Q.1) What is metrino?

a) A breed of sheep known for its wool
b) A personal rapid transit system being developed in National Capital Region
c) A high energy neutrino discovered by CERN
d) A new subatomic particle found at IceCube Neutrino Observatory

Q.1) Solution (b)

The ambitious personal rapid transit system – Metrino PRT – will be implemented in National Capital Region to decongest the roads. Metrino project lets passengers use India's first driverless pods - suspended on a ropeway. The project is being developed by National Highways Authority of India under Ministry of Transport.

Under the project, fully automatic, driverless small pods travel independently suspended over an overhead network which is usually 5-10 meters above the ground. The ropeway system runs on electricity, and driverless pods come down at designated stations, thus shifting the traffic burden from the already congested roads.
Source: http://www.ndtv.com/india-news/decks-cleared-for-rs-800-crore-pilot-metrino-project-nitin-gadkari-1469118

Q.2) Consider the following statements about TRI-NETRA

1. It is an assisted vision system for locomotive drivers
2. It uses a combination of optical cameras, infrared cameras and radars based terrain mapping system
3. The concept was developed by Council for Scientific and Industrial Research (CSIR)

Choose the correct statement[s]

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

Q.2) Solution (b)

The Indian Railways has initiated a process to launch the Terrain Imaging for Diesel Drivers-Infrared Enhanced Optical and Radar Assisted (Tri-NETRA) system, with the intention of avoiding train accidents caused due to visibility constraints. The concept of TRI-NETRA was developed by Development Cell under the guidance of Member Mechanical, Railway Board

The system would comprise of high-resolution optical video camera, high sensitivity infra-red video camera and additionally, a radar-based terrain mapping system. It would combine the images captured by the three sub-systems and create a composite video image that will be displayed in front of the Loco Pilot on a computer monitor, enabling the pilot to see the terrain before the running locomotive reaches the point. The system once installed, will help in enhancing the vision of the locomotive drivers in difficult weather conditions, such as fog, heavy rains, during night time etc, so that they have enough time to apply brakes without hitting the objects/obstructions.

Source : http://pib.nic.in/newsite/PrintRelease.aspx?relid=147159

Q.3) What are replicons?

a) A genome segment that can replicate on its own independent of cellular chromosome
b) A genus of bacteria capable of replicating itself
c) The cells of umbilical cord which can develop which can develop into any organ
d) The enzyme which assists the process of RNA replication

Q.3) Solution (a)

In News : Scientists develop Zika Replicon system to find ways to combat virus

Replicons are segments of genome that can replicate on its own independent of cellular chromosome. These replicons can be used to locate portions of the viral molecule that block or halt viral replication, making it a powerful tool for vaccine development.

The new Zika replicon system has deleted some of the genes that give the virus its structure. Because of this, the altered Zika virus is no longer infectious, lowering the safety risk involved in working with it.

Source : http://www.news-medical.net/news/20161118/Researchers-create-new-Zika-replicon-system-to-find-ways-to-combat-virus.aspx

Q.4) Facebook launched a solar powered drone for internet access. What is it called?

a) Free Basics
b) Internet Sathi
c) Aquila
d) Project Loon

Q.4) Solution (c)

The solar-powered plane Facebook designed to beam internet to remote parts of the world is called **Aquila**

Free Basics is a partnership between Facebook and six companies (Samsung, Ericsson, MediaTek, Opera Software, Nokia and Qualcomm) that plans to bring affordable access to selected Internet services to less developed countries by increasing efficiency, and facilitating the development of new business models around the provision of Internet access

Google's **Internet Saathi** programme, launched in association with Tata Trusts, has been helping close the digital literacy gap across genders since it came into operation in July 2015. The program has been training "Saathis" or partners among women to use tablets and smartphones to explore the benefits of internet in their day to day life, who in turn train scores of other women in their villages and nearby areas.

Project Loon is a research and development project being developed by X (formerly Google X) with the mission of providing Internet access to rural and remote areas. The project uses high-altitude balloons placed in the stratosphere at an altitude of about 18 km (11 mi) to create an aerial wireless network with up to 4G-LTE speeds

Q.5) What is TeamIndus Moon Mission?

a) A group of scientists exploring the effect of moon's gravity on powerful tidal waves on river Indus
b) A team of scientists at ISRO studying the feasibility of manned mission to moon
c) A mission by a private company to send a robot to moon to explore at least 500m and transmit HD video image back to earth.
d) A team of negotiators headed by former UN General Secretary Ban Ki Moon to facilitate talks between India and Pakistan over Indus Water Treaty

Q.5) Solution (c)

TeamIndus is the only Indian team competing for the Google Lunar XPRIZE. The $30M Google Lunar XPRIZE is a global competition to challenge and inspire engineers and entrepreneurs to develop low-cost methods of robotic space exploration. To win, a privately funded team must successfully place a robot on the Moon that explores at least 500 meters and transmits high-definition video and images back to Earth.

Team Indus has procured a launch services agreement with Antrix Corporation Ltd., the commercial arm of ISRO to source India's highly reliable Polar Satellite Launch Vehicle or PSLV for launching a lunar orbiter and lander sometime in the fourth quarter of 2017.

Q.6) Hafnium Carbide and Tantalum Carbide are refractory ceramics known for their

a) Semi conducting properties
b) High heat resistance
c) High electrical conductivity
d) High malleability

Q.6) Solution (b)

UK-based researchers have identified Hafnium carbide (HfC) as the world's most heat resistant material. It can withstand record melting point temperatures up to 3958°C (approx 4000°C).

This discovery may pave the way for improved heat resistant shielding for the faster-than-ever hypersonic space vehicles. These materials will enable spacecraft to withstand the extreme heat generated from leaving and re-entering the atmosphere.

Source : http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_22--12-2016-10-21-10

Q.7) Carnegie Mellon University has developed a material called Thubber. What is it?

a) Rubber with high thermal resistance
b) Rubber with metal like thermal conductivity
c) A compound of thallium with ability to stretch to ten times its length
d) Rubber specifically developed for insulation in thermal power plants

Q.7) Solution (a)

Carnegie Mellon University has developed a thermally conductive rubber nicknamed "thubber". (Rubber is usually an insulator) It exhibits a combination of metal-like thermal conductivity and elasticity similar to soft, biological tissue that can stretch over six times its initial length.

Applications could extend to industries like athletic wear and sports medicine - think of lighted clothing for runners and heated garments for injury therapy. Advanced

manufacturing, energy, and transportation are other areas where stretchable electronic material could have an impact.

Source : http://indiatoday.intoday.in/story/thubber-may-lead-to-soft-stretchable-electronics/1/882418.html

Q.8) Low temperature thermal desalinization plants are operational in India in places like Lakshadweep and Chennai. What is the principle involved in these plants?

a) Reverse osmosis at room temperature
b) Water evaporates even at low temperature at low pressure
c) Water evaporates even at low temperature when subjected to very high pressure
d) Reverse osmosis at low temperature which is accelerated by application of pressure

Q.8) Solution (b)

The Reverse Osmosis, a membrane process, is globally accepted technology suitable for desalination of saline water, which is quite different from Low Temperature Thermal Desalinization technology developed by the ministry of earth sciences. The LTTD is a process under which the warm surface sea water is flash evaporated at low pressure and the vapour is condensed with cold deep sea water. The LTTD technology does not require any chemical pre and post-treatment of seawater and thus the pollution problems are minimal and suitable for island territories. Since no effluent treatment is required, it gives less operational maintenance problems compared to other desalination processes. The LTTD technology is completely indigenous, robust and environment friendly.

Q.9) Norway recently announced turning off analogue FM signals and shifting to Digital Audio Broadcasting. Which of the following statements are true regarding Digital Audio broadcasting?

1. Digital signals give better audio quality and coverage in comparison to analogue FM signals
2. Digital Audio Broadcasting suffers slightly higher losses due to interference from buildings and other obstructions when compared to FM signals

Choose the correct statement[s]

a) 1 only
b) 2 only
c) Both 1 and 2

d) Neither 1 nor 2

Q.9) Solution (a)

Norway is the first country in the world to start switching off its analogue radio signals, in favour of Digital Audio Broadcasting, or DAB.

The digital signal gives better quality and coverage than analogue - and for about an eighth of the cost.

AM/FM commonly suffers with loss of quality from interference caused by signals bouncing off buildings, towers and natural structures like mountains. Since Norway has many mountains, valleys and fjords, it makes a lot of sense for the country to go for digital radio, which gives out a steady signal in any topography.

Source : http://indianexpress.com/article/explained/why-norway-is-discarding-fm-for-digital-radio-dab-4469936/

Q.10) Indian scientists have developed a Ceramic Polyment Hybrid CASPOL. Consider the following statements about CASPOL

1. It is developed by CSIR in collaboration with IIT-Kharagpur
2. It is a water based, ready-to-coat and easy-to-use flame proof coating having both societal and advanced end-use applications.
3. The material coated with CASPOL will be self-extinguished within 4 seconds after removal of flame

Which of the above statements are incorrect

a) 1 only
b) 2 only
c) 3 only
d) None of the above

Q.10) Solution (a)

Indian Space Research Organisation at its Vikram Sarabhai Space Centre (VSSC) has developed CASPOL (CeramicPolymer Hybrid), a water based, ready-to-coat and easy-to-use flame proof coating having both societal and advanced enduse applications. It confers excellent flame retardant, waterproofing and thermal control properties to substrates ranging from masonry surfaces, textiles, paper, thatched leaves, wood etc to advanced materials like polyurethane and phenolic based thermal insulation foam pads.

Salient features

1. Contains no toxic materials
2. No liquid or vaporizable material (except water)
3. Human and eco-friendly
4. Brushable and sprayable
5. Low cost

CASPOL is a room temperature curable, water based formulation having self-extinguishing properties, good adhesion and water repellence characteristics. It is based on ceramic composition dispersed in an aqueous polymeric emulsion containing flame retardant components. All the ingredients are dispersed in water to get a suspension of the required viscosity for application by brushing or spraying. It is having limiting oxygen index (LOI) above 40. The material VSSC coated with CASPOL will be self-extinguished within 4 seconds after removal of flame. It is also having good adhesion to the substrate surface both in dry condition and after exposing the coated foams in water shower. Foam materials can be impregnated with CASPOL by dip coating.

Source : http://www.isro.gov.in/sites/default/files/pdf/technologytransfer/CASPOL.pdf

Q.11) What is Lakshmi Robot?

a) A robot to collect fees and other levies in all government offices developed by IISc
b) A banking robot capable of answering queries related to account balance, loans, fixed deposits, payments etc. developed by City Union Bank
c) A robot to perform repetitive, high volume and time consuming tasks developed by ICICI Bank
d) A robot to monitor attacks on banking system developed by NPCIL

Q.11) Solution (b)

Lakshmi Robot is India's first banking robot. It has been launched by City Union Bank, Kumbakonam. It will be capable of answering queries related to account balance, loans, fixed deposits, payments etc. It is currently adept in English. Also, unlike other banking robots, its speech is more relaxed and casual rather than being formal. It is based on artificial intelligence and also has the capability to learn from the consumers.

Source : http://www.thehindu.com/news/cities/chennai/Say-hello-to-Lakshmi-the-banking-robot/article16443676.ece

Q.12) NASA recently announced a mission Parker Solar Probe scheduled for summer 2018. What is it?

a) A mini satellite to monitor temperatures effect across the poles
b) A mission to solar atmosphere
c) A mission to probe sun like stars in close vicinity to solar system
d) A mission to monitor solar radiation across tropical countries to identify areas suitable for large solar power plants

Q.12) Solution (b)

NASA announced the red-hot mission Solar Probe Plus at the University of Chicago. The name of the probe has been renamed as the Parker Solar Probe in honor of astrophysicist Eugene Parker.

Scheduled to launch in summer 2018, the Parker Solar Probe will fly within 6.4 million km of the sun's surface right into the solar atmosphere. It will be subjected to brutal heat and radiation like no other man-made structure before. The purpose is to study the sun's outer atmosphere and better understand how stars like ours work.

Q.13) Consider the following statements about Cyclone Global Navigation Satellite System CYGNSS developed by NASA

1. It is a constellation of 7 mini satellites
2. The 3 satellites are placed in geostationary orbit and four satellites in geosynchronous orbit
3. CYGNSS will make frequent measurements of ocean surface winds in the tropics, with a primary objective of monitoring the location, intensity, size, and development of tropical cyclones

Choose the correct statement[s]

a) 1 only
b) 1 and 2 only
c) 1 and 3 only
d) 3 only

Q.13) Solution (d)

NASA's Cyclone Global Navigation Satellite System (CYGNSS) -- a constellation of eight microsatellites that will take detailed measurement of windspeeds inside hurricanes -- successfully completed the development and on-orbit commissioning phases of its mission

on March 23 and moved into the science operations phase. The spacecraft have now begun their science instrument calibration and validation and are on track to deliver the first science data in May, just in time for the start of the 2017 Atlantic hurricane season.

The CYGNSS spacecraft, launched into low-inclination, low-Earth orbit over the tropics on December 15, will make frequent measurements of ocean surface winds in and near a hurricane's inner core, an area that up until now has proven impossible to probe accurately from space. CYGNSS is able to measure the surface winds using GPS signals reflected by the ocean surface, which are able to penetrate through the intense rain in a storm's eye wall.

Q.14) Extremely Large Telescope, the world's largest optical telescope is being developed by European Science Observatory in which of the following countries?

a) Netherlands
b) France
c) Chile
d) Namibia

Q.14) Solution (c)

Construction began in Chile on the European Extremely Large Telescope, which when completed will be the world's largest optical telescope, some five times larger than the top observing instruments in use today.

Located on a 3,000 meter-high mountain in the middle of the Atacama desert, it is due to begin operating in 2024.

Among other capabilities, it will add to and refine astronomers' burgeoning discoveries of planets orbiting other stars, with the ability to find more smaller planets, image larger ones, and possibly characterize their atmospheres, a key step in understanding if life is present.

Source : http://www.reuters.com/article/us-chile-telescope-idUSKBN18M2JX

Q.15) Scientists at IIT-Rourkee have developed low cost and more efficient solar cells using natural pigments present in

a) Mulberry fruit
b) Jamun fruit
c) Coffee beans
d) Black pepper

Q.15) Solution (b)

Scientists at IIT Roorkee have used the juicy, delectable Indian summer fruit Jamun to create inexpensive and more efficient solar cells.

Researchers used naturally occurring pigment found in jamun as an inexpensive photo-sensitizer for Dye Sensitized Solar Cells (DSSCs) or Gratzel cells. Gratzel cells are thin film solar cells composed of a porous layer of titanium dioxide (TiO2) coated photo-anode, a layer of dye molecules that absorbs sunlight, an electrolyte for regenerating the dye, and a cathode.

These components form a sandwich-like structure with the dye molecule or photosensitizer playing a pivotal role through its ability to absorb visible light.

Source : **http://www.thehindu.com/sci-tech/science/iit-scientists-create-low-cost-solar-cells-using-jamun/article18333363.ece**

Q.16) CORPAT is a bilateral naval exercise between

a) India and Maldives
b) India and Vietnam
c) India and Indonesia
d) India and Sri Lanka

Q.16) Solution (c)

The 27thseries of India – Indonesia Coordinated Patrol (CORPAT) is being conducted from 28 Apr to 19May 16. The Indonesian Navy and the Indian Navy have been participating in coordinated patrol (CORPAT) twice a year since 2002. The objective of the exercise is to keep this vital part of the Indian Ocean Region safe and secure for commercial shipping and international trade.

Source : https://www.indiannavy.nic.in/content/27th-india-indonesia-coordinated-patrol-corpat

Q.17) Choose the *incorrect* statement with respect to GM Mustard

a) It is the first edible food crop approved for commercial use by Genetic Engineering Appraisal Committee
b) It has been indigenously developed by Delhi University based Centre for Genetic Manipulation of Crop Plants

c) NITI Aayog in its three year draft plan had backed GM crops
d) Sarson Satyagraha, a platform for organising farmers,consumers, scientists and others has raised concerns on commercialisation of GM Mustard.

Q.17) Solution (a)

Genetic Engineering Appraisal Committee (GEAC) gave a positive recommendation for the commercial use of GM mustard for 4 years subject to certain field conditions.

GAEC had approved commercialisation of Bt Brinjal in 2007 but the then Minister of Environment declined to sign off the proposal due to strong protests

Arguments in favour of GM mustard

1. Better yields and are resistant to pests and diseases.
2. Biotechnology advancement – NITI Aayog in its draft 3 year action plan also supported introduction of GM crops
3. GM mustard, unlike Monsanto's Bt cotton, has been indigenously developed in the public sector by Delhi University-based Centre for Genetic Manipulation of Crop Plants.
4. GM oil imported - India imports thousands of tons of GM edible oil (and other GM food items) every year with no evidence of health effects or deaths due to genetic alterations.

Arguments against GM mustard

Sarson Satyagraha, a broad platform of hundreds of organisations representing farmers, consumers, scientists and others, and other such organizations has pointed a few drawbacks:

1. No knowledge of whether GEAC consists of any agricultural experts and representative of farmers
2. Use of GM mustard may increase chemicals in our food and farms.
3. Even 25% adoption of GM mustard will lead to loss of more than 4 crore employment days by poor women in mustard growing areas
4. Lack of transparency on effects of GM on human health, food chain, allied sectors
5. No indigenization - It is not "Swadeshi GM" as the genes used are the property of multinationals, which want to have control on seeds.
6. Farmers will be forced to buy seeds every season than using farm-saved seeds, affecting their profitability.

Q.18) What is integrated theatre command?

a) Modernisation and Digitisation of old cinema theatres of cultural importance
b) Computerised data bank of the available theatre buildings and spaces for performances
c) Unified command of the three Services, under a single commander, for geographical theatres that are of security concern.
d) Set of commands and instructions issued by Ministry of defence for all three services.

Q.18) Solution (c)

An integrated theatre command envisages a unified command of the three Services, under a single commander, for geographical theatres that are of security concern.

The commander of such a force will be able to bring to bear all resources at his disposal.

A committee appointed by the Defence Ministry, headed by Lt General D B Shekatkar (retd.) recommended creating 3 integrated theatre commands:

1. Northern command for the China border
2. Western command for the Pakistan border
3. Southern command for the maritime borders.

Source : http://indianexpress.com/article/explained/joint-operations-vs-integrated-command-understanding-a-new-way-to-fight-wars-4648574/

Q.19) Rajasthan Government has set up a captive breeding centre for Great Indian Bustard(GIB).
Consider the following statements

1. First Captive breeding centre for GIB was set up in Haryana in 2015
2. GIB is a flightless bird
3. GIB is listed as critically endangered in IUCN Red Data List

Which of the above statement[s] is/are correct?

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

Q.19) Solution (a)

The Rajasthan government will set up a captive breeding centre for the great Indian bustard. This will be the first such facility in the country aimed at saving the bird, which is the State bird of Rajasthan. Rajasthan accounts for 95% of the total world population of Great Indian bustard.

GIB is a large bird with a horizontal body and long bare legs giving it an ostrich like appearance. It is among the heaviest of the flying birds. Found in central India, western India and eastern Pakistan, it is categorized as Critically Endangered on the IUCN Red List

Source : http://www.thehindu.com/news/national/other-states/rajasthan-to-set-up-bustard-breeding-centre/article18350355.ece

Q.20) The Department of Telecom launched a portal to allow people to track radiation emitted from mobile towers within a locality. What is it called?

a) Kiran Sphuran
b) Tarang Sanchar
c) Kiran Pramaan
d) Tarang Path

Q.20) Solution (b)

The Department of Telecom launched a portal - Tarang Sanchar, a web portal for Information sharing on Mobile Towers and EMF Emission Compliances. It will help in clearing the myths and misconceptions of public on mobile towers and emissions from them. There are over 25,000 studies by WHO in the last 30 years on the subject and there is no proof that EMF radiation has any harmful effect on human health. In future, it will help in identifying the blind spots and it is also environment friendly as no paper work is required for this

Source : http://pib.nic.in/newsite/PrintRelease.aspx?relid=161464