November 13, 2017

Q.1) Consider the following statements about Aflatoxins

1. They are carcinogenic
2. They cause frameshift mutations
3. They are sometimes found in beer

Select the correct statements

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.1) Solution (d)

Aflatoxins are poisonous carcinogens that are produced by certain molds (Aspergillus flavus and Aspergillus parasiticus) which grow in soil, decaying vegetation, hay, and grains. They are regularly found in improperly stored staple commodities such as cassava, chili peppers, corn, cotton seed, millet, peanuts, rice, sesame seeds, sorghum, sunflower seeds, tree nuts, wheat, and a variety of spices.

Chronic exposure increases the risk of developing liver and gallbladder cancer, as aflatoxin metabolites may intercalate into DNA and alkylate the bases through epoxide moiety. This is thought to cause mutations in the p53 gene, an important gene in preventing cell cycle progression when there are DNA mutations, or signaling apoptosis (programmed cell death). These mutations seem to affect some base pair locations more than others, for example, the third base of codon 249 of the p53 gene appears to be more susceptible to aflatoxin-mediated mutations than nearby bases.

Aflatoxins B1, B2, G1, and G2 were determined at parts-per-trillion levels in beer.

Source: http://www.thehindu.com/sci-tech/agriculture/icrisat-researchers-make-peanuts-free-of-aflatoxin/article20048362.ece

Q.2) Consider the following statements

1. DNA methylation is a method for gene silencing through short RNAs.
2. The process of RNA inactivation by siRNAs is termed as RNA disfunction.

Select the correct statements

a) 1 Only

b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.2) Solution (a)

Gene silencing is the regulation of gene expression in a cell to prevent the expression of a certain gene. Gene silencing can occur during either transcription or translation and is often used in research. In particular, methods used to silence genes are being increasingly used to produce therapeutics to combat cancer and diseases, such as infectious diseases and neurodegenerative disorders.

Gene silencing is often considered the same as gene knockdown. When genes are silenced, their expression is reduced. In contrast, when genes are knocked out, they are completely erased from the organism's genome and, thus, have no expression. Gene silencing is considered a gene knockdown mechanism since the methods used to silence genes, such as RNAi, CRISPR, or siRNA, generally reduce the expression of a gene by at least 70% but do not completely eliminate it. Methods using gene silencing are often considered better than gene knockouts since they allow researchers to study essential genes that are required for the animal models to survive and cannot be removed. In addition, they provide a more complete view on the development of diseases since diseases are generally associated with genes that have a reduced expression.

Short RNAs can lead to gene silencing via DNA methylation.

siRNAs are short interfering RNAs. The process of RNA inactivation by use of these is called as RNA interference (RNAi).

Source: http://www.thehindu.com/sci-tech/agriculture/icrisat-researchers-make-peanuts-free-of-aflatoxin/article20048362.ece

Q.3) Union Cabinet has recently approved creation of National Testing Agency (NTA). Consider the following statements

1. It will be registered as a society under the Indian Societies Registration Act
2. It will conduct those entrance examinations which are currently being conducted by the CBSE

Select the correct statements

a) 1 Only

b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.3) Solution (c)

The Union Cabinet approved the creation of a National Testing Agency (NTA) to conduct entrance examinations for higher educational institutions.

Its creation will relieve the Central Board of Secondary Education (CBSE) – which conducts exams like the National Eligibilty-cum-Entrance Test – and the All India Council for Technical Education of the burden of conducting entrance tests.

The Union Cabinet chaired by Prime Minister Shri Narendra Modi has approved the creation of a National Testing Agency (NTA) as a Society registered under the Indian Society Registration Act, 1860, and as an autonomous and self-sustained premier testing organization to conduct entrance examinations for higher educational institutions.

The NTA will begin by conducting exams managed by the CBSE and gradually conduct other examinations too.

The NTA will be chaired by an eminent educationist appointed by the Ministry of Human Resource Development. There will be a Board of Governors comprising members from user institutions.

Source: http://www.thehindu.com/news/national/other-states/centre-approves-creation-of-national-testing-agency/article20109658.ece

Q.4) EcAMSat mission is associated with

a) Jupiter
b) Saturn
c) Mars
d) None of the above

Q.4) Solution (d)

E. coli AntiMicrobial Satellite (EcAMSat)

November 13, 2017

The E. coli AntiMicrobial Satellite (EcAMSat) mission will investigate space microgravity effects on the antibiotic resistance of E. coli, a bacterial pathogen responsible for urinary tract infection in humans and animals.

EcAMSat will investigate spaceflight effects on bacterial antibiotic resistance and its genetic basis. Bacterial antibiotic resistance may pose a danger to astronauts in microgravity, where the immune response is weakened. Scientists believe that the results of this experiment could help design effective countermeasures to protect astronauts' health during long-duration human space missions.

Source: http://www.thehindu.com/todays-paper/tp-miscellaneous/tp-others/scientists-to-send-e-coli-to-space/article20259627.ece

Q.5) Consider the following statements about Bonnet macaque

1. This species occurs in peninsular India
2. It is found only in evergreen and deciduous forest

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.5) Solution (a)

This species occurs in peninsular India (Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu). It is found from the southern tip of India up to the southern banks of Tapti River in the north, and to the Krishna River in the northeast.

Two subspecies of bonnet macaques have been identified: M. r. radiata and M. r. diluta

M. r. radiata

- It occurs in peninsular India (Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu). It is found in the major portion of the species' range south to the Palni Hills and southeast as far as Timbale, inland of Pondicherry.

M. r. diluta

- It occurs in southeastern coastal India (Kerala and Tamil Nadu). It is found from the south tip and southeastern coast of India, north to Kambam in the Western Ghats, at the southwestern foot of the Palni Hills in the centre and Pondicherry in the east.

This species is both arboreal and terrestrial. It is found in all forest types from scrub to evergreen and deciduous forest, plantations, agricultural lands, and urban areas, and is tolerant of disturbed habitats.

Source: **http://www.thehindu.com/sci-tech/energy-and-environment/bonnet-macaques-losing-their-ground-in-south-india/article20217588.ece**

IASbaba's Daily Quiz

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