

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted from the academic year 2015-16 and thereafter)**  
**SUBJECT CODE: 15EL/PE/EC24**

**M. A. / M.Sc. DEGREE EXAMINATION, APRIL 2019**  
**SECOND SEMESTER**

**COURSE : ELECTIVE**  
**PAPER : ENGLISH FOR COMMUNICATION**  
**TIME : 2 HOURS** **MAX. MARKS: 50**

**I. Write a letter of application for the job of Chief Chef in a reputed hotel in Mumbai, in response to an advertisement in *The Times of India* dated 19 March 2019. (10 marks)**

**II. Write a paragraph on any one of the following. (10 marks)**

1. The impact of campaign speeches on voters
2. The importance of civic sense
3. The responsibility to vote

**III. Read the following passage and summarise it in your own words. (15 marks)**

About 37% of the area of the entire world is agricultural land, a third of which (about 11%) is used for crops. As the population of the world rises to 9.7 billion people in 30 years, the land available for crops will reduce. Thus, there is an immediate need to try and improve the efficiency of food production. Experts predict that agricultural yield must increase by 50% between now and 2050. How to do this is the question facing agricultural scientists across the world.

Plants use sunlight to produce energy for their metabolism and food production. This is referred to as photosynthesis (wherein sunlight is used to make energy-rich molecules needed for producing food molecules). However, the efficiency of photosynthesis is rather low, just about 5% in most land crops. The most efficient land crop with 8% average is sugarcane, which is not all that edible, except for the sugar in it. If only we could increase the efficiency of crops such as wheat, rice and other grains!

One such attempt is through the project RIPE (Realizing Increased Photosynthetic Efficiency), undertaken by a group of scientists at the University of Illinois at Urbana-Champaign in the US, supported by the Bill and Melinda Gates Foundation.

One way of achieving efficiency was displayed in the model plant tobacco where the scientists could “engineer photosynthesis” by increasing the expression of three genes involved in processing light. This increases the tobacco yield by 20%. The team is trying to implement the same genetic engineering method in other plants. One such plant is cassava, also called tapioca, sago or sabudana, whose roots are carbohydrate-rich, and eaten by over half a billion people in Latin America and parts of Africa; indeed it is eaten as staple food in parts of Andhra, Kerala and the hilly areas of Assam. Genetic engineering of this plant was done, just as in tobacco, and appears to work.

Another way that some other scientists are trying is to reduce what is called photorespiration in plants. Here the energy and oxygen produced in the 'light reaction' of photosynthesis is drained by the plant to make "wasteful" products in the 'dark reaction', and not just carbohydrates and other food material, particularly when the plant's leaves close in order to reduce water loss by evaporation. If we can find ways to reduce this photorespiration, edible food yields can go up.

Many of these research attempts involve the introduction of external genes and gene products into food crops, and these are opposed by group of people who do not want genetic engineering and genetically modified plants. This is a curious situation where science finds ways to deal with genes so as to improve yields while sociology opposes it based on worries about safety, as well as monopolistic control of food material through exclusive patents and other factors. A via media solution needs to be found, failing which food production may not increase all to feed the ever growing population of the world.

It is in this context that we need to open our minds and expand our ideas about our food habits. The most efficient use of photosynthesis is actually not by land plants but by micro and macro algae, such as seaweeds. These are the champions, contributing to about 50% of all photosynthesis in the world. Many of them, notably those with dark green, red and brown colour, are edible. They are low-calorie and nutrient-dense food items and eaten by people in most parts of South East Asia – Philippines, Malaysia, Vietnam, Indonesia, China, Korea and Japan, and also in some in coastal Atlantic region. A site called "The definitive guide to edible seaweed" ([foodrepublic.com](http://foodrepublic.com)) gives the details about several of these food items.

About 844 seaweed species are reported from India, a country with a coast line of 7,500 km. Peninsular India from Gujarat all way to Odisha and West Bengal has a coast line of 5,200 km, and Andaman and Nicobar together have a coast line of 2,500 km. Thus, while we have 63% of our land area for crop agriculture, we should not forget this vast coastal area, much of which breeds seaweeds. Research in the area of edible seaweeds in India has been going on for over 40 years. The Central Salt and Marine Chemicals Research Institute (CSMCRI) at Bhavnagar, Gujarat has done pioneering work in the area. Dr Amitava Das, its Director, tells us that over 20 scientists there have been involved for decades in research and propagation of seaweeds as potential food for people, as well as for isolating important chemicals of technological importance and for crop biostimulant purposes.

Professor CRK Reddy, who was at CSMCRI for decades and currently at the Institute for Chemical Technology, Mumbai, has been an active advocate of seaweeds as food. He points out that among the seaweeds found in plenty, *Ulva*, *Pyropia*, *Porphyra* and *Kappaphycus* are edible and that it will be good to cultivate them in a large scale, as is done in countries like Japan. Dr Arockiaraj Johnbosco points out (*Times of India*, 12-1-2016) that, of the 306 seaweeds in the Gulf of Mannar, 252 are edible. Thus India should embark on Mariculture as vigorously as Agriculture, given its 7,500 km-long coastal line. Further, it does not require pesticides, fertilizers and water for irrigation, which is an added advantage.

Seaweeds are rich sources of vitamins A and C, and minerals such as Ca, Mg, Zn, Se and Fe. They also have a high level of vegetable proteins and omega 3 and 6

fatty acids. Best of all, they are vegetarian, indeed vegan, and do not have any fishy smell. For all those who worry about this “new” introduction, let us recall that India took quickly to imports like potatoes, tea and most recently to soyabean. Professor Reddy has suggested that we may “break in” through the use of seaweeds as pizza seasoning, in spice sachets, so that people get used to them. After all, if the entire Eastern Asian population eats them, why not we from South Asia?

*The Hindu* February 16, 2019 17:28 IST

1. In your own words, write the central idea of the given passage. (2 marks)
2. Frame an appropriate title for the passage. (1 mark)
3. Why is mariculture as important as agriculture? (2 marks)
4. Give an alternate word from the passage that is similar in meaning to the list given below. (1 x 5 = 5 marks)
  - i) that which can be eaten
  - ii) food produced in a town or region
  - iii) as a pointed example
  - iv) a period of ten years
  - v) one who champions a cause
5. State whether the following are true or false. (1 x 5 = 5 marks)
  - i) Engineered photosynthesis is a part of genetic engineering.
  - ii) Improving agricultural yield is the dire need of the hour.
  - iii) Genetic engineering was a failure with tapioca and tobacco.
  - iv) Photorespiration in plants is highly beneficial.
  - v) Seaweed research began a decade ago.

### III. Summarise the following passage in your own words and give a suitable title.

(15 marks)

Add fibre to your diet to feel lighter during the day and increase your energy levels during exercise. Fibre can help you manage your weight. Foods rich in insoluble fibre can increase a sense of fullness without adding unwanted calories to your diet. In addition, as these foods require more chewing time, they can allow you to register when you're no longer hungry, so you're less likely to overeat. Do something to raise your metabolic rate every day. Try not to miss any opportunity to add movement to your day. Walk up the escalator, take the stairs, park a little bit further away from the front door. Results are measured in small steps.

High intensity training is the key. If you are undertaking an exercise programme, remember shorter, more intense workouts are the key to fitness breakthrough. There is no need to find the time for medium intensity 60 minute workouts. Weight training works! Include some resistance training in every workout. Lean muscle mass helps the body to burn more calories even when you are not working out. Get outdoors for a change. It's easy to find ways to build fun and intensity into your outdoor sessions. Benches, steps and low walls can all be used to add variety to your outdoor sessions. Your only limitation is your imagination!

Have a well-rounded workout programme. To address all the components of fitness, an exercise regime needs to include aerobics. Try continuous repetitive movement of large muscle groups that raises your heart rate such as weight lifting, strength training,

flexibility exercises or stretching. It takes about 12 weeks after starting an exercise programme to see measurable changes in your body. However, before 12 weeks, you will notice an increase in your strength and endurance.

Emerging research in the fields of neuroscience and nutrition show that people who eat a diet of modern processed foods have increased levels of depression, anxiety, mood swings, hyperactivity, and a wide variety of other mental and emotional problems. Exercise has been shown to produce hormones called endorphins that counteract these effects. So eat healthy and train hard! You burn more calories during the 23 hours you don't exercise, than the 1 hour you do. Pound for pound, muscle burns more calories at rest than body fat. So the more muscle you have, the higher your resting metabolic rate. Fight fatigue with exercise - even a brisk walk, can be more effective than a nap or cup of coffee at fighting fatigue.

Take the time and allow your muscles to recover from your workout. Muscles need time to repair and grow. Exercise increases energy levels and increases serotonin in the brain, which leads to improved mental clarity. Keep your weight workouts under an hour. After 60 minutes, your body starts producing more of the stress hormone cortisol, which can have a testosterone-blocking, muscle-wasting effect. Don't use sweat as an indicator of your workout intensity. Everybody reacts differently to different types of exercise. Sweating is an indicator that your body is trying to cool itself down - not an indicator of exertion. You may be burning a significant amount of calories without breaking a sweat.

Consume protein after a workout! Protein helps the repair of exercise-induced damage to muscle fibres, facilitates the replenishment of depleted energy and increases muscle protein synthesis after exercise to increase strength. Intense cardiovascular effort has a metabolic effect, meaning your body accelerates the energy you burn after these workouts. Try doing this kind of exercise in the morning, then eat smaller, protein-rich amounts of food to keep the metabolic fires burning. Especially when you're first getting started, a professional assessment can be extremely helpful in determining what type of exercise you need, improving your overall fitness balance and how to eat properly to ensure you get the best out of your workout.

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