coordination

### Write difference b/w Intrinsic and instrumental values.

Intrinsic value	Instrumental value
Intrinsic value is the value that environment and living forms have their own rights.	On the other hand, instrumental value is the supply of human's material needs. It has actual and potential use in supplying resources for human living. This topic is still debatable.
<b>For example:</b> Intrinsic value of birds/green and pleasant places have their own values. It mainly involves religion.	<b>For example:</b> Keeping in view the environmental challenges one must value environment for decision making like air/water quality, green house gas, protect biodiversity, maintain ecosystem, marine environment.

### How the genetic counselors design the session?

#### Role:

- Interpretation of family and medical histories
- Education - about inheritance, testing, management, prevention, resources
- Counseling to promote informed choices and adaptation to the risk

#### Session structure:

- Intake phase
- Initial contact
- Encounter phase
- Summary phase
- Follow-up phase

#### Results:

- Family history

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- Molecular test
- Increased maternal/ paternal age
- Abnormal maternal serum screening results
- Abnormal ultrasound
- Strong family history of cancer
- Predictive testing for adult-onset conditions

### **What is the massive destruction weapon? 2**

A weapon of mass destruction (WMD) is a nuclear, radiological, chemical, biological, or any other weapon that can kill and bring significant harm to a large number of humans or cause great damage to human-made structures (e.g., buildings), natural structures (e.g., mountains), or the biosphere.

### **What are ethical issues in using of human embryo stem cells and therapeutic cloning? (5)**

#### **Ethical issues of human embryo stem cells:**

##### **Ethical issues:**

- Two moral principles duty-prevent suffering, duty-respect the value of human life
- Harvesting of human embryo violates the second duty
- Aim of stem cell research is good-what about the moral principles
  - Fertilized eggs should be protected as they are human
- Even unconscious individuals are treated as persons
- Fertilized human egg before implantation doesn't satisfy the criteria of personhood
- don't remember—not worthy of respect-early stage of development
- Embryos don't have emotional, intellectual or psychological properties
- Degrees of respect
- Before implantation lesser degree
- Natural loss of embryos same as it occurs in stem cell research
- Nervous system of early embryos is not developed fully

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- In Jewish religion, human fetus < 40 days old-doesn't have the full human status
- Soul is "breathed in" to the human embryo on the 40 day after fertilization--Islam
- Stem cell research is acceptable due to therapeutic benefits
- Embryos cannot be donated to other couples

**Ethical issues of therapeutic cloning:**

**Ethical issues:**

- Moral status of the embryo ---- destruction
- Patient has the right to live
- Morally right for in vitro fertilization but morally wrong to save a child's life
- Potential donor exploitation
- Slippery slope ----- reproductive cloning different from therapeutic cloning
- No access and benefit to poor communities
- Raises issues of social justice and healthcare disparities

**What are ethical codes of biologists (5)**

codes:

- scientists--perform experiment --described in their experiments
- best interpretation
- summarize honestly
- acknowledge the contributors for publications
- treat manuscript confidentially
- no inaccurate or misleading information
- disclose financial resources
- help colleagues/ support professional organization

**You can also write its explanation, given below:**

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- Investigators will promote and follow practices that enhance the public interest or well-being;
- Investigators will use funds appropriately in the pursuit of their research;
- Investigators will follow government and institutional requirements regulating research such as those ensuring the welfare of human subjects, the comfort and humane treatment of animal subjects and the protection of the environment;
- Investigators will report research findings resulting from public funding in a full, open, and timely fashion to the scientific community;
- Investigators will share unique propagative materials developed through publicly funded research with other scientists in a reasonable fashion.
- Investigators will have actually carried out experiments as reported.
- Investigators will represent their best understanding of their work in their descriptions and analyses of it;
- investigators will accurately describe methods used in experiments;
- Investigators will not report the work of others as if it were their own;
- Investigators in their publications will adequately summarize previous relevant work;
- Investigators acting as reviewers will treat submitted manuscripts and grant applications confidentially and avoid inappropriate use;
- Investigators will disclose financial and other interests that might present a conflict of-interest in their various activities such as reporting research results, serving as viewers and mentoring students.
- Investigators serving as mentors will provide training and experience to advance the trainees' scientific skills and knowledge of ethical research practices;
- Investigators will provide appropriate help in advancing the careers of the trainees;
- Investigators will recognize research contributions of the trainees appropriately;
- Investigators will encourage and support the publication of results of trainees' research in a timely fashion without undisclosed limitations;
- Investigators will create and maintain a working environment that encourages cultural diversity.

### **What is bio-security (2)**

#### **Definition:**

- ✓ A set of preventive measures designed to reduce the risk of transmission of infectious agents. Security against the inappropriate use of potentially dangerous biological agents.

#### **Types of bio-security:**

##### **Types:**

- ✓ Laboratory bio-security programs

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- ✓ Animal bio-security
- ✓ Bio-weapons

**Write the types of patients advance directives. 3 marks**

**Types:**

- Living will—applies to treatment such as dialysis –limited
- Oral
- Terminal illness— if patient die shortly
- Health care power of attorney
- Durable power of attorney
- Agent/proxy
- Agent makes decisions

**What are the aims of disaster management? 3**

**Aims:**

- Assistance to maintain life
- Improve health
- Support the morale affected population
- Limited aid

**What is genetic screening and genetic testing? 5 marks**

Genetic screening	Genetic testing
<p>The study of a person's DNA in order to identify genetic differences or susceptibility to particular diseases or abnormalities is known as genetic screening.</p> <p>In genetic screening, individual or group show a risk of disease.</p> <p>Genetic screening raises many ethical issues</p> <ul style="list-style-type: none"><li>• Should the knowledge go outside the family</li><li>• Religious groups raise many ethical issues.</li><li>• Expensive/emotional distress for the patient</li><li>• Done for common diseases / part of medical record</li></ul> <p><b>Non-diagnostic testing includes:</b></p> <p><b>Forensic testing:</b> Forensic testing uses DNA</p>	<p>Genetic testing is "the analysis of chromosomes (DNA), proteins, and certain metabolites in order to detect heritable disease-related genotypes, mutations, phenotypes, or karyotypes for clinical purposes." It can provide information about a person's genes and chromosomes throughout life.</p> <p><b>Genetic testing</b> is a type of medical test that identifies changes in chromosomes, genes, or proteins. This test helps in the diagnosis of various genetic diseases. The results of a genetic test can confirm or rule out a suspected genetic condition or help determine a person's chance of developing or passing on a genetic</p>

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sequences to identify an individual for legal purposes. Unlike the tests described above, forensic testing is not used to detect gene mutations associated with disease. This type of testing can identify crime or catastrophe victims, rule out or implicate a crime suspect, or establish biological relationships between people (for example, paternity).

**Paternity testing:** This type of genetic test uses special DNA markers to identify the same or similar inheritance patterns between related individuals. Based on the fact that we all inherit half of our DNA from the father, and half from the mother, DNA scientists test individuals to find the match of DNA sequences at some highly differential markers to draw the conclusion of relatedness.

**Genealogical DNA test:** To determine ancestry or ethnic heritage for genetic genealogy.

**Research testing:** Research testing includes finding unknown genes, learning how genes work and advancing our understanding of genetic conditions. The results of testing done as part of a research study are usually not available to patients or their healthcare providers.

disorder. More than 1,000 genetic tests are currently in use, and more are being developed.

**Several methods can be used for genetic testing:**

- ✓ Molecular genetic tests (or gene tests) study single genes or short lengths of DNA to identify variations or mutations that lead to a genetic disorder.
- ✓ Chromosomal genetic tests analyze whole chromosomes or long lengths of DNA to see if there are large genetic changes, such as an extra copy of a chromosome, that cause a genetic condition.
- ✓ Biochemical genetic tests study the amount or activity level of proteins; abnormalities in either can indicate changes to the DNA that result in a genetic disorder

### What is sentience (3)

Sentience is the capacity to feel, perceive or experience subjectively. 18th-century philosophers used the concept to distinguish the ability to think (reason) from the ability to feel (sentience). In Eastern philosophy, sentience is a metaphysical quality of all things that require respect and care.

An animal is sentient if “it is capable of being aware of its surroundings, its relationships with other animals and humans, and of sensations in its own body, including pain, hunger, heat or cold.”

### Define cybernetics (2)

Cybernetics is the study of interactions between man, machine and animals. **Cybernetics** has the ability to explore regulatory system, their structures and functions. It is derived from a Greek word that means “**governance**”. Today because of this technique we can create “**Superhumans**”.

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**Write two precaution of use the thermometer. 2marks**

1. Do not touch the thermometer sensor tip with fingers. Use a soft damp cloth to wipe it if necessary.
2. Do not disassemble the thermometer.

Basic safety precautions should always be observed, especially when the thermometer is used on or near children and disabled persons.

**What is Exploitation of victim in human trafficking?**

**Exploitations:**

- Prostitution
- Sexual exploitation
- Forced labor
- Slavery
- Removal of organs

**Ethical issues in treatment of older sibling.2marks**

1. Normal fertile couples undergo in vitro fertilization in order to produce a baby that can be a stem cell donor for an older sibling.
2. The older sibling suffers from genetic disorder and the embryo created in vitro would be tested for the absence of mutation and is the positive tissue match to the older sibling
3. The condition suffered by the older sibling is not genetic but the child still needs donated stem cells.

**What is human activity in the loss of biodiversity? Enlist three in detail 3**

**Human activity:**

**1. Transformation of forests in to lands**

Clearance of tropical forest is due to the use of wood, need of a land. We are losing 7 million hectares per year and thus soil is also degrading without trees. Thus there is need for an international consensus to combat further loss.

**2. Pollution affects the ecosystem-loss of biodiversity:**

An important feature of biodiversity loss that must be taken into consideration when addressing this problem is the differentiated responsibility that states have.

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### 3. Tropical rain forest climax ecosystem:

Species and ecosystem diversity are concentrated in less developed states located in the tropics, but the impetus for conservation comes most adamantly from developed nations.

#### Which forest is called climax forest? 2marks

An early successional forest is known as climax forest.

#### Write the applications of cybernetic.3 marks

##### Applications:

- Replacing limbs instead of wooden limbs
- Heart pacemakers
- Artificial retinas
- Silicon chip function like nerves-replace lost neuronal function
- University ID card-chip

#### What is lock box situation? 2 marks

“lock box” patient restricted physician from disclosing, lockbox banking is a service provided by banks to companies for the receipt of payment from customers. Under the service, the payments made by customers are directed to a special post office box instead of going to the company.

#### In which fields do we use bio-safety? 2 marks

##### Fields:

- Ecology
- Agriculture
- Medicine
- Chemistry
- Exobiology
- Synthetic biology

#### Give Ethical issues in genetic screening? 2marks

Genetic screening raises many ethical issues

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- Should the knowledge go outside the family?
- Religious groups raise many ethical issues.
- Expensive/emotional distress for the patient
- Done for common diseases / part of medical record

**What are the types of pathogens? 5 marks**

**WHO:**

**• WHO risk group 1:**

Microbes unlikely to cause disease

**• WHO risk group 2:**

Microbes causing diseases-unlikely to be serious

**• WHO risk group 3:**

Pathogens causing serious disease

**• WHO risk group 4:**

Pathogens causing serious disease ---- transmission-----no effective treatment or preventive measures

**What are the rights of patients? 5 marks**

(1) The patient has the right to receive information from physicians and to discuss the benefits, risks, and costs of appropriate treatment alternatives. Patients should receive guidance from their physicians as to the optimal course of action.

(2) The patient has the right to make decisions regarding the health care that is recommended by his or her physician. Accordingly, patients may accept or refuse any recommended medical treatment.

(3) The patient has the right to courtesy, respect, dignity, responsiveness, and timely attention to his or her needs.

(4) The patient has the right to confidentiality. The physician should not reveal confidential communications or information without the consent of the patient, unless provided for by law or by the need to protect the welfare of the individual or the public interest.

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(5) The patient has a basic right to have available adequate health care. Physicians, along with the rest of society, should continue to work toward this goal. Fulfillment of this right is dependent on society providing resources so that no patient is deprived of necessary care because of an inability to pay for the care.

**What do you mean by spleen removal? 3 marks**

In terms of medical ethics, removal of the spleen was an act of doing good beneficence, patient's personal autonomy had been respected, it was for the sake of his health that spleen has been removed. A man presents with symptoms representing cancer and as part of his treatment spleen should be removed.

**Explain Patient's advance directives.**

Direct your care through an Advance Directive. Advance Directives are legal forms which state your choices about the care you want to receive in serious health situations. Advance Directives are also used to name someone to make decisions for you if you cannot speak for yourself. At your request, we will help you create an Advance Directive. The Patient Self-determination and advance directives (PSDA) require all health care agencies to recognize the living will and durable power of attorney for health care. Under the PSDA, health care agencies must ask you whether you have an advance directive. They also must give you information about your rights under state law.

**Some advance directives are:**

- Appoint someone to make decisions
- Legal document-tell physician about your wishes
- General (donation) or detailed (treatment plan)

**Types:**

- Living will-applies to treatment such as dialysis –limited
- Oral
- Terminal illness— if patient die shortly
- Health care power of attorney
- Durable power of attorney
- Agent/proxy
- Agent makes decisions

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**Describe WHO classification. 5marks**

**WHO:**

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## **BT605 Midterm Solved Past Papers.**

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