1. What are the stages in the development of a vaccine? Why are the ongoing efforts to develop a vaccine for the Corona virus unprecedented? Discuss.

Demand of the question:

It expects students to give a clear account of the stages in the development of a vaccine. It also expects students to present a case for unprecedented efforts to develop a vaccine for the corona virus and finally arrive at a conclusion.

Introduction:

The outbreak of the novel coronavirus has triggered an international effort to develop a safe and effective vaccine against COVID-19, perhaps at breakneck speed. Several experimental vaccines have shown promising results in early trials, rising hopes that one will exist before the end of the year.

Body:

Stages in the development of a vaccine:

According to the Centres for Disease Control and Prevention (CDC), there are six stages of vaccine development: exploratory, pre-clinical, clinical development, regulatory review and approval, manufacturing and quality control.

- Exploratory: This is research-intensive phase of the vaccine development process which is designed to identify "natural or synthetic antigens that might help prevent or treat a disease."
- Pre-clinical: During this phase, researchers use tissue-culture or cell-culture systems and animal testing to determine whether the candidate vaccine will produce immunity or not.
- Clinical development: It is a three-phase process. During Phase I, small groups of people receive the trial vaccine. In Phase II, the clinical study is expanded and vaccine is given to people who have characteristics similar to those for whom the new vaccine is intended. In Phase III, the vaccine is given to thousands of people and tested for efficacy and safety.
- Regulatory review and approval: If a vaccine passes through all three phases of clinical development, the vaccine developer submits a Biologics License Application (BLA) to the licensing authority.
- Manufacturing: Major drug manufacturers provide the infrastructure, personnel and equipment necessary to create mass quantities of vaccines.
- Quality control: Stakeholders must adhere to procedures that allow them to track whether a vaccine is performing as anticipated.

With respect to COVID-19 vaccine development. The adenoviral vector-based vaccine is currently in the phase II trials. The vaccine is being developed by Russian military and government researchers. The ongoing efforts to develop a vaccine for the Corona virus are unprecedented due to the following reasons:

- The World Health Organisation listed 160 vaccines in development at various stages of research and development. This makes it the biggest vaccine development effort in the history of mankind while a pandemic is still on.

- The COVID-19 pandemic has had far-reaching consequences beyond the spread of the disease itself and efforts to quarantine it, including political, cultural, and social implications.
- The focus of manpower and resources on vaccine development for covid-19 is unparalleled because of no availability of any effective vaccine or medicine to fight the Coronavirus.
- Till today, Coronavirus has infected nearly 18 million people and took death toll of nearly 6,93,000 people worldwide. Hence, its sheer impact on the health of the people worldwide is disastrous.
- In the global economic sector lockdowns have resulted in disruption of supply chain leading to halt of the economic activities.
- According to a study by world bank, a severe pandemic can cause economic losses equal to nearly 5% of global GDP.
- The pandemic has affected educational systems worldwide, leading to the widespread closures of schools and universities. According to data released by UNESCO, school and university closures due to COVID-19 were implemented nationwide in 165 countries. Including localized closures, this affects over 1.5 billion students worldwide, accounting for 87% of enrolled learners.
- Low income groups are disproportionately hit by coronavirus cases. e.g. Migrant crisis in India.
- The pandemic has impacted religion in various ways, including the cancellation of the worship services of various faiths, as well as the cancellation of pilgrimages surrounding observances and festivals.
- The coronavirus pandemic has been followed by a concern for a potential spike in suicides, exacerbated by social isolation due to quarantine and social-distancing guidelines, fear, and unemployment and financial factors.
- Many countries have reported an increase in domestic violence and intimate partner violence attributed to lockdowns amid the COVID-19 pandemic. Financial insecurity, stress, and uncertainty have lead to increased aggression at home, with abusers able to control large amounts of their victims' daily life. Older people are particularly affected by COVID-19 as older age group has registered more number of deaths due to coronavirus infection.

Conclusion:

Hence, we can observe that coronavirus pandemic has impacted almost every sector and left a disastrous impact on the affected sector or groups. Due to this sheer scale of impact it becomes imperative to expedite the vaccine development to unprecedented level so that its impact will be minimised and a pre-covid-19 normalcy can be brought in to lives of people.

2. What are the different types of vaccines for the Coronavirus being tested in different parts of the world? Explain.

Demand of the question:

It expects students to explain different types of vaccines and for the Coronavirus being tested in different parts of the world.

Introduction:

As per WHO more than 160 vaccines are in development stage against coronavirus by research teams in companies and universities across the world. Researchers are trialling different technologies, some of which haven't been used in a licensed vaccine before. At least six groups have already begun injecting formulations into volunteers in safety trials; others have started testing in animals.

Body:

All vaccines aim to expose the body to an antigen that won't cause disease, but will provoke an immune response that can block or kill the virus if a person becomes infected. There are at least seven types being tried against the coronavirus, and they rely on different viruses or viral parts.

- Inactivated vaccine — The whole virus is killed with a chemical and used to make the vaccine. This is the same approach that is used to make the inactivated polio (shot), hepatitis A and rabies vaccines. e.g. Sinovac Biotech in Beijing has started to test an inactivated version of SARS-CoV-2 in humans.
- Subunit vaccine — A piece of the virus that is important for immunity, like the spike protein of COVID-19, is used to make the vaccine. This is the same approach that is used to make the hepatitis and human papillomavirus vaccines.
- Weakened, live viral vaccine — The virus is grown in the lab in cells different from those it infects in people. As the virus gets better at growing in the lab, it becomes less capable of reproducing in people. The weakened virus is then used to make the vaccine. When the weakened virus is given to people, it can reproduce enough to generate an immune response, but not enough to make the person sick. This is the same approach that is used to make the measles, mumps, rubella, chickenpox and one of the rotavirus vaccines. e.g. Oxford University vaccine, also referred to as AZD1222.
- Replicating viral vector vaccine — In this case, scientists take a virus that doesn't cause disease in people (called a vector virus) and add a gene that codes for, in this case, the coronavirus spike protein. Genes are blueprints that tell cells how to make proteins. The spike protein of COVID-19 is important because it attaches the virus to cells. When the vaccine is given, the vector virus reproduces in cells and the immune system makes antibodies against its proteins, which now includes the COVID-19 spike protein. As a result, the antibodies directed against the spike protein will prevent COVID-19 from binding to cells, and, therefore, prevent infection. This is the same approach that was used to make the Ebola virus vaccine.
- Non-replicating viral vector vaccine — Similar to replicating viral vector vaccines, a gene is inserted into a vector virus, but the vector virus does not reproduce in the vaccine recipient. Although the virus can't make all of the proteins it needs to reproduce itself, it can make some proteins, including the COVID-19 spike protein. No currently licensed vaccines use this approach.

- DNA vaccine : The gene that codes for the COVID-19 spike protein is inserted into a small, circular piece of DNA, called a plasmid. The plasmids are then injected as the vaccine. No currently licensed vaccines use this approach.
- mRNA vaccine:In this approach, the vaccine contains messenger RNA, called mRNA. mRNA is processed in cells to make proteins. Once the proteins are produced, the immune system will make a response against them to create immunity. In this case, the protein produced is the COVID-19 spike protein. No currently licensed vaccines use this approach. The US governments partially funded Moderna's vaccine is based on mRNA approach.

It is likely that COVID-19 vaccines could have different levels of effectiveness in various subgroups of people. Because the elderly generally do not respond as well to vaccines, one or more COVID-19 vaccines may not work well for them. At present, three vaccine candidates are at the final stage of their trials. Among them, Oxford's COVID-19 vaccine has shown a positive result in its initial trial.

Conclusion:

Keeping in mind the pandemic situation, many of these research institutes and universities are working at a breakneck speed to develop vaccine. Though the they have adopted different approaches to develop the vaccine, in the end what matters is how effective the vaccine is; so that whole humanity can be saved from the disastrous impact of this global pandemic.

3. How do mobile apps pose a threat to internal security? Examine.

Demand of the question:

It expects students to put forth view of how mobile apps pose a threat to internal security and what needs to be done to tackle this threat to internal security.

Introduction:

The Ministry of Information Technology, invoking it's power under section 69A of the Information Technology Act, in view of the emergent nature of threats has decided to block 47 more Chinese apps in addition to 59 apps. The reasons cited in view of information available that they are engaged in activities which is prejudicial to sovereignty and integrity of India, defence of India, security of state and public order.

Body:

Mobile users are generally unaware of the importance of internal security and often assume mobile apps are safe for download. Such lax mindsets, as well as the low cost and ease in developing mobile malware, mean apps are now the main source of mobile threats to internal security. Following kind of cyber attacks or stealing of information can be done through mobile apps:

- Malware, short for malicious software refers to any kind of software that is designed to cause damage to a single computer, server, or computer

network. Ransomware, Spy ware, Worms, viruses, and Trojans are all varieties of malware.

- For instance, WannaCry, it was a ransomware attack that spread rapidly in May, 2017. The ransomware locked users' devices and prevented them from accessing data and software until a certain ransom was paid to the criminals. Top five cities in India (Kolkata, Delhi, Bhubaneswar, Pune and Mumbai) got impacted due to it.
- Phishing: It is the method of trying to gather personal information using deceptive e-mails and websites. It occurs when an attacker, masquerading as a trusted entity, dupes a victim into opening an email, instant message, or text message. It is often used to steal user data, including login credentials and credit card numbers. e.g. A malware attack on Kudankulam power plant.
- Denial of Service attacks: A Denial-of-Service (DoS) attack is an attack meant to shut down a machine or network, making it inaccessible to its intended users. DoS attacks accomplish this by flooding the target with traffic, or sending it information that triggers a crash.
- For instance, six banks were attacked in the USA in 2012. If denial of service attack is initiated on the banking system in India, it would lead to structural collapse of the system and will result in creating chaos.
- A local, state or central government maintains huge amount of confidential data related to country (geographical, military strategic assets etc.) and citizens. Unauthorized access to the data can lead to serious threats on a country. e.g. Aadhar data breach.
- Photos, videos and other personal information shared by an individual on social networking sites can be inappropriately used by others, leading to serious and even life-threatening incidents. So it is also harmful for the citizens of India. e.g. Honey trapping incidences with respect to defence personnel.
- Company employees have a lot of data and information on their mobiles. A cyber attack or stealing of information through mobile apps may lead to loss of competitive information (such as patents or original work), loss of employees/customers private data resulting into complete loss of public trust on the integrity of the organization.
- Many of the public personnel also store important relevant data on mobile. Their mobile microphone or camera can be turned on through distant communication, resulting in breach of security.
- India's push towards cashless payments accelerated in 2019, as card and mobile payments as a percentage of GDP rose to 20%. Since most of the times payments are done through mobile phones, a malicious app can steal the sensitive information of the user and pose a financial security threat to the user.

Hence, due to the evolutionary nature of the mobile apps they pose a grave threat to the internal security of country. Following are the government initiatives and necessary steps which will help to tackle this internal security threat.

- Budapest Convention on Cybercrime: It is an international treaty that seeks to address Internet and computer crime (cybercrime) by harmonizing national laws, improving investigative techniques, and increasing cooperation among nations.
- As most of the mobile apps market is dominated by China there is need to give impetus to develop indigenous apps which will in turn help to have a secure use of important apps. e.g. AatmaNirbhar bharat app innovation challenge.
- Cyber Surakshit Bharat Initiative: It was launched in 2018 with an aim to spread awareness about cybercrime and building capacity for safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments. The mandate of this initiative also needs to be expanded to include mobile app based threats too.
- International cooperation: Looking forward to becoming a secure mobile ecosystem, India needs to join hands with several developed countries like the United States, Singapore, Japan, etc. These agreements will help India to challenge even more sophisticated mobile app based cyber threats.
- Also individual level strategy needs to be adopted to secure the data such as, lock the phone with a intricate pass code, encrypting storage, learning to remotely wipe the cell phone, etc.

Conclusion:

India today accounts for nearly 420 million mobile phone users. A single mobile data breach can pose a bigger threat of national internal security in front of any country. Hence, it becomes imperative to be well prepared to tackle any of these kind of challenges if arises in future. Which will ensure a safety of the confidential as well as personal information of users in turn helping to secure country's internal security.

4. What are your views on the recently announced National Education Policy (NEP)? Will it lead towards better scientific temper amongst students? Discuss.

Demand of the question:

It expects students to express their views on the recently announced National Education Policy. It also expects to put both side views of whether this policy will impart better scientific temper amongst students or not.

Introduction:

The Union Cabinet approved a new National Education Policy,2020 (NEP) which aims to make "India a global knowledge superpower". The National Education Policy, 2020 is meant to provide an overarching vision and comprehensive framework for both school and higher education across the country.

Body:

Some of the key proposals of new National Education Policy:

- The NEP proposes to change the school curricular structure from the current 10+2 (Class 1-10 of general education followed by two years of higher

secondary school with specialised subjects) with a 5+3+3+4structure, bringing children from ages 3 to 5 years within the formal education system for first time, and ensuring circular continuity in the last four years.

- A mission for foundational literacy and numeracy, free breakfasts being added to free lunches in government schools, vocational education, new technological skills such as coding along with internships from Class 6, and proposed redesign of the board examinations are some other major initiatives for school education.
- A new umbrella regulator will absorb arts and science, technical and teacher education into its fold, replacing several existing regulatory bodies, and also ensure a level playing field for public and private players.
- For students, the biggest change is the introduction of four-year undergraduate degrees, with options for entry and exit at various stages, a credit transfer system.
- Class 10 and 12 board examinations to be made easier, to test core competencies rather than memorised facts, with all students allowed to take the exam twice.
- Holistic Undergraduate education with a flexible curriculum can be of 3 or 4 years with multiple exit options and appropriate certification within this period.
- Multidisciplinary Education and Research Universities (MERUs), at par with IITs, IIMs, to be set up as models of best multidisciplinary education of global standards in the country. Standalone technical universities, health science universities, legal and agricultural universities, will be set up with an objective to be the multidisciplinary universities.
- The National Research Foundation will be created as an apex body for fostering a strong research culture and building research capacity across higher education.
- An autonomous body, the National Educational Technology Forum (NETF), will be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration.

The new National Education Policy is introduced after a 34 years gap. While addressing some long pending changes this policy aims to instil scientific temper as follows:

- Fundamental duties, enshrined in the Constitution under Article 51A . Fundamental duty under Article 51A (h) encourages the citizen to “develop the scientific temper, humanism and the spirit of inquiry and reform".
- The NEP strives to introduce vocational training and new technological skills such as coding through standard 6 itself. It will ensure that student is exposed to the real world life applications of theory through the clearly articulated scientific and technological methods.
- Provision of new umbrella regulator who subsumes almost all fields in itself will ensure educational solutions through cross fertilisation of the issues and in turn imbibing a scientific approach in to students through the regulations.

- Class 10 and 12 board examinations are made easier, it will test core competencies rather than memorised facts. Hence, instead of rote learning the conceptual clarity of concepts and understanding of subject will take place.
- Assessment reforms with 360 degree Holistic Progress Card, tracking Student Progress for achieving Learning Outcomes will not only help for the overall development of the student but also to help the student understand his/her inclination in different aspects of curriculum.
- The National Research Foundation's objective is to foster a strong research culture and building research capacity across higher education. It will help to develop scientific research culture in the students.
- Multidisciplinary Education and Research Universities (MERUs) and specialised technical universities will help to develop a skilled student of generalist as well as specialist tendencies.
- National Educational Technology Forum (NETF), and provision of setting up foreign institutions in the society will help to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration.

Conclusion:

A New Education Policy aims to facilitate an inclusive, participatory and holistic approach, which takes into consideration field experiences, empirical research, stakeholder feedback, as well as lessons learned from best practices. It is a progressive shift towards a more scientific approach to education. If implemented in its true vision, the new structure can bring India at par with the leading countries of the world.

5. What do you understand by the term 'transfer of technology'? Why is it important? Illustrate with the help of suitable examples.

Demand of the question:

It expects students to write down what they understand by the term 'transfer of technology'. It also expects students to write about the importance of transfer of technology with relevant examples.

Introduction:

Transfer of technology is a process of transferring technology (innovations, knowledge and techniques) from one organisation or country to another organisation or country through formal or informal channels. Formal channels include FDI, licensing, trade, foreign patenting etc. whereas informal channels include imitation and counterfeiting.

Body:

Transfer of technology occurs along various axes: among universities, from universities to businesses (and vice versa), from large businesses to smaller ones (and vice versa), from governments to businesses (and vice versa), across

geopolitical borders, both formally and informally, and both openly and surreptitiously.

Transfer of technology includes:

- Identifying new Technologies.
- Protecting Technologies Through Patents and copyrights.
- Forming and transferring Development and commercialization strategies such as marketing and licensing to existing private sector companies or creating new start up companies based on Technology.
- For instance, Rafael deal with France involves Transfer of Technology for manufacturing Medium Multirole Combat Aircrafts, which India lacks currently.

Importance of Transfer of Technology:

- Exploration of new markets – Markets of developed countries are saturated. Hence, technology transfer to new emerging markets in developing countries will help to address the socio-economic and political problems over there.
- Dealing with global common threats like COVID-19, requires all countries to be equipped technologically. Here technology transfer can be an important tool.
- Financial Benefits for countries who can't afford to buy new equipment every time they need to upgrade e.g. military equipment which needs regular up gradation.
- India demands environmentally friendly technology to ensure low-emission economic development from western world under Paris climate change to check climate change. So technology transfer through alliances such as International solar alliance may help to tackle global common threats like climate change.
- To meet social-economic goals: India's self sufficiency in food can be attributed to the transfer of valuable technology of High yielding varieties seeds and good agronomic practices from USA to India. Technology certainly saved country which was on the brink of famine.
- To meet global objectives: It is the transfer of renewable energy technology from developed nations to developing world that will do common good in the wake of global climate change phenomenon.
- It will help to reduce unnecessary expenses. Transfer of advanced military technology would avoid any kind of dependency over foreign countries. A technology once known would benefit in saving foreign exchange kitty.
- To safeguard the borders: To make anti-tank guided missiles, Kalyani Rafael Advanced Systems (KRAS), a joint venture between Kalyani Strategic Systems Ltd. and Rafael Advanced Defence Systems Ltd. of Israel.
- In addition, technology transfer ensures that the interests and rights of the university in the intellectual property are protected. The university is able to retain the intellectual property rights of the technology and issue a license for the conditional use of the technology.

- The ultimate beneficiary of technology transfer is the public, who benefits from both the products that reach the market and the jobs resulting from the development, manufacturing, and sale of products.
- Technology transfer works to complement academic research by pushing innovations out the lab door and into the hands of industry partners who will develop them into products for the benefit of the general public.

However, transfer of technology poses some challenges too:

- It kills the innovative spirit of the researcher as ready to implement technology is handed over.
- It also puts the country or the organisation in to heavy financial burden as technology transfer comes with heavy price.
- It also makes the country vulnerable in future to secure its sovereignty and independence. e.g. Transfer of technology in the defence and nuclear sector.
- It can influence economic, defence and foreign policy formulation of country as the country becomes dependent on other country for the technological needs.

Conclusion:

Transfer of technology have played a crucial role in all round development of the country. Its multifaceted benefits can't be ignored when it benefits public on the large scale. Hence, transfer of technology approach if adopted with the approach of indigenisation of technology will surely help India to be a giant player in the world economy.

6. How can technologies like blockchain and internet of things (IoT) transform the lives of common citizens?

Demand of the question:

It expects students to write about how the application of new emerging technologies like Internet of things and block chain can transform the lives of common citizens.

Introduction:

Emerging technologies such as block chain and Internet of things (IoT) are often perceived as capable of changing the status quo. Emerging technologies have wide ranging application hence, possess the potential to transform the lives of common citizens.

Body:

Emerging technologies can be applied in various fields such as health, finance, agriculture and various other sectors which would aid the government in implementing various programmes and in turn assisting to transform the lives of people.

- Block chain technology as a public ledger system, records and validate each and every transaction made, which makes it secure and reliable. Which can

overcome the challenge of securing each and every transaction over the internet.

- It will also help to increase the number of cashless trade. Block chain technology can also be used in the preservation an use of large scale data like Aadhar card data, PAN card data etc.
- The transfers are done through mining that makes hacking difficult. All transactions carried out are authorized by miners, making the transactions unchanged and preventing the hacking threat. Hence, this technology will also help to build more trust in the online payment system.
- Blockchain could be used to improve a variety of healthcare-related processes, including record management, healthcare surveillance, tracking disease outbreaks, management crisis situations and many more.
- A growing portion of IoT devices are created for consumer use, including connected vehicles, home automation, wearable technology, connected health, and appliances with remote monitoring capabilities.
- Donation tracking: With the help of block chain capabilities, donors can see where funds are most urgently required and can track their donations until they are provided with verification that their contributions have been received to the victims.
- Blockchain could also manage a crisis situation. It could instantly alert the public about the virus by global institutes like the WHO using smart contracts tracing concept.
- In education sector the blockchain-based SuperCert promises anti-fraud identity intelligence blockchain solution for educational certificates. It ensures authenticity and minimizes fraud. In turn it will help to have genuine learners who can complete their studies more neatly and obtain a certificate accordingly. It will transform life of people by providing more learned individuals in the society.
- The Internet of Medical Things (IoMT) is an application of the IoT for medical and health related purposes, data collection and analysis for research, and monitoring.
- IoT devices can be used to enable remote health monitoring and emergency notification systems. These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fitbit electronic wristbands, or advanced hearing aids. So these kind of technologies will help the people to have a healthy life style and good health care.
- Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle, the infrastructure, and the driver or user). Dynamic interaction between these components of a transport system enables inter- and intra-vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistics and fleet management, vehicle control, safety, and road assistance.
- Smart cities: IoT will solve major problems faced by the people living in cities like pollution, traffic congestion and shortage of energy supplies etc. Products

like cellular communication enabled Smart Belly trash will send alerts to municipal services when a bin needs to be emptied.

- Agriculture: Farmers are using meaningful insights from the data to yield better return on investment. Sensing for soil moisture and nutrients, controlling water usage for plant growth and determining custom fertilizer are some simple uses of IoT.
- Environmental monitoring: To assist in environmental protection by monitoring air or water quality, atmospheric or soil conditions, and can even include areas like monitoring the movements' of wildlife and their habitats.

Despite the numerous applications and its wide scale benefits these emerging technologies have some drawbacks to transform human lives, they are as follows:

- Over-reliance on technology: Relying on technology on a day to day basis, making decisions by the information that it gives up could lead to devastation. No system is robust and fault-free.
- Security: As the IoT systems are interconnected and communicate over networks. The system offers little control despite any security measures, and it can be lead the various kinds of network attacks. Hence, it jeopardises personal lives of people.
- Lack of understanding comes next as many executives have a vague understanding of blockchain and the changes it will bring. Many still connect it only with crypto currencies management.
- A lack of general regulation is a problem. The Supreme Court of India has ruled against a decision imposed by the country's central bank nearly two years ago that stifled crypto trading in Asia's third-largest economy.

NITI Aayog has released recommended to establish IndiaChain which will ensure Creation of a national infrastructure for the deployment of blockchain solutions with inbuilt fabric, identity platform and incentive platform. Along with it NITI aayog has also proposed to use Internet of Things to tackle the water crisis in various parts of India.

Conclusion:

Hence, we can conclude that emerging technologies such as blockchain and Internet of things possess a big potential to transform human lives. But at the same time their implementation challenges needs to be addressed so that these technologies will not just be useful to transform the lives of the common citizens but also to transform the whole world and make it a better world.

7. What is immunotherapy? What are its applications? Illustrate.

Demand of the question:

It expects students to write about the immunotherapy and its applications with relevant examples.

Introduction:

Immunotherapy, also called biologic therapy, is a type of treatment designed to boost the body's natural defences against any disease or infection. It uses substances either made by the body or in a laboratory to improve or restore immune system function.

Body:

In recent years, immunotherapy has become of great interest to researchers, clinicians and pharmaceutical companies, particularly in its promise to treat various forms of cancer.

- Immunotherapy tries to help the immune system recognise cancer as a threat, and attack it.
- Rather than attacking the disease directly, as chemotherapy does in cancer, immunotherapy tries to rally the patient's own immune system to fight the disease.
- Immune system is a network of cells, tissues and bio chemicals they secrete. It defends the body against the viruses, bacteria and other invaders.
- For example, Immunotherapy involves drugs that free immune cells to fight cancer. These drugs blocks a mechanism called checkpoint. Checkpoint is used by cancer to shut down the immune system.

Applications of Immunotherapy:

- Recent use of immunotherapy to treatment of AIDS: Scientists used two prevalent anti-HIV antibodies which were inserted in test animal i.e. here Monkey after it is infected with the virus similar to HIV . In response to these anti-biotic monkeys showed improved immunity to fight with the virus in linger period .
- Novel developments in immunotherapy have led to a new era in cancer treatment. Immunotherapy looks like a promising new strategy for cancer treatment . It may be able to control tumour growth and has fewer side effects than chemotherapy.
- A sub part of Immunotherapy is Immune enhancement therapy. Autologous immune enhancement therapy use a person's own peripheral blood-derived natural killer cells, and other relevant immune cells are expanded in vitro and then re-infused.
- The therapy has been tested against Hepatitis C and Chronic fatigue syndrome.
- Suppression immunotherapy's: Immune suppression dampens an abnormal immune response in autoimmune diseases or reduces a normal immune response to prevent rejection of transplanted organs or cells.
- Immunosuppressive drugs help manage organ transplantation and autoimmune disease. Immune responses depend on lymphocyte proliferation.
- Immune tolerance therapies seek to reset the immune system so that the body stops mistakenly attacking its own organs or cells in autoimmune disease or accepts foreign tissue in organ transplantation.

- Immunotherapy is used to treat allergies. While allergy treatments (such as antihistamines or corticosteroids) treat allergic symptoms, immunotherapy can reduce sensitivity to allergens, lessening its severity.

Though Immunotherapy shows prospects of promising future in strengthening the immune system of the body, it has some drawbacks too:

- The area where the medication goes into body could hurt, itch, swell, turn red, or get sore.
- Some types of immunotherapy rev up immune system and make the person feel like having a flu, complete with fever, chills, and fatigue.

Conclusion:

New advancements in the field of healthcare have improved the life expectancy of a person. The emerged field of immunotherapy in the healthcare sector has shown promising trends in healing cancer like incurable diseases. Further investment in research and creating a necessary skilled workforce can immensely benefit the health of a person in turn contributing for socio-economic welfare.

8. How does plasma therapy work? Explain.

Demand of the question:

It expects students to give a clear account of the basics of plasma therapy. It also expects students to write about the working mechanism of plasma therapy and its recent health sector needs and probable applications.

Introduction:

Several countries, including India, are seriously looking at plasma therapy as a potential treatment for Covid-19, the disease caused by the novel coronavirus. Plasma therapy uses blood donated by recovered patients to introduce antibodies in those under treatment.

Body:

This therapy's concept is simple and is based on the premise that the blood of a patient who has recovered from disease contains antibodies with the specific ability of fighting virus. The theory is that the recovered patient's antibodies, once ingested into somebody under treatment, will begin targeting and fighting the virus in the second patient.

Working mechanism of plasma therapy:

- The plasma therapy uses antibodies developed within an infected person while he/she is infected with the virus.
- These antibodies are developed in a patient as part of the body's natural immune response to a foreign pathogen.
- These antibodies are highly specific to the invading pathogen and so, work to eliminate the foreign pathogen from the patient's body.

- Once the patient has recovered, they donate their blood so that their antibodies can be used to treat other patients. The donated blood is then checked for the presence of any other disease-causing agents such as Hepatitis B, Hepatitis C, HIV etc.
- If deemed safe, the blood is then taken through a process to extract 'plasma', the liquid part of the blood that contains antibodies. The antibody-rich plasma, once extracted, is then ingested into the body of a patient under treatment.
- Earlier, the United States used plasma of recovered patients to treat patients of Spanish flu. In 2009, the Swine flu (H1N1) patients were treated with plasma. It has also been used to treat critically ill patients during Ebola as well.
- It is also proved effective in the COVID-19 outbreak when COVID-19 patients treated with convalescent plasma have garnered good results.

Besides the success of the convalescent plasma therapy, the study by John Hopkins immunologists stated some of the risks associated with it:

- Transfer of blood substances: As the blood transfusion takes place, there are risks that an inadvertent infection might get transferred to the patient.
- Enhancement of infection: The therapy might fail for some patients and can result in an enhanced form of the infection.
- Effect on immune system: The antibody administration may end up suppressing the body's natural immune response, leaving a Covid-19 patient vulnerable to subsequent re-infection.

Conclusion:

Plasma therapy's potential as treatment for Covid-19 has already been explored in limited trial improvement in clinical status. With its wide scale and flexible application for other disease treatments, plasma therapy can prove to be a game changer in the future to tackle the global pandemic challenges like COVID-19.

9. How does ball tracking technology work in Cricket? Explain.

Demand of the question:

It expects students to give a clear account of mechanism of ball tracking technology in cricket. It also expects students to put forth its lacunas in short and write improvement as way forward.

Introduction:

Ball tracking technology is in numerous sports such as cricket, tennis, Gaelic football, badminton, hurling, rugby union, association football and volleyball, to visually track the trajectory of the ball and display a profile of its statistically most likely path as a moving image.

Body:

Working mechanism of ball tracking technology:

- Ball tracking technologies work on the principles of triangulation using visual images and timing data provided by a number of high-speed video cameras located at different locations and angles around the area of play.
- The system rapidly processes the video feeds from the cameras and ball tracker.
- A data store contains a predefined model of the playing area and includes data on the rules of the game.
- In each frame sent from each camera, the system identifies the group of pixels which corresponds to the image of the ball. It then calculates for each frame the position of the ball by comparing its position on at least two of the physically separate cameras at the same instant in time.
- A succession of frames builds up a record of the path along which the ball has travelled. It also "predicts" the future flight path of the ball and where it will interact with any of the playing area features already programmed into the database.
- The system can also interpret these interactions to decide infringements of the rules of the game.
- The system generates a graphic image of the ball path and playing area, which means that information can be provided to judges, television viewers or coaching staff in near real-time.
- The tracking system is combined with a back-end database and archiving capabilities so that it is possible to extract and analyse trends and statistics about individual players, games, ball-to-ball comparisons, etc.
- Its major use in cricket broadcasting is in analysing leg before wicket decisions, where the likely path of the ball can be projected forward, through the batsman's legs, to see if it would have hit the stumps.

Benefits of ball tracking technology in cricket:

- Due to its real-time coverage of bowling speed, the systems are used to show delivery patterns of a bowler's behaviour such as line and length, or swing/turn information.
- It helps the umpire to take the right decision, as one wrong decision can change the fate of game.
- Batsmen also benefit from the analysis of ball tracking technology, as a record can be brought up of the deliveries from which a batsman scored.
- Information such as the exact spot where the ball pitches or speed of the ball from the bowler's hand (to gauge batsman reaction time) can also help in post-match analysis.

Lacunas of ball tracking technology:

- In the 2007 Wimbledon Championships a shot that appeared to be out, was called by Hawk-Eye as in by 1 mm, a distance smaller than the advertised margin of error of 3.6 mm. Hence, it has received criticism on the ground of accuracy.
- Another doubt raise is that, that ball tracking technology may struggle with predicting the trajectory of a cricket ball after bouncing; the time between a

ball bouncing and striking the batsman may be too short to generate the three frames (at least) needed to plot a curve accurately.

Conclusion:

The large scale developments in technology and their wide scale application have proved to be beneficial to ease the living of people. The ball tracking like technologies have helped to have a fair and unbiased decision making in sports game, hence, if the newly emerged technologies if implemented in the sports, can develop the sports to its true spirit of a fair play game.

10. What are the institutional and legal arrangements in place to address pandemics in India? How have the panned out during COVID-19? Examine.

Demand of the question:

It expects students to write a about the institutional and legal arrangements in place to address pandemics in India. It also expects how these arrangements have resulted out during COVID-19.

Introduction:

The COVID-19 pandemic has shut businesses, disrupted supply chains ,and caused unprecedented loss to economy. Indian institutions and the foresighted legal arrangements are tackling this pandemic at breakneck speed as a result India's death rate is low as compared to that of the developed countries.

Body:

Institutional and legal arrangements in place to address pandemics in India:

- Institutional arrangement like All India institutes of medical sciences are a group of autonomous government public medical colleges of higher education.
- These institutions have a pivotal role to play during pandemic as they provide the skilled workforce and necessary expertise during the pandemics.
- The National Institute of Virology, Pune is an Indian virology research institute. It is one of the major Institutes of the Indian Council of Medical Research (ICMR). As it is a virus research institute it provide the necessary research and development during pandemics.
- The Indian Council of Medical Research (ICMR), the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest and largest medical research bodies in the world.
- Ministry of health and family welfare and Ministry of Home affairs play a pivotal role during pandemic like crisis situations through the necessary guidelines, instructions, travel advisories for migrants and COVID-19 warriors etc.
- Reserve bank of India, Ministry of commerce and Industry, University grants commission, All India Council for Technical Education, Ministry of Human resource development also play a pivotal role to tackle the disruption of the economy and educational curriculum.

- The lockdown has been carried out by State governments and district authorities on the directions of the Union Ministry of Home Affairs under the Disaster Management Act of 2005, which was intended "to provide for the effective management of disasters and for matters connected therewith or incidental thereto".
- Under the Act, the National Disaster Management Authority (NDMA) was set up under the leadership of the Prime Minister, and the National Executive Committee (NEA) was chaired by the Home Secretary.
- The State governments and authorities exercised powers under the Epidemic Diseases Act of 1897 to issue necessary directions.
- Section 144 of the Criminal Procedure Code in public places authorizes the Executive Magistrate of any state or territory to issue an order to prohibit the assembly of four or more people in an area.
- The Epidemic Diseases Act, 1897 is meant for containment of epidemics by providing special powers that are required for the implementation of containment measures to control the spread of the disease.
- The Essential Services Maintenance Act is an act of Parliament of India which was established to ensure the delivery of certain services, which if obstructed would affect the normal life of the people.

Cumulatively, these institutions and legal frameworks have acted in consonance to contain the spread of pandemic and panned out in following way:

- The National Institute of Virology, Pune Isolated the 11 strains of SARS-COV-2 virus and helped India becoming the fifth country in world to isolate the strain.
- The ICMR made major scientific progress during COVID-19 as it developed PCR tests, 5 vaccines have gone for human trial.
- Council of Scientific and Industrial Research (CSIR) has initiated a randomised clinical trial to reduce mortality in critical COVID-9 patients through drug efficacy evaluation.
- Relief measures announced by Reserve Bank of India e.g. reduction in repo rate, increasing loan moratorium. Also some tax relief measures are also announced by the finance ministry. Which benefitted the vulnerable section of population.
- The Finance Minister also announced medical insurance cover of Rs 5 million per healthcare worker. About 2 million health services and ancillary workers will benefit from such insurance scheme.
- NDMA and NEA issued orders directing the Union Ministries, State governments and authorities to take effective measures to prevent the spread of COVID-19, and laid out guidelines illustrating which establishments would be closed and which services suspended during the lockdown period.
- Under the Epidemic disease act, the Health and Family Welfare Department of Tamil Nadu issued a government order, to impose social distancing and isolation measures which directed "suspected cases and foreign returnees" to remain "under strict home quarantine" and people "to stay at home and

come out only for accessing basic and essential services and strictly follow social distancing norms".

- Due to the pandemic federalism in India also got much needed boost.

Worryingly, a consolidated, pro-active policy approach is absent. In fact, there has been ad hoc and reactive rule-making, as seen in the way migrant workers have been treated.

- The invoking of the Disaster Management Act has allowed the Union government to communicate seamlessly with the States. However, serious questions remain whether the Act was originally intended to or is sufficiently capable of addressing the threat of a pandemic.
- Also, the use of the archaic Epidemic Diseases Act reveals the lack of requisite diligence and responsiveness of government authorities in providing novel and innovative policy solutions to address a 21st century problem.
- Another serious failing is that any violation of the orders passed would be prosecutable under Section 188 of Indian Penal Code, a very ineffective and broad provision dealing with disobedience of an order issued by a public servant.

In contrast, the U.K. enacted the Coronavirus Act, 2020, which is a comprehensive legislation dealing with all issues connected with COVID-19 including emergency registration of healthcare professionals, temporary closure of educational institutions, audio-visual facilities for criminal proceedings, powers to restrict gatherings, and financial assistance to industry.

Conclusion:

In past instance and present too, these institutional and legal measure have proved to be effective while dealing with the pandemic like situations. However, there are some 21st century challenges posed by the evolving global architecture fell vulnerable while dealing with the COVID-19 pandemic. Hence, necessary steps needs to be taken so a comprehensive approach can be followed to tackle the COVID-19 like situations in future and better health for all can be assured.

11. How is biodiversity loss associated with infrastructure development? How does environmental impact assessment help in reconciling the developmental needs with conservation imperatives? Explain.

Demand of the question:

It expects students to write about negative impact of infrastructure development as a biodiversity loss. It also expects students to write about how the Environment impact assessment can help to reconcile the developmental needs with conservation imperatives.

Introduction:

The loss of biodiversity due to large scale infrastructural developmental programmes has wide scale implications. In this scenario, Environmental impact assessment which is a process of evaluating the likely environmental impacts of a proposed

project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse can prove to be useful to conserve the biodiversity.

Body:

Humans have evolved, grown and thrived, in nature. Modern human society needs the resources of nature to thrive. The infrastructural developments impact the biodiversity in various ways, hence biodiversity loss is associated with the infrastructural development as follows:

- Increasing land demand: Due to the growing human population, wetlands are being made dry through landfills, as the demand for land increases. Natural forests are cleared for industry, agriculture, dams, habitation, recreational sports, etc.
- The most dramatic examples of habitat loss come from tropical rain forests. Once covering more than 14 per cent of the earth's land surface, these rain forests now cover no more than 6 per cent. They are being destroyed fast.
- The Amazon rain forest (it is so huge that it is called the 'lungs of the planet') harbouring probably millions of species is being cut and cleared for cultivating soya beans or for conversion to grasslands for raising beef cattle.
- Man-Animal Conflict: It refers to the interaction between wild animals and people and the resultant negative impact on people or their resources, or wild animals or their habitat.
- It occurs when wildlife needs overlap with those of human populations, creating costs to residents and wild animals.
- Land use transformation: Industrialization, infrastructure development, commercial farming etc. leads to species habitat loss, degradation and fragmentation due to above-mentioned reasons. In turn reducing their survival chances hence loss of biodiversity.
- Increasing livestock population in the livestock sector is encroaching on the necessary fodder for wild herbivores and led to competitive exclusion of wild herbivores.

In this way biodiversity loss is associated with the infrastructural development. However, Environmental Impact Assessment (EIA) process can help to reduce the scale of negative impact of infrastructural development on biodiversity los in following ways:

- UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making.
- It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.
- Thus it ensures that there will be minimal negative impact on the surrounding once an infrastructural development programme is implemented. It also ensures the conservation of biodiversity in sustainable way.

- EIA involves certain processes such as screening, scoping, collection of baseline data, risk assessment etc. which help to analyse scale of impact and its probable solutions.
- EIA links environment with development for environmentally safe and sustainable development.
- EIA provides a cost effective method to eliminate or minimize the adverse impact of developmental projects.
- EIA enables the decision makers to analyse the effect of developmental activities on the environment well before the developmental project is implemented.
- EIA encourages the adaptation of mitigation strategies in the developmental plan.
- EIA makes sure that the developmental plan is environmentally sound and within the limits of the capacity of assimilation and regeneration of the ecosystem.

Hence, in these ways Environmental Impact Assessment help in reconciling the developmental needs with conservation imperatives.

Conclusion:

With its pre-development assessment approach EIA could prove to be a game changer for developmental needs and conservation imperatives. EIA's implementation in true letter and spirit can surely help to cope up with infrastructural development while conserving the wonderful biodiversity of our planet earth.

12. There are certain stretches of the Himalayan rivers that are extremely polluted and hazardous for human consumption. Can you identify those stretches? What makes these stretches so polluted? Examine.

Demand of the question:

It expects students to identify and write about those stretches of Himalayan rivers that are extremely polluted and hazardous for human consumption. It also expects students to state the reasons for the pollution of these river stretches with possible applicable solutions and government initiatives.

Introduction:

The larger Himalayan region is known as the water tower of Asia. Many rivers such as the Ganga, Brahmaputra, Barak (in the Meghna basin) and Indus originate in this region. However, water quality index has placed India at 120th place amongst 122 countries due to 70% of its river water is polluted.

Body:

Stretches of river which are extremely polluted and hazardous for human consumption:

- The Ganga river holds deep religious significance in India. But the alarming levels of pollutants and sewage waste that are discharged into it every day by

over 1100 industrial units and several towns situated on its banks, have made it one of the most polluted rivers in the world.

- A recent report by the Central Pollution Control Board declared that the Ganga water is unfit for bathing, let alone drinking directly.
- The 2900-km long river and Assam's lifeline, the Brahmaputra, today is reeling under water pollution in the form of sewage waste and oil discharge.
- Rapid urbanisation and lack of efficient waste disposal systems have now rendered it lifeless. A recent report states that at least 28 kms of the river stretch in Assam is heavily polluted.
- The Yamuna rivers stretch in the Delhi NCR region, which was once the lifeline of Delhi and one of India's most sacred rivers, has also been reduced to being one of the most polluted rivers in the world.
- Once a major water source for Lucknow, the Gomti rivers stretch in lucknow and nearby region and its marine life is almost dead now, consumed by the high pH levels in it.
- Flooding during monsoons worsens Himalyan rivers pollution problem, as it washes and moves solid waste and contaminated soils into its rivers and wetlands.

Water pollution is a major environmental issue in India. Due to the large scale industrial development, long term effects of green evolution and other soci-economic reasons, the pollution of Himalayan rivers forms a centre of debate. The following are the reasons for the pollution of these stretches of river:

- Untreated Sewage: A 2007 study found that discharge of untreated sewage is the single most important source of pollution of Himalayan rivers water in India. There is a large gap between generation and treatment of domestic waste water in India. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained.
- A 1995 report claimed 114 Indian cities were dumping untreated sewage and partially cremated bodies directly into the Ganges River. Lack of toilets and sanitation facilities causes open defecation in rural and urban pill areas of India, like many developing countries.
- Organic matter: In 2010 the water quality monitoring found almost all Himalayan rivers with high levels of BOD (a measure of pollution with organic matter). For instance, BOD in river Yamuna canal (247), river Yamuna at Delhi (70).
- Coliform levels: Rivers Yamuna, Ganga, Gomti, Ghaghara River, are amongst the other most coliform polluted water bodies in India. For context, coliform must be below 104 MPN/100 ml, preferably absent from water for it to be considered safe for general human use, and for irrigation where coliform may cause disease outbreak from contaminated-water in agriculture.
- Heavy untreated water effluents are directly send in to river without treatment is also one of the aggravating factor.
- Recently, the Central Water Commission (CWC) has reported that the samples from two-thirds of the water quality stations spanning India's major

rivers are contaminated by one or more heavy metals, exceeding safe limits set by the Bureau of Indian Standards.

Water conservation in India is gaining pace. The Ganga rejuvenation efforts by the union government, the Yamuna clean up are some of the government initiated efforts.

- The Union government recently formed a new Jal Shakti (water) ministry, which aims at tackling water issues with a holistic and integrated perspective on the subject.
- The government has given importance to the problem of river pollution with the establishment of a National River Conservation Authority chaired by the Prime Minister. The river conservation programme was initiated with the Ganga Action Plan (GAP) in the year 1985.
- Namami Gange Programme', is an Integrated Conservation Mission, approved as 'Flagship Programme' by the Union Government to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga.
- Citizen led initiatives to keep clean river will also be one of the most effective ways. e.g. Every weekend, a group of professionals - doctors, engineers, and scientists - assemble at the banks of Yamuna river near the ITO, armed with brooms and shovels for cleaning up the waste strewn along the ghat.
- A larger perspective of pollution needs to be taken. Encouraging farmers to move towards organic farming, failing which they must be encouraged to use biological pesticides or safer chemical pesticides.
- One way to deal with the problem will be to permit water quality rights of citizens. State governments are responsible for implementing water pollution control laws.

Conclusion:

Rivers are considered sacred in India. The large scale urbanization and impacts of unscientific agriculture and biodiversity loss led to worsen the problem of river water pollution in India. If sustained efforts and decentralised approach is taken then it will surely help to prevent the pollution of this precious natural resource and achieve the target of safe drinking water for all by 2024.

13. Why is emotional intelligence crucial to address mental health issues during the ongoing pandemic? Illustrate with the help of suitable examples.

Demand of the question:

It expects students to write the importance of emotional intelligence to address mental health issues especially focussing on the impact of ongoing pandemic on mental health with relevant examples.

Introduction:

The covid-19 pandemic is leaving an unprecedented impact on the mental health of people. With the increasing number of cases of suicides, domestic violence on

women the mental health issue came to forefront. Emotional Intelligence due to its multitude of positive way of action can play a pivotal role to address mental health issues during the ongoing pandemic.

Body:

Emotional intelligence refers to 'the ability to identify one's own emotions and those of others, harness and apply them to tasks, and to regulate and manage them'. Due to its direct co-relation with the mental health of the people, emotional Intelligence is crucial to address mental health issues during the ongoing pandemic in following ways:

Mental Health issues during the ongoing pandemic:

- Fear of exposure to disease: Children, Old age people and those who are fighting with long term illness, this section of population is at more risk of exposure.
- Fear and worry about one's own health and the health of their loved ones, created an atmosphere of fear in the family which leads to have a negative impact on the productivity of persons in the family.
- Anxiety and threat to life: Health care professionals and frontline workers are the first line of defence and hence, fear to get infected, fear of loss of life overpowers their thoughts if their level of emotional intelligence is not that high.
- Ethical question of whether to save my own life or serve others: Essential workers such as employees in food sector, vegetable vendors, medical shop owners etc. might get depressed due to the fact that when the whole world is sitting inside their home and making sure that they and their loved ones are safe during pandemic, why I should be the only one who should take risk and work.
- Suicides of students and jobless people: In Jalandhar district of Punjab, 80 suicides are reported till date during pandemic-induced lockdown.
- Feeling of helplessness and vulnerable: The pandemic has exposed the harsh realities of rich-poor gap and extent of government facilities across the population. In this pandemic situation where people have no source of income due to lockdown their mental state deteriorated while addressing the question of from where to get money to eat.
- Also In a tragic incident, 16-year-old class 10 student allegedly committed suicide after she failed to attend online classes in the absence of a computer or a Smartphone.
- Deterioration of Mental health of family: The UN has described the worldwide increase in domestic abuse as a "shadow pandemic" alongside Covid-19. The cases of domestic violence have increased by 20% during the lockdown, as many people are trapped at home with their abuser.
- The rise in cases of domestic violence is due to the increased presence of the husbands and children in home. As it results in more work demand on women, women if fails to carry out a responsibility in home, faced physical

and mental abuse inside the home. Hence, It resulted in the deterioration of mental health of whole family.

- COVID-19 positive patients mental health: The scale of impact on the mental health of the people who are getting treatment for COVID-19 is horrible. As many of them have faced social ostracization, feeling of loneliness overpowered them, and felt helpless in this situation.
- Lack of motivation: As a considerable section of the population lost jobs, and sat idle at home they lost their motivation to do better in life.

The COVID-19 pandemic induced lockdown has posed a great challenge in terms of different mental health issues. However, emotionally intelligent society can respond in proper way to these mental health issues of pandemic in following ways :

- Emotional intelligence in a way helps to tackle fear of exposure to disease by inducing right thinking, and supplementing the right course of action such as not leaving the home for unnecessary things or inculcating right habit of washing the hands properly to tackle the pandemics challenge.
- Social awareness: Emotional intelligence help the frontline workers and healthcare providers to look at this pandemic as an opportunity for them to help every person who might or might not get infection of covid-19.
- It will also help to have a positive impact on the health of patients who are treated by these health care workers.
- Motivation: Having a strong emotional intelligence to face the situation and get a desired output if imbibed, it will help to have a strong society with good character.
- Emotional intelligence due to its ability to perceive emotions in oneself and others accurately, can help to reduce the domestic violence.
- The mental health of a person also plays a prominent role in recovery of an ill body. Hence, if a patient whose emotional intelligence is strong, he/she will not fall to the negative thoughts, and in turn they will respond the treatment well and will recover from the infection earliest.
- Self awareness: Emotional intelligence gives a greater awareness of self. So an essential service provider if understands that by doing his/her job, duty he/she is helping the people to tackle this pandemic then it will surely instil sense of doing duty for betterment of others.

Conclusion:

Emotional intelligence due to its characteristic to manage emotions so as to attain specific goals has potential to be more useful to reduce the impact of pandemic. Having a strong emotional intelligence in society will help to respond to the upcoming pandemic threats in future in right manner and tackle them successfully.

14. Why is rote learning not a good thing? Do you think children should be made emotionally aware and be imported with emotional intelligence through school education? Substantiate.

Demand of the question:

It expects students to put forth their views on why rote learning is not a good thing. It also asks students to write about whether children should be made emotionally aware and be imported with emotional intelligence through school education.

Introduction:

Modern education in India is often criticised for being based on rote learning rather than problem solving. Preschool for Child Rights a child rights NGO states that creativity is not encouraged or is considered as a form of entertainment in most institutions and preference is given to rote learning to gain marks. Emotional intelligence can help to put aside the rote learning and develop the creativity in students due to its prominent characteristics.

Body:

Problems of rote learning:

- Promote Convergent Thinking: Rote learning trains a mind to solve problems with a single answer which is right, as opposed to meaningful thinking which allows the mind to reach different solutions.
- Deny Exploring Different Options: A teacher presenting information to students in a manner that doesn't allow or encourage questioning and divergent thinking is encouraging rote learning.
- Makes People Passive Learners: Rote learners never learn to question and explore. Their minds are trained to receive information and recall it at the right time. These people develop their listening and writing skills but not their thinking and questioning skills. Taken out of their comfort zone, passive learners will be quiet and disinterested in the proceedings around them.
- Not Allowing Connections to Form: Since rote learning teaches just one answer, people who learn like this cannot make mental connections between the knowledge they already have, and reaching a solution to the problem they are working on.
- Not Promoting Understanding: Rote can be considered a "quick-fix" solution to gaining knowledge. It is the lazy person's answer to teaching and learning. The teacher will inform the students of the answer to a particular problem without really explaining how the answer was reached or encouraging the students to find the answer for themselves.
- It Is Geared Towards Scoring: Learning should be something that promotes understanding and bases knowledge gained on how problems are approached and solved. In the rote learning method, the emphasis is on getting a higher score.
- Discourage Social Skills and sensitivity: Group studies, research and other factors that make up meaningful learning encourage socialization and learning from peers. Rote learning has the opposite effect because information has already been transferred by a single source, and it is the only one which is acceptable. This discourages discussions and further learning from social interactions.

It is very important to recognize that rote learning is not the most effective way to learn most things. Meaningful learning, where the learner is taught to question, think and arrive at a solution from a different angle is how true learning takes place. Emotional intelligence due to its characteristics can help a student to have meaningful learning in following ways:

- Self-awareness ability of emotionally intelligent student allows him/her to know which subjects are easy and hard. How to handle these subjects, which approach should be followed, what to learn from it and what are their respective applications.
- Develop Empathy: Having empathy is critical to be a good person in society. A student who knows the plight of the weaker sections of society can think to eliminate the plight of workers in more realistic way rather than just rote learning the problems and solutions.
- Management of stressful situations: Emotional Intelligence helps a student to respond to critical situation in life in right way. e.g. Performing well in exam induces stress in students, and emotionally intelligent student can tackle this stress like situation neatly.
- Motivation: Emotionally intelligent students can develop themselves in to better persons as the meaningful learning can motivate the students to have larger goals in life.
- Ability to Bounce Back from Adversity: Emotional Intelligence help students to bounce back quickly after a setback in exam. e.g. Students suicides can be stopped by teaching emotional intelligence and by making them emotionally aware.
- Social awareness: An emotionally aware student can understand the feelings of student from poor family who is not able to buy new clothes for school. Social awareness due to this will help a student to look for betterment of society in future.

Conclusion:

Emotional intelligence in the student is critical for their performance and learning in school curriculum. It will not just help to develop a good personality of student but at the same time it will also ensure an emotionally well aware and intelligent society which looks forward for growth and development of a nation.

15. In dealing with religious contentious issues, emotional intelligence plays an important role. Comment.

Demand of the question:

It expects students to write both aspects of whether emotional intelligence's plays a role while dealing with religious contentious issues or not.

Introduction:

Religious contentious issues arise over the teaching of science, certain religious practices, and the depiction of religion or religious figures in culture. In the age of

science where a proof of things is essential to prove its existence, some religious belief and practises due to their inhuman nature emphasise the role of emotional intelligence of a person.

Body:

Emotional intelligence (EI) refers to 'the ability to identify one's own emotions and those of others, harness and apply them to tasks, and to regulate and manage them'. Due to its direct relation with the emotions of the people, emotional Intelligence is crucial while dealing with religious contentious issues in following ways:

- Develops Compassion: EI is the ability to recognize our own and other people's emotions; Hence, when people of different faiths and belief fights over religious contentious issues EI helps a person to talk-decide and act rationally.
- EI helps to control negative emotions, it in turn help to reduce the enmity between the people over the contentious religious issues. It also helps a person to protect his/her own religion and respect the other ones too.
- As Lord Buddha said "Holding on to anger is like grasping a hot coal with the intent of throwing it at someone else: you are the one who gets burned."
- Helps to manage relations: As social awareness gets developed due to emotional intelligence, it promotes the felling of compassion and empathy between the people in turn reducing the contention in religious issues.
- Strong decision making: Self awareness about ones choices, belief, nature helps a person to act decisively if any threat to society occurs due to his/her act of religious practise. it may result in people leaving that religious practise and adopting a modern approach. e.g. Act of Sati was opposed by intellectuals like Raja Rammohan Roy.
- Conflict resolution: Emotional Intelligence help leaders to influence and mentor others and help in resolving the religious conflicts effectively.
- Ability to Bounce Back from trauma: Emotional Intelligence help people and leaders to bounce back quickly after a conflict which resulted in massacre of people due to religious contentious issues.
- For instance, Killing of Jews over ethno religious issue traumatised many people, but Victor frankle a psychologist and survivor of massacre helped many people to recover from the shock of massacre due to his emotional intelligence.

However sometimes this emotional intelligence is used by some miscreants and it proves to be a double edged sword.

- A leader who understands mass psychology can utilise any opportunity in the society to incite violence over the issue of religion. As he/she may play with emotions, religious belief of common people who are not emotionally aware and may spread religious contention in society by inciting them against the people of other religions.
- A person who understands that many people who have religious belief they are bounded by the hope that god will do better with them if they follow certain religious practises.

- Hence, if an emotionally intelligent person if uses his emotional intelligence in other way round and plunders the common people monetarily in the name of religion. Then it proves to be harmful to the society.
- This in turn would not resolve the religious contentious issues but will aggravate the religious contentious issues.

Conclusion:

Hence, inculcating emotional intelligence in the people for religious practise plays an important role by supplementing the rational decision making. It also ensure harmony in the society and promotes respect for other religions in people which prospects better future of society at large.