Programming Interview

Question 1:

Using your own understanding write a 700-word essay on Biological Robustness and Fragility.

-In this essay define what is biological robustness and fragility. -Give 1 example of robustness and 1 for fragility.
-Explain why biological robustness is integral part of survival.
-What are the consequences of fragility and how one could avoid it? -Provide citations, where necessary, to justify your statements.

Answer:

Robustness is a capability of scientific process or biological system to maintain their functions by facing and withstanding different variations and disturbances caused by the environment without letting down the biological system.
The robustness depends on the following conditions like temperature, PH and nutrient availability and many more .
The best example for this would be The process of homeostasis. In homeostasis the body tends to maintain an stable internal environment enduring the hardships given by the external environment. To explain this scenario lets take temperature , our normal body temperature is 37 degree Celsius , to maintain this our body withstands the external environment i.e. if it is hot or cold .

Fragility, this term is derived from the term fragile i.e. easily breakable, delicate or vulnerable . As we are talking in biological systems ,let's take vulnerability.
The biological fragility implies the living organisms possibility of nearing to an attack or is vulnerable to variations and disturbances from the environment like physical, chemical and biological stressors , internally susceptible to conditions like infections, diseases and injuries . In the end this all leads to destruction . In this condition the biological system that is the living organisms have reduced capability to recover .
The factors that contribute to fragility is genetics, age, environmental factors and lifestyle choices.
The best example for this is disease susceptibility , we all know about Covid 19 the recent disease which spread swiftly all over the world and had no known effective treatment, many were highly affected due to easily spread nature , this tells about the fragility .
From this Biological robustness and biological fragility are in opposite poles , Robustness has a withstand power whereas fragility doesn't have that and tends to be easily exposed.

Now lets see how robustness helps in integral part of survival.
Robustness is an integral part of survival , because this world is unpredictable ,survival happens with fluctuating conditions like temperature, availability of food, water and air and lastly exposure to environment ,predators and diseases.
If robustness is lacking, organisms would not be able to withstand the temperature and externally occurring physical intrusions. Let's see an example on how robustness helps in an animals living, polar bears that live in artic climate adapts behavioural and physically to bare the cold climate with the help of insulating furs and blubber which gives warmth for the cold nature it is experiencing .

Now we saw animals living in cold climate , like this animals living in hot climates will have some other physical body changes and behavioural changes which will give them some coldness to get some relief from that hotness . For example camels living in dessert will have bodily changes like big ears , hump with stored water , use of light coloured coats , this all is to get some cold air in a hot climate .
This is something which we do not create , this beaty of nature , this occurs due to the changes occurring in earth during rotation and revolution. This robustness is the mechanism or an important vow for a person's long and healthy life .

Consequences of fragility:

Now let's see the consequences faced by the organisms due to fragility , Fragility is not like robustness , robustness always tend to keep for a long time and act when needed , but fragility is easy breakdown , it cannot keep anything to itself it bursts out easily.
decrease in ability to cope with environmental changes and temperature, this leads to extinction , pollution and habitat loss ,more susceptibility to diseases i.e. easily getting attracted to infections and ending up in fever and illness. Reduced physical and mental health , stopped or regressed growth and development , success towards reproductive trial gets decreased .

To avoid these consequences due to fragility just reverse whatever is given above, promote healthy living by regular exercise , rest and balanced diet , Environmental protection, Disease prevention with the example of our latest Covid 19 disease which is under control due to the vaccination it is just being risk reducer but not an 100 percent cure , keeping our genetic diversity within a range enables increased flexibility to stressors. Introducing monitory checks for instruments to detect disasters in order to save people from moving them to another place , for example earthquake which can be detected by Richter scale tells us the risk of the earthquake and allows us to make easier decision on saving people.

REFRENCES:

1. Fragility and susceptibility to diseaaes Curtis D. Klaassen, et al (2013), https://www.sciencedirect.com/science/article/pii/B9780123864543000605

2. Decreased Reproductive success: Richard E .Ricklefs,et al (2010) , https://www.sciencedirect.com/science/article/pii/S0169534710001868

3. Disease Prevention and Control Guidelines , centres for disease control and prevention(2021)
https://www.cdc.gov/about/default.htm

4. Genetic Diversity and Adaptationin plants and animals , Susan J.Mazer, et al (2018)
https://www.sciencedirect.com/science/article/pii/S006525041730036X

5. Monitoring and early warning systems for climate sensitive diseases , World health organisation.2019, https://www.who.int/globalchange/publications/monitoring-early - warning systems-climate -sensitive-diseases,