

# **Science & Technology**

for

# **(UPSC PRELIMS- 2019)**

By

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# **UPSC PRELIMS**

# **2019**

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## **CHAPTER-1 (Introduction)**

**Q.1** Atal Innovation Mission is set up under the

- (a) Department of Science and Technology
- (b) Ministry of Employment
- (c) NITI Aayog**
- (d) Ministry of Skill Development and Entrepreneurship

## **CHAPTER- 3 (Energy)**

**Q.2** Consider the following Statements:

1. Petroleum and Natural Gas Regulatory Board (PNGRB) is the first regulatory body set up by the Government of India.
2. One of the tasks of PNGRB is to, ensure competitive markets for gas.
3. Appeals against the decisions of PNGRB go before the Appellate Tribunals for Electricity.

Which of the statements given above correct ?

- (a) 1 & 2 Only
- (b) 2 & 3 Only**
- (c) 1 & 3 Only
- (d) 1,2 & 3

## **CHAPTER- 3 (Energy)**

**Q.3** In the context of which one of the following are the terms 'pyrolysis and plasma gasification' mentioned?

- (a) Extraction of rare earth elements
- (b) Natural gas extraction technologies
- (c) Hydrogen fuel-based automobiles
- (d) Waste-to-energy technologies**

## **CHAPTER- 3 (Energy)**

**Q.4** In the context of proposals to the use of hydrogen-enriched CNG (H-CNG) as fuel for buses in public transport, consider the following statements:

1. The main advantage of the use of H-CNG is the elimination of carbon monoxide emissions.
  2. H-CNG as fuel reduces carbon dioxide and hydrocarbon emissions.
  3. Hydrogen up to one-fifth by volume can be blended with CNG as fuel for buses.
  4. H-CNG makes the fuel less expensive than CNG. Which of the statements given above is / are correct?
- (a) 1 only    **(b) 2 and 3 only**  
(c) 4 only    (d) 1, 2, 3 and 4

## **CHAPTER- 3 (Energy)**

**Q.5** Consider the following statements:

1. Coal sector was nationalized by the Government of India under Indira Gandhi.
2. Now, coal blocks are allocated on lottery basis.
3. Till recently, India imported coal to meet the shortages of domestic supply, but now India is self-sufficient in coal production.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 and 3 only  
(c) 3 only (d) 1, 2 and 3

## **CHAPTER- 3 (Energy)**

**Q.6** Which of the following statements are correct about the deposits of 'methane hydrate'?

1. Global warming might trigger the release of methane gas from these deposits.
2. Large deposits of 'methane hydrate' are found in Arctic Tundra and under the seafloor.
3. Methane in atmosphere oxidizes to carbon dioxide after a decade or two.

Select the correct answer using the code given below.

- (a) 1 and 2 only (b) 2 and 3 only  
(c) 1 and 3 only **(d) 1, 2 and 3**

## **(Chapter-7) (Space Tech)**

**Q.7** For the measurement/estimation of which of the following are satellite images/remote sensing data used?

1. Chlorophyll content in the vegetation of a specific location
2. Greenhouse gas emissions from rice paddies of a specific location
3. Land surface temperatures of a specific location

Select the correct answer using the code given below.

- (a) 1 only (b) 2 and 3 only  
(c) 3 only **(d) 1, 2 and 3**

## **(Chapter-10) (ICT)**

**Q.8** With reference to communication technologies, What is /are the difference/differences between LTE (Long-Term Evolution) and VoLTE (Voice over Long-Term Evolution) ?

1. LTE is commonly marketed as 3G and VoLTE is commonly marketed as advanced 3G.
2. LTE is data-only technology and VoLTE is voice-only technology.

Select the correct answer using the code given below.

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

## (Chapter-12) (ICT)

**Q. 9** In the context of digital technologies for entertainment, consider the following statements:

1. In Augmented Reality (AR) , a simulated environment is created and the physical world is completely shut out.
2. In Virtual Reality (VR), images generated from a computer are projected onto real-life objects or surroundings.
3. AR allows individuals to be present in the world and improves the experience using the camera of smart-phone or PC.
4. VR closes the world, and transposes an individual, providing complete immersion experience.

Which of the statements given above is / are correct?

- (a) 1 and 2 only   **(b) 3 and 4**  
(c) 1, 2 and 3   (d) 4 only

## (Chapter-12) (ICT)

**Q.10** Consider the following statements:

A digital signature is

1. An electronic record that identifies the certifying authority issuing it
2. Used to serve as a proof of identity of an individual to access information or server on Internet.
3. An electronic method of signing an electronic document and ensuring that the original content is unchanged.

Which of the statements given above is / are correct?

- (a) 1 only    **(b) 2 and 3 only**  
(c) 3 only    (d) 1, 2 and 3

## **(Chapter-12) (ICT)**

**Q.11** In the context of wearable technology, which of the following tasks is/are accomplished by wearable devices?

1. Location identification of a person
2. Sleep monitoring of a person
3. Assisting the hearing impaired person

Select the correct answer using the code given below.

- (a) 1 only (b) 2 and 3 only  
(c) 3 only **(d) 1, 2 and 3**

## **(Chapter-21) (IPR)**

**Q.12** Consider the following statements:

1. According to the Indian Patents Act, a biological process to create a seed can be patented in India.
2. In India, there is no Intellectual Property Appellate Board.
3. Plant varieties are not eligible to be patented in India.

Which of the statements given above is/are correct?

- (a) 1 and 3 only    (b) 2 and 3 only  
**(c) 3 only**            (d) 1, 2 and 3

## (Particle Physics)

**Q.13** Recently, scientists observed the merger of giant 'blackholes' billions of light-years away from the Earth. What is the significance of this observation?

- (a) 'Higgs boson particles' were detected.
- (b) 'Gravitational waves' were detected.
- (c) Possibility of inter-galactic space travel through 'wormhole' was confirmed.
- (d) It enabled the scientists to understand 'singularity'. d)

## **(Biotechnology)**

**Q.14** With reference to the recent developments in science, which one of the following statements is not correct?

- (a) Functional chromosomes can be created by joining segments of DNA taken from cells of different species.**
- (b) Pieces of artificial functional DNA can be created in laboratories.
- (c) A piece of DNA taken out from an animal cell can be made to replicate outside a living cell in a laboratory.
- (d) Cells taken out from plants and animals can be made to undergo cell division in laboratory petri dishes.

## (Biotechnology)

**Q.15** 'RNA interference (RNAi)' technology has gained popularity in the last few years. Why?

1. It is used in developing gene silencing therapies.
2. It can be used in developing therapies for-the treatment of cancer.
3. It can be used to develop hormone replacement therapies.
4. It can be used to produce crop plants that are resistant to viral pathogens.

Select the correct answer using the code given below.

- (a) 1, 2 and 4    (b) 2 and 3  
(c) 1 and 3        (d) 1 and 4 only**

## **(Biotechnology)**

**Q.16** What is Cas9 protein that is often mentioned in news?

- (a) A molecular scissors used in targeted gene editing
- (b) A biosensor used in the accurate detection of pathogens in patients
- (c) A gene that makes plants pest-resistant
- (d) A herbicidal substance synthesized in genetically modified crops

## (Health & Diseases)

**Q.17** Which one of the following statements is not correct?

- (a) Hepatitis B virus is transmitted much like HIV.
- (b) Hepatitis B, unlike Hepatitis C, does not have a vaccine.**
- (c) Globally, the number of people infected with Hepatitis B and C viruses are several times more than those infected with HIV.
- (d) Some of those infected with Hepatitis Band C viruses do not show the symptoms for many years

## (Health & Diseases)

**Q.18** Which of the following are the reasons for the occurrence of multi-drug resistance in microbial pathogens in India?

1. Genetic predisposition of some people
2. Taking incorrect doses of antibiotics to cure diseases
3. Using antibiotics in livestock farming
4. Multiple chronic diseases in some people

Select the correct answer using the code given below.

- (a) 1 and 2      (b) 2 and 3 only  
(c) 1, 3 and 4    **(d) 2, 3 and 4** scientists

## **(Miscellaneous)**

**Q.19** In India, the use of carbofuran, methyl parathion, phorate and triazophos is viewed with apprehension. These chemicals are used as

- (a) Pesticides in agriculture**
- (b) Preservatives in processed foods
- (c) Fruit-ripening agents
- (d) Moisturising agents in cosmetics to understand

## (Biology or Ecology)

**Q.20** Consider the following statements:

1. Some species of turtles are herbivores.
2. Some species of fish are herbivores.
3. Some species of marine mammals are herbivores.
4. Some species of snakes are viviparous.

Which of the statements given above are correct?

- (a) 1 and 3 only
- (b) 2, 3 and 4 only
- (c) 2 and 4 only
- (d) 1, 2, 3 and 4'.**

# THANK YOU

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### About the Author

Dr. Ravi P Agrahari, a Ph.D. from IIT Delhi, is a recipient of Junior Research Fellowship and Senior Research Fellowship from CSIR, Government of India. He worked as a research scientist in IIT Delhi from 2015 to 2017. Mr. Agrahari is presently working as an independent consultant in the field of Environment, renewable and sustainable energy and biomass issues at the Bag Energy Research Society, Varanasi and Rene Foundation Thoothukudi (Tamil Nadu). He is an expert in the field of energy and has published various papers in many reputed international journals. He has attended many international conference in Sweden and France. Dr. Agrahari is well known for his expertise in "Environment Science" and "Science and Technology" and has authored several books on these topics for UPSC examinations. He has been teaching for over 15 years. Dr. Agrahari has been associated with more than 50 reputed coaching institutes in more than 15 states of India. He is also associated with various NGOs and Civil Societies for the welfare of weaker section and minority students.

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