

# Science & Technology

## SESSION - 1 (IT, Electronics & Institutions)

### 1. IT and Computer

- ▶ Mobile Generations And Technology
    - The Evolution of Wireless Generations - 1G, 2G, 3G, 4G
  - ▶ Telecommunication Technology
    - The two telecom technologies are:
      - GSM
      - CDMA
    - Different Telecom Technologies
  - ▶ Supercomputer And Its Applications
    - Supercomputers
    - Tianhe-2 or TH-2 ("Milky Way 2")
    - Param Yuva II
    - Pratyush Supercomputer
- National Supercomputing Mission
  - ▶ Initiatives in IT Sector
    - Digital India Program
    - Meghraj Initiative Computing
    - Code Free for India
    - e-Kranti : NeGP 2.0
    - Use of IT in financial inclusion
    - Big Data Initiative
    - Google Project loon
    - UPI / BHIM / USSD / AADHAR PAY
    - Bharat Net Project
    - White Space
    - Web Portals Government

### Current Affairs List

1. Quantum computing
2. Project brainwave has been launched by Microsoft
3. Ministry of science and technology and earth sciences had launched 'Sagar Vani System'
4. CERT-In issued alert on Locky Ransomware
5. Commission for Scientific and Technical terminology (CST TT) has coined the Hindi word for computer i.e., "SANGANAK"
6. India's first technology and innovation support centre (TISC) to come up soon
7. Forum to formulate a strategy to adopt SG – in the country by 2020
8. Software to classify people for Ayurveda treatment
9. TRAI recommendations delicensing of some spectrum for M2M services
10. Increase in usage and application of Big-Data for effective policy making
11. World's first artificial intelligence politician named SAM
12. India ranked 109th out of 122 countries in the mobile internet speed released by Ookla
13. Net neutrality
14. Petya and Locky, BAD Rabbit ransomware
15. National cyber coordination centre
16. HORTINET
17. Robobee
18. Project Brainwave
19. Digital Transaction Methodologies
20. Blockchain

## 2. S&T Policy and Institutions

- ▶ Policies Related to Science & Technology
  - Science, Technology & Innovation Policy 2013

- National Intellectual Property Rights Policy
- National Biotechnology Development Strategy 2015-2020
- Technology Vision Document 2035
- Space Vision India 2025

### Current Affairs List

1. Nobel prize for chemistry
2. Nobel prize for Medicine
3. Nobel prize for Physics
4. Tim Berners-Lee, Inventor of the World Wide Web, Wins A.M. Turing Award
5. Professor Vikram Vishal From IIT Bombay Wins INSA Young Scientist Award 2017
6. Indian-American Gitanjali Rao (11) won the 2017 Discovery Education 3M Young Scientist Challenge
7. Indian National Science Academy awards

## SESSION - 2 (Biotechnology & Health)

### 1. Biotechnology

- ▶ Biotechnology Terminologies
  - Different types of biotechnology
  - Terminologies associated with the biotechnology
- ▶ Applications of Biotechnology
  - Applications of Biotechnology in Medicine
  - Applications of Biotechnology in Agriculture
  - Application of Biotechnology in Food Processing

- Application of Biotechnology in Environment
- ▶ Biotechnology Projects
  - 1,000 Genomes Project
  - International HapMap Project
  - Human Genome Project
  - Biotechnology Park of Women
  - U.K. grants gene editing licence
  - GM Mustard Issue
  - Genetically Modified Mosquito
  - Designer babies' or Three parents babies

### Current Affairs List

#### Genetics

1. ICMR bans Banking of many stem cell sources
2. CSIR-IGIB and NCDC Researchers develop DNA sensor for quick pathogen detection
3. Chinese repair genetic defect causing Thalassemia
4. Film clip in a fragmented DNA
5. REPAIR: A new gene editing tool to combat genetic diseases
6. Scientists for the first time edited genes of human embryos CRISPR-CASA

#### Biotechnology

1. New programs to bring paradigm shift in the field of biotechnology in the north eastern region (NER)
2. Genome sequencing of Ragi done for the first time in the world
3. GM mustard policy
4. DNA as storage device
5. Biomarker
6. Algae based footwear
7. Artificial Womb raises hope for premature babies
8. U.K. grants gene editing licence
9. GM Mosquito
10. DBT launched "Sohum" an innovative newborn hearing screening device
11. Biotech-KISAN scheme
12. India's first biomass to ethanol plant & its commercialization

### 2. Health

- ▶ Diseases
  - Causes of Diseases/Disease Agents

- Types of Disease
- Diseases in News
- ▶ Vaccine and its Types
  - Types of vaccines

- Mission Indradhanush
- ▶ Recent Initiatives
  - IT in Health
  - Health geo-mapping project
  - Project sunrise for AIDS

- 2nd national Deworming initiative launched
- Rotavac vaccine
- Smart drugs
- Swachh Swasth Sarvatra initiative
- Swasthya Raksha Programme

### *Current Affairs List*

1. India has declared free from Bird flu and notified it to the World Organisation for animal health.
2. Revised Draft guidelines for stem cell research, 2017
3. Indian American developed a therapy for sepsis
4. Curmin, A bioactive component of turmeric treats cancer in children study
5. Nosocomial infections and critical India's health care infrastructure
6. New ancient remedy to fight against kala Azar, Parasite Leishmania, leptomonas seymouri
7. Embryo transfer technology to increase livestock productivity
8. New committee to frame rules for starting procedures
9. Union Ministry of Science and Technology has launched "SOHUM" an indigenously developed newborn hearing screening device
10. A new vermilion (Bindi) embedded with iodine along with the adhesive base
11. First gene therapy for treating acute lymphoblastic leukaemia
12. Kyasanur forest disease on monkey fever
13. "Implantable bio-artificial pancreas" developed by IIT Guwahati
14. A Device to test infants field of vision
15. Gen expert machine for testing multiple diseases
16. 3D printing in medical sector
17. Novel compounds destroy biofilm forming bacteria
18. Vaccine that can protect against gonorrhoea
19. Switzerland have developed a 3D-printed soft silicone heart
20. Low cost test to detect Zika Virus in blood
21. World's first plan based Zika Vaccine from tobacco plant
22. Spanish scientist discover neovibocin compound as Anti-Zika drug
23. H1N1 medicine raises fears of drug resistance
24. Rotavirus vaccine tested on children during the trial is safe and efficacious
25. Human antibodies produced in lab for first time
26. Scientists develop artificial womb to save premature babies
27. Scientists develop bio-glue for wound healing
28. Breakthrough in the field of antibiotic resistance
29. IIT researchers develop biosensors to detect kidney disorders
30. Smart bandage to promote better, faster healing
31. CCMB in association with IIRR developed low Glycemic index rice which is suitable for people with diabetes
32. Government has launched Noxeno, A nasal foreign body removal
33. WHO to classify gaming disorder as mental health condition
34. Intensified diarrhea control fortnight
35. WHO revises antibiotics protocol (drug resistant TB in children more)
36. Ban oxytocin
37. National strategic plan for malaria elimination
38. India free from bird flu
39. IISER pune developed Novel drug to kill cancer
40. Measles-Rubella vaccination second phase
41. Monkey fever
42. Hospital acquired infection
43. Intensified mission Indradhanush
44. Bovine TB

## SESSION - 3 (Space & Defence)

### 1. Space

- ▶ Space Organizations in India
  - Vikram Sarabhai Space Centre (VSSC)
  - ISRO Satellite Centre (ISAC)
  - Satish Dhawan Space Centre (SDSC)/ Sriharikota High Altitude Range (SHAR)
  - Liquid Propulsion System Centre (LPSC)
  - Space Applications Centre (SAC)
  - Antrix Corporation Limited
- ▶ Terminologies Related to the Space Science
  - Terms related to the path of the satellite
  - Types of orbits
  - Launch vehicles
- ▶ Types of Satellites
  - Astronomical Satellites
  - Communications Satellites
  - Earth Observation Satellites
  - Navigation Satellites
- Reconnaissance Satellites:
- Weather Satellites
- Student Satellites
- ▶ India Satellite Programmes
  - Insat
  - Remote sensing
  - Applications of Remote Sensing Satellite
- ▶ Space: Recent and Future Missions
  - Recent space missions ISRO
  - Space exploration
  - Navigation satellite missions
  - Future mission
  - International collaboration projects
  - India's Gravitational Wave Observatory (IndiGO)
    - *Thirty Meter Telescope Project*
    - *India, NASA join hands for astrobiology mission*

### Current Affairs List

1. Indian scientists have discovered a super cluster of galaxies known as "Saraswati".
2. Nasa along with international space agencies developing asteroid impact and deflection assessment mission.
3. ISRO has approved commercial use of Lithium-Ion battery technology
4. ISRO plans to launch Hyperspectral imaging satellite
5. Water propulsion system in CUBESAT
6. First spacecraft to orbit Saturn-cassini Mission is ending its Journey
7. OSIRIS-Rex passed by earth to reach asteroid Bennu
8. MEITY launched nation wide Hackathon # Open Gov Data Hack
9. Google Lunar X Prize Competition
10. NASA-ISRO synthetic aperture radar satellite (NISAR) at stake
11. GSAT-17, heaviest communication satellite of ISRO launched from French Guiana
12. Major solar flare detected in dwarf star close to sun
13. 'India's Satellite Man' is no more
14. Ground delays outside India are holding up the benefits of GSAT-9.
15. UK have discovered the smallest star in the universe
16. Astrosat, Chandra and Hubble Jointly detect massive cosmic explosion on proxime centauri
17. NASA successfully launches tracking and data relay satellite – M
18. TRAPPIST-1 plants likely to have water
19. Israel launches first environmental research satellite venus
20. Scientists create first global map of water on moon
21. Japan aerospace exploration agency (JAXA) launches fourth Michibiki Satellite for Hit-Tech GPS
22. World's largest aircraft "Strato launch" successfully passes first engine test
23. ISRO's MOM complete 3 years in orbit
24. China launches two BeiDou-3 Navigation satellites
25. NASA launches joint polar satellite system-1
26. NASA successfully tested supersonic landing parachute for mars 2020 mission
27. ISRO is set to launch first solar mission aditya L-1 in 2019
28. ISRO is developing small satellite launch vehicles to launch low cost small satellites
29. Space X for the first time successfully launched recycled rocket and spaceship
30. China's AG 600 also known as 'Kunlong' the world's largest amphibious aircraft takes off
31. China has successfully launched its second land surveying satellite LKW2
32. China successfully launches remote sensing satellite of yaogan-30 project

33. ISRO's PSLV-40 to launch 31 satellites in single mission in January 2018
34. GSLV MK 111-DI/GSAT 19
35. Gravitational waves news
36. Radio galaxies
37. Indigenously developed S-Band Doppler weather radar
38. Saraswati: Supercluster of galaxies
39. Kelvin waves
40. NISAR MISSION
41. Study of Eclipse
42. Versius
43. CASSINI
44. ISRO made satellite based chip system
45. TDRS-M NASA

## 2. Defence

- ▶ Missile System
  - Missile vs Rocket
  - How does Missile Work?
  - Propulsion Systems
  - Launch Platforms
  - Speed
  - Stealth Technology
- ▶ Classification of Missiles
  - On the basis of Type
  - On the basis of Launch Mode
  - On the basis of Range
  - On the basis of Propulsion
- ▶ Integrated Guided Missile Development Programme

- India's Missile System
- ▶ UAVs (Unmanned Aerial Vehicles)
  - UAV of India
  - Applications of UAVs other than military applications
- ▶ Submarines
  - How do submarines operate?
  - What is stealth technology?
  - Indian Submarines
    - INS Arihant
    - INS Vikrant
- ▶ Latest & International Collaboration
  - Latest joint defense exercises
  - Latest agreements
  - Latest operations
  - Latest launches
  - Latest DRDO achievements

## Current Affairs List

1. 'NIRBHAY' sub sonic cruise missile
2. Brahmos (air launched)
3. INS Koltar
4. INS Kiltan
5. First indigenously built floating dock launched
6. NAG missile
7. Hydrogen bomb
8. Vikram OPV
9. Integrated Quarter Master Package
10. INS kalvari
11. Prithvi II
12. Air independent Propulsion
13. Rukmini

## SESSION - 4 (Renewable Energy & Nuclear Energy)

### 1. Renewable Energy

- ▶ Solar energy
- ▶ Wind energy
- ▶ Geothermal power
- ▶ Tidal energy
- ▶ Wave energy
- ▶ Biomass energy
- ▶ Hydrogen as a Fuel for Future or Hydrogen as an Alternative Energy Source

- ▶ Microbial Fuel Cell
- ▶ Hydro-electricity

### 2. Nuclear Technology

- ▶ Nuclear technology
  - Types of nuclear reactions
  - Nuclear power reactors
  - Advantages and disadvantages of nuclear fission energy

- ▶ Nuclear Programme in India
  - Key milestones of Nuclear Programme
  - N-Power Policy of India
  - Indian Research Reactors
  - Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI)
- ▶ Institutions
- ▶ Radiation Technologies and Applications
  - KRUSHAK (Krushi Utpadan Sanrakshan Kendra) Lasalgaon, district Nashik, Maharashtra

- Preservation of Food and Hygienization
- Health Care
- Sterilization of Medical Products
- Industrial Applications of Radioisotopes
- Industrial Accelerators
- Industrial Applications of Lasers
- Laser Technology Development

### *Current Affairs List*

1. SIBIR world's biggest and most powerful Ice breaker ship launched by Russia
2. KKNPP
3. DAE is establishing a small underground research laboratory in one of the uranium mines for pursuing research on dark matter.
4. Nuclear Fuel Complex (NFC) has also given highest ever production of fuel elements, zirconium sponge, and other materials.
5. Board of Radiation and Isotope Technology (BRIT) has achieved its highest ever sales turnover and has been able to supply the radio-isotopes to every corner of the country.

## SESSION - 5 (Nanotechnology & Robotics)

### 1. Nanotechnology

- ▶ Nanotechnology and its Applications
  - Application of Nanotechnology
    - Nano Medicine
    - Food
    - Semiconductors and Computing
    - Textiles
    - Sustainable Energy

- Environment
- Transport
- Space
- Agriculture
- ▶ Nanotechnology Initiatives
  - Nano Mission of India
  - Other initiatives
  - India's international collaborations

### *Current Affairs List*

1. Low cost nanometer scale, sensitive co sensor has been developed by IISC
2. Application of Nanomaterials in bioremediation
3. IIT Delhi researchers develops new technology based drug delivery system
4. Keratitis

### 2. Robotics

- ▶ Robotics Terminologies
  - Parts of a Robot
  - Classification of Robots
  - Types of Robots

- Robotics and Artificial Intelligence
- ▶ Robotics Applications
  - Military Robots (Robotic soldier)
  - Medical Robots (Robotic Medicine)
  - Development of Robotics in India
  - Future of Robotics in India

### *Current Affairs List*

1. Scientists have developed the world's smallest surgical robot called 'versius'
2. Scientists create world's first molecular robot
3. Cobots to work hand in hand with humans

## Miscellaneous News

1. CIPAM (Cell for IPR Promotion and Management) has launched a 'Scheme for IPR awareness-creative India – Innovate India'
2. World's most powerful X-ray LASER unveiled in Germany (XFEL)
3. Project varshadhari – Karnataka's Ambitious cloud seeding project
4. Pt. Deen Dayal Upadhyay Vignan Gram Sankul Pariyojana
5. Six new modes of public transportation

- system have been cleared by NM aayog
6. GPS is mandatory in all mobile phones in India from January 1, 2018
  7. New technology for indentifying the adulterants in milk and for processing raw hides and skins is developed by CSIR
  8. CSIR has initiated a new programme known as 'MGYASA' as a part of scientific social responsibility (SSR)
  9. NHAI launched 2 mobile apps My Fast ag and FAST ag to facilitate electronic toll collection
  10. SUNRISE project (about solar energy products)
  11. AP plans to connect Amaravati, Vijayawada via hyperloop
  12. Malpelo plate – 57th tectonic plate to be discovered
  13. IISER Kolkata develops fire retardant, rust resistant material
  14. Bionic leaf – CSIR scientists develop artificial leaf create hydrogen fuel from sunlight
  15. indigenously developed s-band Doppler weather Radar commissioned in Kochi
  16. Tata Motors unveils India's first Bio-CNG Bus
  17. NITI-Aayog has setup a committee to develop a road Map for the implementation of the intelligent transportation systems (ITS) policy- panel on national ITS policy
  18. IISER scientists develop gelator to remove oil from spills
  19. Castor plant can reduce soil pollution – study
  20. Scientists develop super-flexible and strong artificial silk
  21. World's first wind farm built off Scotland coast
  22. China successfully produces gas from flammable ice under South China Sea
  23. India's first calf born to surrogate cow in Pune
  24. CARBFIX project begins operations in Iceland
  25. CSIR – NIIST Scientist develop organic Near Infrared Filter
  26. China launches world's first hybrid electric tram powered by hydrogen fuel cells
  27. NCCRD (National Centre for Combustion Research and Development) was inaugurated at IIT Madras
  28. Kilogram will get new measure set by value of planck constant from 2019.
  29. Scientists develop earthquake proof concrete
  30. China launched world's first fully electric cargo ship
  31. World science day for peace and development is celebrated on 10th November with theme "Science for Global Understanding"
  32. India's first pod tax project or personal rapid transit (PRT) to follow us safely norms
  33. China successfully tested its first photovoltaic road
  34. New state of matter
  35. CSIR Aroma Mission
  36. CSIR at the Ninth Position Worldwide - SCImago Institutions Ranking World Report 2017
  37. CSIR Phytopharmaceuticals Mission
  38. CSIR has launched a program named JIGYASA
  39. CSIR Developed Integrated Drishti-Aviation Weather Monitoring System
  40. Open sea cage culture

*Current Affairs Topics will be Updated Till April, 2018*