Group I

Evidence from the Natufian culture suggests that in some places the

- a) transition to permanent dwellings predated the transition to agriculture
- b) transition to agriculture predated the transition to permanent dwellings
- c) transition to agriculture and the transition to permanent dwellings occurred at the same time
- d) I do not wish to choose any of the options

According to the law of diminishing marginal productivity, total production

- a) Increases if the quantity of an input is increased and the remaining inputs remain fixed
- b) Stagnates if the quantity of an input is increased and the remaining inputs remain fixed
- c) Diminishes if the quantity of an input is increased and the remaining inputs remain fixed
- d) All previous answers
- e) I do not wish to choose any of the options

The printing press was

- a) Reluctantly adopted by the Ottoman Empire
- b) Eagerly adopted by the Ottoman Empire
- c) Never adopted by the Ottoman Empire
- d) I do not want to choose any of the options

Tanna Island used to be the home of

- a) the Cargo Cult
- b) an ancient civilisation extinct due to overuse of resources
- c) a developed civilisation contemporary to Ancient Egypt
- d) I do not want to choose any of the options

Group II

II.1) The Neolithic Revolution stimulated biological adaptations of humans to their new environments. Please exemplify and discuss.

The Neolithic Revolution corresponded to the human transition from a hunting, gathering and nomadic way of living to an agricultural, herding and sedentary one. Several consequences arose from this process, among them the increase in the food supply, due to the cultivation of plants and the raising of cattle, rather than the simple gathering of wild plants and hunting of animals. Such an increase allowed for larger and denser populations in villages, towns and cities. It also allowed for more consumption of animal goods, as animals were now domesticated and nurtured, living together with humans, rather than simply being chased and killed.

This led to human biological adaptations as a response to the new environments created by agriculture and herding, showing a certain co-evolution of culture and genetics. A clear adaptation of such a type is visible in a phenomenon associated with the domestication of animals: lactase persistence. Lactase is an enzyme that is essential for the digestion of lactose – a sugar found in dairy products. Like other mammals, prehistoric humans only generated lactase in infancy. But mutations that emerged in Western Asia, Europe and East Africa as early as 6,000-10,000 years ago permitted the persistence of lactase generation and thus milk consumption beyond infancy. Specifically, among the societies of cattle herders and shepherds that inhabited these regions, adults who happened to be able to produce lactase could use their animals as a portable and renewable source of food. The evolutionary advantage this conferred led to greater prevalence of such a trait in these populations over time. As a result, over 90 per cent of adults in the UK and Scandinavia are lactose-tolerant, whereas the proportion plummets to under 10 per cent in East Asia, where the economy was not traditionally based on sheep and cattle.

Similar mutations enabled the digestion of starch, allowing humans to integrate bread into their diets. And there were further adaptations not related with diet. The rise in population density and the domestication of animals led to increased humans' exposure to viruses and bacteria existing in animals that then spread to human populations. Initial exposure led to serious epidemics that killed vast numbers of people, but after repeated exposure to the infectious agents the populations developed immunity to these diseases, resisting their effects in a sustained manner – some people suggest, for instance, that innate immunity to malaria in Europe may have resulted from a process of the sort.

II.2) Please comment Oded Galor's following sentence: "Child labour was neither an innovation of the Industrial Revolution nor a significant factor in the industrialisation process. Nor, in fact, was child labour eradicated as a result of the legislation against it".

As a matter of fact, child labour did not start with the Industrial Revolution. It has been an intrinsic element of human societies throughout history, as the challenges of a subsistence existence demanded that young children performed a series of hard labour tasks. The initial stages of the Industrial Revolution in Britain did not change the situation, and during the period child labour was especially prevalent in textile factories where the children's delicate hands were particularly advantageous to unclog the machines. But rapid technological change and its impact on the demand for educated labour gradually reduced the profitability of child labour for parents as well as for industrialists in two ways. First, the new machines typical of the Industrial Revolution reduced the relative productivity of children by automating the simpler tasks that they were capable of, thus magnifying the difference between the earning capacity of parents and children and reducing the parental benefit from child labour. Second, the rise of the importance of human capital in the production process induced parents to invest their children's time and energy in education rather than work and led industrialists (keen for their workforce to be better equipped with the relevant skills) to support laws which limited and ultimately prohibited child labour.

Investing in the education and the skills of the workforce became increasingly more important to industrialists, as the simpler tasks were now performed by machines while at the same time skills were needed for more complex ones. Industrialists were, however, initially reluctant to fund the education of their potential workforce, as there was no guarantee that these workers would not take their newly acquired skills and find employment elsewhere. The solution for such a coordination problem was found when industrialists began lobbying the British Government for the public provision of education and the Government responded positively by putting in place a universal and free system of primary education in the 1870s, making afterwards education compulsory for children in the 1880s.

Legislation only played a limited role in eradicating child labour in Britain. While it was no doubt a contributing factor, the first anti-child labour laws were enacted when child labour was already on the wane. Much more important was the schooling of a growing number of children, a consequence of the processes highlighted above. Progressively, similar processes started spreading to other earlier industrialising countries, leading to the virtual disappearance of child labour there. **II.3)** An unassuming fly is responsible for the absence of cattle in a part of the planet. Which fly, which effect did it have on cattle and which part of the world? What consequences arose for that region due to the absence of cattle?

The fly mentioned in the question is the tsetse fly, which thrives in the humidity and warm temperatures of Central Africa. The tsetse fly feeds on the blood of humans and animals and is the main vector of the deadly parasite that causes sleeping sickness in humans, as well as similar diseases in goats, sheep, pigs, horses, and other livestock. The parasite kills some of the animals it infects and diminishes the milk production and energies of those that survive, making it impractical for societies to rely on them. The presence of the tsetse fly had a dramatic adverse effect on the adoption of animal husbandry and livestock-based farming techniques such as ploughing on the human communities living in its natural habitat.

The presence of the tsetse fly has had as a consequence that a wide strip of land stretching from the east coast of Africa to the west coast, hemmed in by the Sahara Desert to the north and the Kalahari Desert to the south is essentially devoid of livestock. We must understand that livestock, before the Industrial Revolution was the basis of farming. Animals served not only as a vital source of food but provided fibre for textiles and were also used as means of transportation. In Eurasia, cattle were integral to the Neolithic Revolution. In South America's Andes mountains, llamas and alpacas were beasts of burden as well as sources of wool and meat. In the Arabian, Sahara and Gobi deserts, camels not only bore nomads across the wilderness, but they also provided fur and milk during these journeys, and on the Tibetan mountains, yaks were used for ploughing and transporting cargo as well as for their hair, hides and milk. Livestock enabled societies to boost their agricultural output and consequently to expand their populations and intensify their technological progress.

The absence of cattle in the mentioned region means that it could not benefit from all the advantages listed above. This seems to be one of the central reasons why the residents of Sub-Saharan Africa have not enjoyed the benefits of the same technological advances and political institutions that can be seen in other regions, explaining why it has remained less developed than other nearby regions ever since the transition to agriculture. This is a clear example of the relevance of geographical conditions to explain wealth and poverty around the world.

II.4) The transition to agriculture was entirely rational even though, in moments of crisis, living standards of agricultural communities were lower than those of hunter-gatherer communities. Please comment.

Hunter-gatherers lived longer, consumed a richer diet, worked less intensively and suffered fewer infectious diseases than early agriculturalists and herders. But the practice of hunting and gathering had various problems. The central one was that of sustainability. Growing populations could be sustained with ever improving hunting and gathering techniques, but a point would be reached in which this larger population would put too much pressure on the existing resources. As this happened, a point would be reached where the threat of extinguishing those resources was real. In such cases, hunting-gathering communities could simply collapse.

Such an issue was particularly severe in regions that ancient humans prior to *Homo sapiens* had never settled. In those regions the local animals had not been able to adapt to the human threat. In Oceania or the Americas, the arrival of *Homo sapiens* with their advanced weapons led to such a boom in hunting that it soon brought most large mammals to extinction, forcing the growing number of tribes to compete for resources that were rapidly dwindling. An extreme example of civilisational collapse was that of the isolated Polynesian tribes that settled Easter Island. In a matter of a few centuries what used to be a prosperous civilisation simply collapsed.

Hunter-gatherer societies in the Fertile Crescent experienced comparable pressure nearly 12,000 years ago. Population growth supported by food abundance and technological improvements prompted a gradual decline in per capita food availability from hunting and gathering until their temporarily enhanced living standards reverted towards subsistence. However, the particular biodiversity of the Fertile Crescent with its abundance of domesticable species of plants and animals granted those societies an alternative mode of subsistence: adopting agriculture and herding. Farming was a safer strategy of food production, despite being associated with inferior diet quality, than the richer but less predictable and increasingly scarcer one of hunting and gathering.

The viability of reliance on agriculture in the Fertile Crescent helped avert the ecological crisis that destroyed the Easter Island civilisation, allowing the region to sustain a significantly larger population. When agricultural crises happened, they did not mean collapse but simply reversal to a lower level of income per capita. While hunting-gathering societies had higher living standards than agricultural societies in prosperous moments, the latter would however not collapse in moments of crisis, contrary to hunting-gathering ones. This is what explains the rationality of the transition to agriculture and herding, despite the lower living standards associated with them.