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Q.1) *Pegasus* was seen recently in news. Which of the following describes its nature as a cybersecurity threat?

a) Trojan
b) Ransomware
c) Spyware
d) Phishing

Q.1) Solution (c)

Spyware – It is a kind of malware that is designed to collect information and data on users and observe their activity without users' knowledge.

Pegasus

- It is a spyware developed by the Israeli cyber arms firm NSO Group Technologies.
- It mainly uses exploit links, clicking on which install Pegasus on the target's phone.

Q.2) Which of the following statements are correct regarding Distributed Denial of Service attacks?

1. It is a malware which creates a botnet and use that to ping a server at the same time.
2. It corrupts all the files linked with a server and deletes them from the device.
3. It overburdens a server and leads to its crashing.

Select the code from following:

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

Q.2) Solution (c)

Distributed Denial Of Service

- A DDoS (Distributed Denial of Service) attack is an illegal large-scale cyber campaign where a big number of devices are used to create traffic to a certain server.
- If the number of devices involved is big enough, the overwhelming traffic would be more than what the targeted server is capable of handling.
- Malware first creates a network of bots — called a botnet — and then uses the botnet to ping a single server at the same time.
- In such a case, the server would get overburdened which would lead to crashes.
- After a successful DDoS attack, the customers of the service that had its servers targeted would not be able to use/access the said service due to the server crash triggered by the DDoS attacks

- Unlike other kinds of Cyberattack, DoS assaults don't attempt to breach the security perimeter. Rather, they aim to make the website and servers unavailable to legitimate users.

Q.3) 'Broadband Readiness Index for States' will be released by which of the organisation?

a) Niti Aayog
b) Department of telecommunication
c) Ministry in home affair in association with International Telecommunication Union.
d) NASSCOM

Q.3) Solution (b)

BROADBAND READINESS INDEX FOR STATES

- Department of Telecommunications and Indian Council for Research on International Economic Relations (ICRIER) have signed a MoU to develop a Broadband Readiness Index for Indian states and Union Territories (UT).
- The index will include indicators such as percentage of households using computers/ laptops with internet connection, percentage of households with fixed broadband connection, internet users as a percentage of the population, smartphones density, percentage of households with at least one digitally literate member, etc.

Q.4) Consider the following pair –

Index	Releasing authority
1. ICT Development Index	OECD
2. The Global Cyber Security Index	International Telecommunication Union
3. Global Information Technology Report	World Bank
4. Network Readiness Index	World Economic Forum

Which of the above pair/pairs have been correctly matched?

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

Q.4) Solution (c)

Index	Releasing authority
1. ICT Development Index	International Telecommunication Union
2. The Global Cyber Security Index	International Telecommunication

	Union
3. Global Information Technology Report	World Economic Forum
4. Network Readiness Index	World Economic Forum

Q.5) Which of the following describes the 'Wi-Fi calling', a new concept in communication technology?

a) Use of Wi-Fi router to directly make voice calls.
b) Integration of Wi-Fi Network with the concept of Internet of Things.
c) Use of high speed Internet connection to make and receive voice calls without using an app.
d) Expansion of public Wi-Fi to all public places.

Q.5) Solution (c)

Wi-Fi CALLING

- It makes use of high speed Internet connection, available via broadband, to make and receive high definition (HD) voice calls.
- This is not much different from a voice call using WhatsApp or any other over-the-top messaging platform, but here the **call is from one number to another, and not using an app**.
- Wi-Fi Calling can be configured on compatible smartphones by upgrading operating systems to the version that supports Wi-Fi Calling, and enabling this in Settings.
- Airtel says it will soon be compatible with all broadband services and Wi-Fi hotspots, and rolled out in other locations.

Q.6) Consider the following statements regarding Indian Cyber Crime Coordination Centre (I4C) –

1. It will be set up under the newly created Cyber and Information Security (CIS) division of the Ministry of Electronics and Information Technology.
2. The body will have power of surveillance of individual and institutions, subjected to the approval of cabinet secretary.

3. It has been created under Information Technology Act, 2000

Which of the statements given above is/are correct?

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

Q.6) Solution (d)

Statement 1 is incorrect - It will be set up under the newly created Cyber and Information Security (CIS) division of the **Ministry of Home Affair.**

Statement 2 is incorrect – It will act as a nodal point in the fight against cybercrime. However it has no power of surveillance against anyone.

Statement 3 is incorrect – It is not a statutory body.

INDIAN CYBER CRIME COORDINATION CENTRE (I4C)

- The Indian Cyber Crime Coordination Centre (I4C) was recently inaugurated by the government. It will be set up under the newly created Cyber and Information Security (CIS) division of the **Ministry of Home Affair.**

COMPONENTS

- National Cyber Crime Threat Analytics Unit
- National Cyber Crime Reporting Portal
- National Cyber Crime Training Centre
- Cyber Crime Ecosystem Management Unit
- National Cyber Crime Research and Innovation Centre
- National Cyber Crime Forensic Laboratory Ecosystem
- Platform for Joint Cyber Crime Investigation Team

Objectives:

1. To act as a nodal point in the fight against cybercrime
2. Identify the research problems/needs of LEAs and take up R&D activities in developing new technologies and forensic tools in collaboration with academia / research institutes within India and abroad
3. To prevent misuse of cyber space for furthering the cause of extremist and terrorist groups
4. Suggest amendments, if required, in cyber laws to keep pace with fast changing technologies and International cooperation
5. To coordinate all activities related to implementation of Mutual Legal Assistance Treaties (MLAT) with other countries related to cybercrimes in consultation with the concerned nodal authority in MHA.

Q.7) Which of the following statements most appropriately describes *Quantum supremacy*?

a) Explanation of physical phenomenon through quantum mechanics that otherwise cannot be done by classical mechanics.
b) Supremacy in financial sector due to fast communication bus.
c) Cyber capability, both offensive and defensive, of a nation.
d) Demonstrating that a quantum device can solve a problem that classical computers practically cannot.

Q.7) Solution (d)

Quantum Supremacy refers to a problem-solving process by the quantum computer that cannot be solved by a classical computer in its normal lifetime.

SYCAMORE

- Google announced that it had reached quantum supremacy and made quantum computer called Sycamore.
- Sycamore completed a task in 200 seconds that Google claimed would take a state-of-the-art supercomputer 10,000 years to finish.

Q.8) Which of the following statement is incorrect regarding quantum computers?

1. They do not follow classical physics like Newton's laws of motion.
2. It was posited by Richard Feynman
3. 'Mission on Quantum computing' under the 'National Supercomputing Mission' is led by Centre for Development of Advanced Computing, IISc and Department of Science and Technology (DST).

Select the correct option –

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

Q.8) Solution (d)

Statement 1 and 2 are correct as a matter of fact.

Statement 3 is incorrect as there is no such mission under National Supercomputing Mission.

QUANTUM COMPUTER

- Quantum computer runs on the laws of quantum physics as opposed to the classical computers (i.e. phones and laptops), which run on classical physics like Newton's laws of motion and utilizing the flow of electricity.
- It uses the laws that govern the behaviour of atoms and subatomic particles. At that tiny scale, many laws of classical physics do not apply, and the unique laws of quantum physics come into play.
- The quantum computer was posited by Richard Feynman.

Q.9) Consider the following statements regarding 'Open Application programming interfaces –

1. They provide an open architecture, allowing anyone to access data and functionality without any association with the API providers.
2. Government of India has open API policy for programmes like Aadhaar, eKYC, eSign, and Unified Payments Interface (UPI).

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

Q.9) Solution (c)

OPEN API (APPLICATION PROGRAMMING INTERFACES)

- They provide an open architecture, allowing any business to access data and functionality without any association with the API providers.
- Open APIs can bring in the profound changes in the overall digital ecosystem. Open APIs basically allow data to be accessible to larger institutions.
- Government of India has open API policy for programmes like Aadhaar, eKYC, eSign, and Unified Payments Interface (UPI) among others.
- Though Aadhaar data is handled by Unique Identification Authority of India (UIDAI) and banks have no control over the data, still banks are able to use the data. For instance, banks use Aadhaar-enabled biometric authentication to open bank accounts.
- An open API also gives banks the ability to monetize your data. But that doesn't mean all your information is made public. The data exchange in open APIs happens in a controlled manner.
- However, security does seem to be a concern with open APIs. Hence, not many banks currently offer them. But they are still works in progress and you can't rule out the possibility that someday, any bank would be able to fetch your data from any bank, of course, with your consent.

Q.10) Which of the following is/are statutory body formed under Information Technology act, 2000?

1. National Critical Information Infrastructure Protection Centre
2. Indian Computer Emergency Response Team – Cert-In
3. Data Security Council of India

Select the correct option –

a) 2 only

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

Q.10) Solution (b)

NATIONAL CRITICAL INFORMATION INFRASTRUCTURE PROTECTION CENTRE

- Established under Information Technology Act, 2000 to secure India's critical information infrastructure.
- It is designated as the National Nodal Agency in respect of Critical Information Infrastructure Protection.

INDIAN COMPUTER EMERGENCY RESPONSE TEAM – CERT-IN

- National nodal agency for responding to computer security incidents as and when they occur
- Under the Information Technology Amendment Act 2008, CERT- In has been designated to serve as the national agency to perform the following functions in the area of cyber security:
    1. Collection, analysis and dissemination of information on cyber incidents.
    2. Forecast and alerts of cyber security incidents
    3. Emergency measures for handling cyber security incidents
    4. Coordination of cyber incident response activities.
    5. Issue guidelines, advisories, vulnerability notes and whitepapers relating to information security practices, procedures, prevention, response and reporting of cyber incidents.
    6. Such other functions relating to cyber security as may be prescribed

DATA SECURITY COUNCIL OF INDIA

a) It is a not-for-profit premier industry body on data protection in India.
b) It has been setup by NASSCOM

Q.11) Lithium-ion battery is emerging as a promising technology for batteries. In this regard consider the following statements:

1. Lithium-ion batteries can handle hundreds of charge/discharge cycles.
2. Self-discharge is less than half compared to nickel-cadmium.
3. Faultily designed lithium-ion battery can turn into a miniature bomb.
4. India imports around 60% of Lithium-ion batteries from South America.

Which of the statements given above is/are correct?

a) 1 and 2 only
b) 1, 2 and 3 only
c) 1, 3 and 4 only

d) All of the above

Q.11) Solution (b)
Lithium-ion batteries (Nobel Chemistry 2019)

- Rechargeable, lightweight batteries.
- Lithium triangle–Majority of the world's lithium reserve are concentrated in lithium triangle countries Argentina, Bolivia, Chile (ABC countries – Mnemonics)

CHARACTERISTICS

- Light weight
- High energy density
- Safer energy-storage devices
- Low rate of self-discharge
- Low maintenance

India imports Li-ion batteries from China, Japan and South Korea and is among the largest importers in the world.
China dominates the Li-ion battery market. Around three-quarters of battery cell manufacturing capacity is in China, and Chinese companies have unparalleled control of required domestic and foreign battery raw materials and processing facilities.

Q.12) Which of the following is correct regarding DNA Data storage technology?

a) The Personal Data Protection Bill, 2018 will legalise its use.
b) CSIR has developed a prototype and dedicated it to the nation.
c) Use of DNA to store data as alternate data storage to binary data storage
d) History of genetic disorder in human beings can be traced using this technology

Q.12) Solution (c)
DNA DATA STORAGE

- Use of DNA to store data as alternate data storage to binary data storage.
- Encoding and decoding binary data to and from synthesized strands of DNA.
- An alternative to hard drives storage system is progressing in the form of DNA-based data storage.
- DNA—which consists of long chains of the nucleotides A, T, C and G—is life's information-storage material.
- Data can be stored in the sequence of these letters, turning DNA into a new form of information technology.
- It is already routinely sequenced (read), synthesized (written to) and accurately copied with ease. Currently 16 GB of text from Wikipedia has been encoded into synthetic DNA.

Q.13) Consider the following statements –

1. 'Paris Call' is an intergovernmental agreement on 'Trust and Security in Cyberspace'.
2. Cybersecurity Tech Accord is agreement among private tech companies.

Select the correct option –

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

Q.13) Solution (b)

Paris call

- 51 countries, 130 companies and 90 universities and non-governmental groups signed the 'Paris Call for Trust and Security in Cyberspace', a non-binding declaration initiated by President Macron, calling for protection from cyber-attacks.
- It aims to protect civilians, to keep external actors from interfering with elections, to preserve intellectual property etc.
- The US was one of the few Western nations who refused to sign the declaration.
- The Paris Call has been likened to a digital version of the Geneva Convention and praised as an important step for democracy.

Cybersecurity Tech Accord

- A group of 34 major tech companies, including Cisco, Facebook, Microsoft, HP, RSA, and Oracle, have signed the Cybersecurity Tech Accord.
- This accord promises to establish partnerships to share vulnerabilities, provide consumers with better ways to protect themselves, and refuse to assist governments in carrying out state sponsored cyber-attacks.

Q.14) Consider the following statements regarding National Supercomputing Mission –

1. It is jointly steered by MEITY and Department of Science and Technology (DST).
2. The mission was started during the tenure of Prime Minister Rajiv Gandhi.
3. So far 70 supercomputers have been integrated into the National Knowledge Network.

Select the correct option –

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

Q.14) Solution (b)

Statement 1 is correct

Statement 2 is incorrect – India's supercomputer program was started in late 1980s because Cray supercomputers could not be imported into India due to an arms embargo imposed on India, as it was a dual-use technology and could be used for developing nuclear weapons. However The National Supercomputing Mission was announced in March 2015.

Statement 3 is incorrect – installation of vast supercomputing grid comprising of 70 high performance computing facilities is the aim of the mission. Not achieved yet.

NATIONAL SUPERCOMPUTING MISSION

- Jointly steered by MEITY and Department of Science and Technology (DST).
- Implemented by Centre for Development of Advanced Computing (CDAC) and IISc.
- Aims to empower our national academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of 70 high performance computing facilities.
- The target of the mission was set to establish a network of supercomputers ranging from a few Tera Flops (TF) to Hundreds of Tera Flops (TF) and three systems with greater than or equal to 3 Peta Flops (PF) in academic and research institutions of National importance across the country by 2022.
- The first supercomputer assembled indigenously, called Param Shivay, was installed in IIT (BHU).
- Similar systems Param Shakti and Param Brahma were installed at IIT-Kharagpur and IISER, Pune. They are equipped with applications from domains like Weather and Climate, Computational Fluid Dynamics, Bioinformatics, and Material science.
- These supercomputers will also be networked on the National Supercomputing grid over the National Knowledge Network.

SHAKTI PROCESSOR PROGRAM

- India's first indigenously developed microprocessor that can be used in mobile computing, networking, wireless systems, and may be even for country's nuclear systems.
- Developed and booted by Indian Institute of Technology Madras.
- Note: India's first Indigenous Semiconductor Chips by Bengaluru based semiconductor company Signalchip for 4G/LTE and 5G

Q.15) Which of the following statements regarding 'Quantum Dots' are correct?

1. Quantum dots display unique electronic properties, intermediate between those of bulk semiconductors and discrete molecules.

2. They can be made to emit or absorb specific wavelengths of light by controlling their size.
3. They are nontoxic and can be injected in the blood stream and help in detecting the cancer cells present in body by illuminating them under an MRI.

Select the code from following

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

Q.15) Solution (a)

- Nanoparticles of semiconductors – quantum dots – were theorized in the 1970s and initially created in the early 1980s. If semiconductor particles are made small enough, quantum effects come into play, which limit the energies at which electrons and holes (the absence of an electron) can exist in the particles. As energy is related to wavelength (or color), this means that the optical properties of the particle can be finely tuned depending on its size. Thus, particles can be made to emit or absorb specific wavelengths (colors) of light, merely by controlling their size.
- Quantum dots are artificial nanostructures that can possess many varied properties, depending on their material and shape. For instance, due to their particular electronic properties they can be used as active materials in single-electron transistors.
- The properties of a quantum dot are not only determined by its size but also by its shape, composition, and structure, for instance if it's solid or hollow. A reliable manufacturing technology that makes use of quantum dots' properties – for a wide-ranging number of applications in such areas as catalysis, electronics, photonics, information storage, imaging, medicine, or sensing – needs to be capable of churning out large quantities of nanocrystals where each batch is produced according to the exactly same parameters.
- Quantum dots enable researchers to study cell processes at the level of a single molecule and may significantly improve the diagnosis and treatment of diseases such as cancers. QDs are either used as active sensor elements in high-resolution cellular imaging, where the fluorescence properties of the quantum dots are changed upon reaction with the analyte, or in passive label probes where selective receptor molecules such as antibodies have been conjugated to the surface of the dots.
- Quantum dots could revolutionize medicine. Unfortunately, most of them are toxic. Ironically, the existence of heavy metals in QDs such as cadmium, a well-established human toxicant and carcinogen, poses potential dangers especially for future medical application, where Q-dots are deliberately injected into the body.

- Union telecom ministry had announced 5G technology will be rolled out from 2020.

Q.16) 5G is a wireless communication technology and the next generation mobile networks technology after 4G LTE networks. Which of the following statements regarding 5G technology are correct?

1. It will provide 100 times more peak speed as compared to 4G.
2. The speed provided by 5G will be faster than current broadband cable network.
3. It will be able to support large number of interconnected devices making internet of things successful.

Select the code from following:

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

Q.16) Solution (d)

- 5G is the fifth generation wireless network which promises ultra-reliable, very fast speeds and high bandwidth mobile connectivity and supports massive interconnected devices spread across wide areas like Internet of things (IoT). It made the worldwide debut in the winter Olympics at Pyeongchang, South Korea.
- Their major advantage is that 5G networks achieve much higher data rates than previous cellular networks, up to 10 Gbit/s; which is faster than current cable internet, and 100 times faster than the previous cellular technology, 4G LTE.
- Another advantage is lower network latency (faster response time), below 1 ms (millisecond), compared with 30 – 70 ms for 4G. Because of the higher data rates, 5G networks will serve not just cellphones but are also envisioned as a general home and office networking provider, competing with wired internet providers like cable. Previous cellular networks provided low data rate internet access suitable for cellphones, but a cell tower could not economically provide enough bandwidth to serve as a general internet provider for home computers.

Q.17) Consider the following statements regarding 'Cyber Surakshit Bharat' Initiative:

1. It has been launched by Ministry of Home Affairs with National e – Governance Division and Industry Partners.
2. Cyber Surakshit Bharat will be operated on the three principles of Awareness, Education and Enablement.
3. Cyber Surakshit Bharat is a public-private partnership and will leverage the expertise of the IT industry in cybersecurity.

Which of the above statements are correct?

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

Q.17) Solution (d)

Cyber Surakshit Bharat

- Ministry of Electronics and Information Technology (MeitY), announced the Cyber Surakshit Bharat initiative in association with National e-Governance Division (NeGD) and industry partners
- An aim of the initiative is to spread awareness about cybercrime and building capacity for safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments.
- Cyber Surakshit Bharat will be operated on the three principles of Awareness, Education and Enablement.
- It will include an awareness program on the importance of cybersecurity; a series of workshops on best practices and enablement of the officials with cybersecurity health tool kits to manage and mitigate cyber threats.
- Cyber Surakshit Bharat is the first public-private partnership of its kind and will leverage the expertise of the IT industry in cybersecurity.

Q.18) Consider the following statements:

1. TRAI is the authority to decide on matter of net-neutrality in India.
2. Reserve price, the highest price cap that is placed over spectrum above which it cannot be sold, is recommended by TRAI.

Which of the statements given above is/are correct?

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

Q.18) Solution (b)

NET NEUTRALITY

- Net neutrality is the principle that internet service providers and governments regulating the internet should treat all data on the internet the same, and not discriminating or charging differentially on the basis of user, content, website, platform, application, type of attached equipment, or mode of communication.
- In 2016, TRAI took a revolutionary decision, prohibiting telecom service providers from levying discriminatory rates for data, thus ruling in favour of Net Neutrality in India. This move was welcomed by not just by millions of Indians but also by various political parties, businesspersons, and industry leaders.
- **However Department of Telecommunications approves net neutrality rules.**

RESERVE PRICE

It is the minimum amount set by the government from which auction starts i.e. it is the starting amount or base price from which auction starts. Reserve price is recommended by TRAI.

Why auction of spectrum is done?

- Spectrum is a scarce resource. It needs to be managed efficiently.
- Also, spectrum can't be used by many people. It has to be allocated to some persons who can manage the services under it. Hence it is auctioned.
- Government auctions it because spectrum is a resource & the ownership rights for it are vested in the Government of India. It is not a private property. So, government auctions it.
- Also, a lot of revenue is generated by selling the spectrum. That money can be used for developmental programs in India.

Q.19) Which of the following statements are correct regarding RFID tags?

1. These tags contain electronically stored information.
2. Like a barcode, the tag should be within the line of sight of the reader
3. RFID provides a way for organizations to identify and manage stock, tools and equipment (asset tracking), etc. without manual data entry.

Select the code from following:

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

Q.19) Solution (c)

RFID

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored information.
Passive tags collect energy from a nearby RFID reader's interrogating radio waves.
Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader.
Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).
RFID can be used in a variety of applications, such as:

- Electronic key for RFID based lock system
- Access management
- Tracking of goods
- Tracking of persons and animals
- Toll collection and contactless payment
- Machine readable travel documents
- Smartdust (for massively distributed sensor networks)
- Airport baggage tracking logistics
- Timing sporting events
- Tracking and billing processes

RFID provides a way for organizations to identify and manage stock, tools and equipment (asset tracking), etc. without manual data entry.
RFID is used for item level tagging in retail stores. In addition to inventory control, this provides both protection against theft by customers (shoplifting) and employees ("shrinkage") by using electronic article surveillance (EAS), and a self-checkout process for customers.
Yard management, shipping and freight and distribution centers use RFID tracking. In the railroad industry, RFID tags mounted on locomotives and rolling stock identify the owner, identification number and type of equipment and its characteristics. This can be used with a database to identify the lading, origin, destination, etc. of the commodities being carried.

Q.20) With the boom of the bitcoin – a variety of cryptocurrency – the blockchain technology has come into prominence. What does this technology promise to do, even though it is still in its infancy?

a) Help facilitate secure, online transactions in a decentralized way
b) Keep out malware
c) Connect servers with common reasons for existence, remotely
d) All of the above

Q.20) Solution (a)

Blockchain is the backbone technology on which bitcoins run. Simply put, it is a digital public ledger that records every transaction. Once a transaction is entered in the blockchain, it cannot be erased or modified. Blockchain removes the need for using a trusted third party such as a bank to make a transaction by directly connecting the customers and suppliers.

Each transaction is recorded to the ledger after verification by the network participants, mainly a chain of computers, called nodes.

While the origin of the technology is not clear, it is widely believed that a person or group of people by the pseudonym Satoshi Nakamoto, who invented bitcoins, released the technology to support cryptocurrency.

Bitcoin is just one of the applications for the technology, whose use is being tested across industries. It is witnessing a lot of traction within India, in sectors such as banking and insurance. In most of these industries, players are coming together to form a consortium to realise the benefits of blockchain at an industry level.

For example, in India, there is a consortium 'BankChain' which has about 27 banks from India (including State Bank of India or SBI and ICICI) and the Middle East as its members. The consortium is exploring using usage of Blockchain technology to make business safer, faster and cheaper.

The Institute for Development and Research in Banking Technology (IDRBT), an arm of the Reserve Bank of India (RBI), is developing a model platform for blockchain technology Blockchain is expected to improve the efficiency of a transaction by eliminating the middlemen, while also reducing the cost of all transactions. It is also likely to increase transparency and bring down fraud as every transaction would be recorded and distributed on a public ledger.

Q.21) Consider the following statements about the Coronavirus:

1. It is zoonotic in nature.
2. Middle-East Respiratory Syndrome (MERS) is also caused by coronavirus.
3. Almost everyone gets a coronavirus infection at least once in lifetime.
4. It is RNA based Virus.

Which of the statements given above are correct?

a) 1 and 4 only
b) 1 and 2 only
c) 1, 2 and 4 only
d) All of the above

Q.21) Solution (d)

CORONAVIRUS

- Large family of viruses, first identified in the 1960s.
- Can infect both animals and humans.
- It causes illness ranging from the common cold to more severe respiratory illness like **SARS & MERS. (Hence Statement 2 is correct).**

- Almost everyone gets a coronavirus infection at least once in their life, most likely as a young child. **(Hence Statement 3 is correct).**

NOVEL CORONAVIRUS – COVID-19

- A new strain that has not been previously identified in humans.
- First detected in Wuhan, China.
- Relative of SARS
- The novel coronavirus like any other **corona virus has its genetic material as a single-stranded RNA**. **(Hence Statement 4 is correct)**
- The challenge with RNA virus as compared to DNA virus is that RNA viruses are prone to quick changes and thus continuously mutating into new forms.

TRANSMISSION

- These viruses are **zoonotic** – transmitted from animals to humans. **(Hence Statement 1 is correct)**
- Human-to-Human: Mother to baby: Breastfeeding and placenta
- WHO has named the new coronavirus disease as 'Covid-19'
- Remdesivir: An anti-viral drugs under trials in Wuhan 2019

Q.22) Consider the following statements with regard to virus -

1. All viruses have an outer lipid layer that protects them when they are outside the cell.
2. Coronavirus has different structure than rotavirus.
3. Virus is not a living entity.
4. Viruses have RNA as the nuclear material and completely lack DNA.

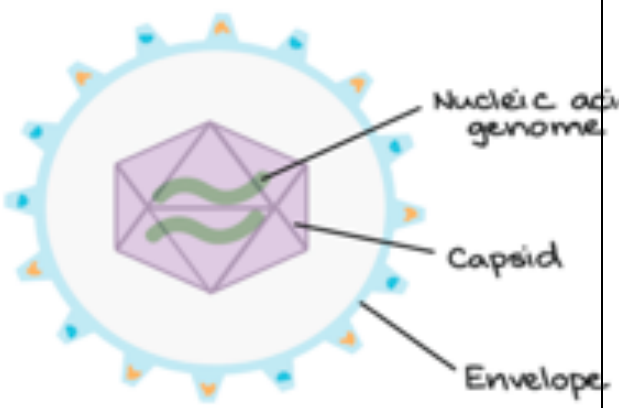
Select the correct option -

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

Q.22) Solution (b)

Basics of Virus

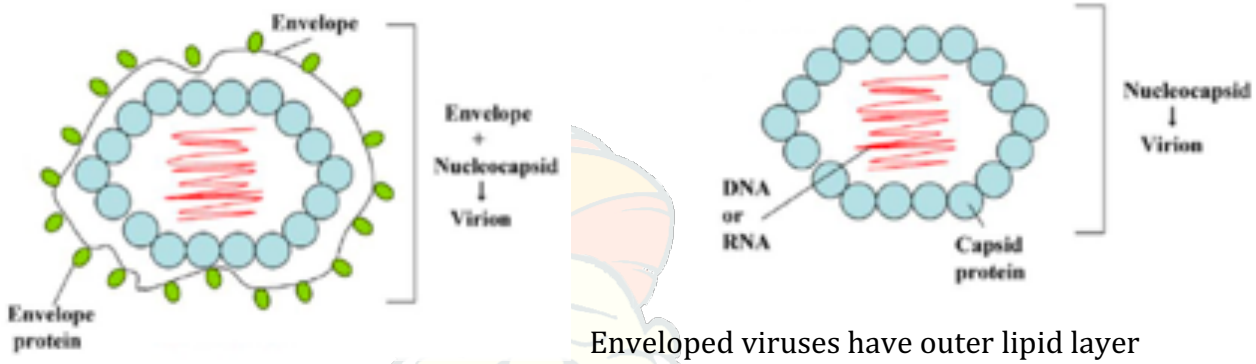
- Virus does not have DNA producing machinery. So it enters into the cell and uses the machinery of the cell. It does so by reprogramming the host DNA instead of producing its own DNA cell.



- Because they can't reproduce by themselves, viruses are not considered living. **(Hence Statement 3 is correct)**
- Viral particles consist of two or three parts:
  - **<u>the genetic material made from either DNA or RNA. (Hence Statement 4 is incorrect)</u>**
  - a protein coat, called the capsid, which surrounds and protects the genetic material
  - an envelope of lipids that surrounds the protein coat when they are outside a cell

Virus could be Enveloped viruses and naked virus depending on presence and absence of outer lipids layer. **(Hence Statement 1 is incorrect)**

<u>Enveloped viruses and naked virus</u>



Enveloped viruses have outer lipid layer of glycoprotein and lipoproteins (envelop). They can only survive under special conditions ("wet conditions") and they are generally transmitted in "wet" body fluids, like blood or respiratory droplets. Naked viruses can survive under harsh conditions.
The protein capsid of naked viruses is less susceptible to environmental conditions (lipid solvents, pH, temperature etc) than enveloped viruses. Example of naked virus – **norovirus, rotavirus, Human papillomavirus (HPV) and polio** etc **(Hence Statement 2 is correct)**

Function of the envelope

- Protection against the host immune system (as these membranes are usually obtained from host cells)
- Receptors usually located on that envelop which recognize the host cells.
- Contain ligands helping in the attachment to the host cell surface
- These membranes are also effectively infused to the cell membrane and release the core of virus or its genetic material into the cell.

Thus, **losing the membrane will impair the infectivity of the virus.**
<u>Coronaviruses (including COVID-19) have a lipid membrane that makes up their outer coating</u>.

Q.23) Consider the following statements with regard to m-RNA Vaccine –

1. It triggers the body into producing some of the viral proteins itself.

2. It was first approved for Polio.
3. It could also trigger the innate immune system.
4. It will be easier and quicker to produce than traditional vaccines.

Select the correct option –

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

Q.23) Solution (c)

Note – a number of RNA vaccines are under development to combat the 2019–20 coronavirus pandemic. This is a very important topic for coming prelims examination.

What is m-RNA?

- Every cell in an organism contains all of the information needed to manufacture every protein in its body.
- The DNA is the storehouse of information, an instruction book to build these proteins.
- The message to build these proteins from DNA to the cytoplasm of the cell is carried by a middle man called m-RNA.

m-RNA based Vaccines

A vaccine basically trains the immune system to recognize parts of a virus (antigen) and fight it before it enters the cell.

An RNA vaccine is a novel type of vaccine which is composed of the nucleic acid RNA, packaged within a vector such as lipid nanoparticles.

Traditional vaccines are made up of small or inactivated doses of the whole disease-causing organism, or the proteins that it produces, which are introduced into the body to provoke the immune system into mounting a response.

mRNA vaccines, in contrast, trick the body into producing some of the viral proteins itself. They work by using mRNA, or messenger RNA, which is the molecule that essentially puts DNA instructions into action. Inside a cell, mRNA is used as a template to build a protein. 'An mRNA is basically like a pre-form of a protein and its (sequence encodes) what the protein is basically made of later on. **(Hence Statement 1 is correct)**

To produce an mRNA vaccine, scientists produce a synthetic version of the mRNA that a virus uses to build its infectious proteins. This mRNA is delivered into the human body, whose cells read it as instructions to build that viral protein, and therefore create some of the virus's molecules themselves. These proteins are solitary, so they do not assemble to form a virus. The immune system then detects these viral proteins and starts to produce a defensive response to them.

There are two parts to our immune system: **innate** (the defenses we're born with) and **acquired** (which we develop as we come into contact with pathogens). Classical vaccine molecules usually only work with the acquired immune system and the innate immune system is activated by another ingredient, called an adjuvant. Interestingly, **mRNA in vaccines could also trigger the innate immune system**, providing an extra layer of defence without the need to add adjuvants. **(Hence Statement 3 is correct)**
All kinds of innate immune cells are being activated by the mRNA. This primes the immune system to get prepared for an endangering pathogen and thus the type of immune response that is triggered is very strong.
And **by getting the human body to produce the viral proteins itself, mRNA vaccines cut out some of the manufacturing process** and should be easier and quicker to produce than traditional vaccines. **(Hence Statement 4 is correct)**

So far, no such vaccine has been licensed for infectious disease. (Hence Statement 2 is incorrect)

Q.24) Hydroxy-chloroquine drug, recently in news, is most commonly used to treat which of the following disease?

a) Tuberculosis
b) Malaria
c) Typhoid
d) AIDS

Q.24) Solution (b)
The medicine is used to treat **malaria** and lupus.
The National Task Force COVID-19 constituted by Indian Council of Medical Research (ICMR) recommended the use of hydroxy-chloroquine for the treatment of COVID-19 for high-risk cases.

Q.25) In which of the following ways hand sanitizers protect against viral infection?

1. Denaturation of protein structures that stick out of the lipid structure
2. Dissolving the outer lipid layer
3. Stressed mutation of the virus
4. Dissolution of protective protein called capsid

Select the correct option -

a) 1 and 2 only
b) 1, 2 and 3 only
c) 1, 2 and 4 only
d) All of the above

Q.25) Solution (a)

How do hand sanitizers work?

- The most feasible explanation is denaturation of protein structures that stick out of the lipid structure. It also dissolves the lipid envelope. **(Hence Statement 1 and 2 are correct)**
- For a virus, sanitizers also work by disrupting the virus's outer coat. [However, they are not effective against viruses that do not have these coatings, norovirus, rotavirus, Human papillomavirus (HPV) and polio etc]
- For a bacterium, they work by disrupting its cell membrane.
- WHO recommends hand sanitizer that has at least 60 percent alcohol.

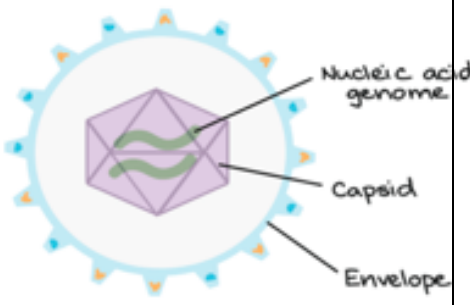
Advantages of hand sanitizers

- The bacteria it kills don't develop a resistance to it, so alcohol doesn't lose effectiveness with continued use.
- Ethanol is so powerful that in high concentrations, it's better at getting rid of—Escherichia coli, Serratia marcescens and Staphylococcus saprophyticus — compared with washing hands with regular or antibacterial soap.

Limitation of hand sanitizers

- Alcohol doesn't work for all germs, such as norovirus; Clostridium difficile, which can cause life-threatening diarrhea; or Cryptosporidium, a parasite that causes a diarrheal disease.
- Hand sanitizers also don't remove harmful chemicals like pesticides or heavy metals, nor does hand sanitizer work well on especially dirty or greasy hands.
- Swallowing alcohol-based hand sanitizers can cause alcohol poisoning.

Statement 3 is too farfetched and should be eliminated by common sense.
Statement 4 is incorrect – capsid is the inner layer in the structure of the virus. Only the outer layer gets dissolved.



Q.26) Consider the following pairs of diseases and affected plants:

Diseases	Plant
1. Yellow rust	Wheat
2. Fall armyworm	Rice
3. Pink bollworm	Cotton
4. Sheath blight disease	Maize

Which of the above pairs have been correctly matched?

a) 1 only
b) 1 and 3 only

c) 1, 2 and 3 only
d) All of the above

Q.26) Solution (b)

YELLOW RUST

- It is a fungal disease which turns crop's leaves yellowish and stops photosynthesis activity.
- It is one of the three wheat rust diseases principally found in wheat grown in cooler environments (northern latitudes or cooler seasons)

FALL ARMYWORM

- Invasive Specie
- Spodoptera frugiperda is a species in the larval life stage of a fall armyworm moth.
- Native of America
- First detected in Karnataka this year (now has spread to W. Bengal and Gujarat)
- Attacks crops particularly maize.

PINK BOLLWORM

- Infects cotton
- BT cotton grown in India is genetically modified for developing resistance to the pink bollworm pest in the crop.
- This is done by inserting 'Cry1Ab' and 'Cry2Bc' genes from the soil bacterium, Bacillus thuringiensis (Bt), into the cotton seed.

SHEATH BLIGHT DISEASE

- Disease in rice
- Fungal disease
- Decreases the yield by 60%

Q.27) Recently there was widespread attack of locust in India. Consider the following statements about locust:

1. They have strong powers of flight, going from one continent to another.
2. They attack maize crop only.
3. Grasshoppers can get stressed and transformed into locusts.

Select the correct option using the codes given below

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

Q.27) Solution (c)

LOCUST

- A locust is a large, mainly tropical grasshopper with strong powers of flight (unlike ordinary grasshoppers)
- Under dry and stressful condition grasshoppers are getting stressed and transformed into locusts.
- Only four species of locusts are found in India
    - Desert locust
    - Migratory locust
    - Bombay Locust
    - Tree locust
- Locust adults can eat their own weight every day, posing huge threat to food security.

Q.28) Consider the following statement with respect to antimicrobial resistance:

1. India is a member of Global Antimicrobial Resistance Surveillance System (GLASS) launched by WHO.
2. Genetic predisposition of some people also may cause antimicrobial resistance.
3. Kerala is the first state to develop an action plan to manage antimicrobial resistance.

Select the correct option using the codes given below

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

Q.28) Solution (d)

GLOBAL ANTIMICROBIAL RESISTANCE SURVEILLANCE SYSTEM (GLASS)

- WHO system launched in 2015
- Aim: Support global surveillance and research in order to strengthen the evidence base on antimicrobial resistance (AMR) and help informing decision-making and drive national, regional, and global actions.
- **India has enrolled to GLASS system.**

NATIONAL ACTION PLAN TO COMBAT ANTIMICROBIAL RESISTANCE 2017

- Adopted by Delhi declaration
- Objectives
    - enhancing awareness
    - strengthening surveillance
    - improving rational use of antibiotics
    - reducing infections
    - promoting research

- In addition, support to neighbouring countries in collective fight against infectious diseases.
- **Kerala, followed by Madhya Pradesh, has developed an state-level action plan to manage antimicrobial resistance (AMR).**

Q.29) What is Candida auris that was recently in news?

a) An arterioid
b) Man-made mineral
c) Multidrug-resistant fungus
d) Yeast cultivated for food security

Q.29) Solution (c)

CANDIDA AURIS

- Multidrug-resistant fungus (yeast)
- It can cause many different types of infections such as bloodstream infection, wound infection, ear infection etc.

Q.30) Consider the following statements about TrueNat that was in news recently?

1. TrueNat can be used to detect multi-drug resistant TB strain too.
2. Diagnosis of TB becomes cheaper and faster with TrueNat compared to existing molecular diagnostic testing tool.

Select the correct option using the codes given below

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

Q.30) Solution (c)

TRUENAT

WHO has endorsed TrueNat, an indigenous molecular diagnostic tool for TB.

- Early diagnosis is extremely important in fighting TB.
- Widely followed diagnosis methods include Sputum smear microscopy which studies phenotype of the pathogen from the sputum sample of the infected patient.
- However studying the phenotype makes this method less sensitive as it cannot detect drug-resistant pathogen.
- On the other hand molecular studies have enabled study of genotype of the pathogen resulting in detection of drug resistant strain.

COMPARISON BETWEEN Genexpert AND TrueNat

PARAMETERS	GENEXPERT	TRUENAT
Sensitivity and Specifity	Same	Same
Time required	More time	Less Time
Airconditioning	Required	Not Required
Power	Continuous Electricity Supply	Battery operated
Cost advantage	Expensive as test for MDR TB and TB	Cheaper since second test for MDR TB is

- While sputum microscopy has only about 50% sensitivity, Molecular Test has been found to have higher sensitivity upto 89%.
- Currently Genexpert is the molecular diagnostic test commonly used. However, it is run on electricity and air-conditioned atmosphere. The advantage of TrueNat over GeneExpe
- TrueNat is portable as it is battery operated.

Q.31) Which of the following is not a benefit of seaweeds, from the point of view of health and nutrition?

a) Edible Seaweeds are high-calorie nutrient-dense food items.
b) They are rich in vitamins A and C.
c) They are a good source of minerals such as Ca, Mg, Zn, Se and Fe.
d) They also have a high level of vegetable proteins and omega 3 and 6 fatty acids.

Q.31) Solution (a)

SEAWEEDS: A SOLUTION TO HUNGER

- Also called brown algae
- Multi-cellular photosynthetic eukaryotes.
- Very similar to plants, the only difference being they live only in water or on very moist land surfaces, in other words they grow in the tidal zone.
- Exhibit highest photosynthesis efficiency due to moist conditions.
- As a result they contribute to about 50% of all photosynthesis in the world.

ADVANTAGES OF EDIBLE SEAWEED

- **Low-calorie** and nutrient-dense food items. **(Hence statement 1 is incorrect)**
- Rich in vitamins A and C.
- Good source of minerals such as Ca, Mg, Zn, Se and Fe.
- High level of vegetable proteins and omega 3 and 6 fatty acids.
- Since Seaweeds live in water they do not require irrigation.
- They do not require pesticides, fertilizers.

Q.32) Which of the following benefit can come out of our understanding of human genome sequence?

1. Genetic disorders like cystic fibrosis or sickle cell anemia can be identified.
2. Personalized medication can be prescribed.
3. Treatments for common cancers can be developed.

Select the correct option using the codes given below

a) 1 only
b) 1 and 2 only

c) 1 and 3 only
d) All of the above

Q.32) Solution (d)

Genome sequencing is figuring out the order of DNA nucleotides, or bases, in a genome—the order of As, Cs, Gs, and Ts that make up an organism's DNA. The human genome is made up of over 3 billion of these genetic letters. In a sense, a genome sequence is simply a very long string of letters in a mysterious language.

The genetic maps form the basis of positional cloning, the ability to isolate disease genes based on patterns of inheritance. This will help in identification of genetic disorders like cystic fibrosis or sickle cell anaemia. Using gene editing technique such diseases can also be treated. (Hence statement 1 is correct)

Personalized medicine is an emerging practice of medicine that uses an individual's genetic profile to guide decisions made in regard to the prevention, diagnosis, and treatment of disease.

Genomics is playing a big role in the emergence of personalized medicine, because it gives us a window in a very specific molecular way into those differences between us and allows the opportunity for making individual predictions about disease risk that can help somebody choose a prevention plan that is right for them. It also allows the possibility in some instances of picking the right drug at the right dose for the right person instead of the "one size fits all" approach to drug therapy. (Hence statement 2 is correct)

Whole genome sequencing of tumour cells could help predict the prognosis of a patient's cancer and offer clues to identify the most effective treatment. (Hence statement 3 is correct)

Q.33) Consider the following statements regarding National Stem Cell Registry:

1. It comes under the ageis of Ministry of Science & Technology.
2. A person enrolling for Pradhan Mantri Jan Arogya Yojana will be automatically enrolled in National Stem Cell Registry.
3. It will help in treating patients with blood-related disorders.

Which of the statements given above is/are correct?

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

Q.33) Solution (c)

NATIONAL STEM CELL REGISTRY

- India is developing a National Stem Cell Registry of its own.
- **It is an initiative of Ministry of Health and Family Welfare. (Hence statement 1 is incorrect)**
- It is a government managed database of unrelated bone marrow donors.

- Main aim is to find matching donors for treating patients with **blood-related disorders** such as
    - blood cancers (lymphoma, leukemia)
    - thalassaemia,
    - sickle-cell anaemia,
    - haemophilia

  (Hence statement 3 is correct)

- **The registration to the database is voluntary. (Hence statement 2 is incorrect)**

IMPORTANCE

- About 3.5-5Lakh people in India suffer from blood-related disorders like thalassaemia which require frequent blood transfusions. The only cure for blood related disorders is bone-marrow transplantation.
- Matching Donors can be found with ease.
- For bone-marrow transplantation, the donor and patient should have exactly the same white blood cell type.
- Siblings usually have the exact match and thus suitable for bone-marrow transplantations.
- Thus matching donors is extremely low and the database will help connect unrelated matching donors

Q.34) Consider the following statement with regard to World Health Organisation (WHO) –

1. It is an intergovernmental body with headquarter in Geneva, Switzerland.
2. It reports to the Economic and Social Council.
3. Any new disease is named by WHO only.

Select the correct option –

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

Q.34) Solution (b)

World Health Organization (WHO)

- The United Nations' specialized agency for Health was founded in 1948.
- Its headquarters are situated **in Geneva, Switzerland.**
- There are 194 Member States, 150 country offices, six regional offices.

- It is an inter-governmental organization and works in collaboration with its member states usually through the Ministries of Health.
- The WHO provides leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.
- In 1997, WHO rolled out the Global Public Health Intelligence Network (GPHIN), which took advantage of information on the Internet to function as an early warning system for potential epidemics.

World Health Assembly

- It is the decision-making body of WHO
- Each Member is represented by not more than three delegates, one of whom is designated by the Member as chief delegate.
- The Health Assembly determines the policies of the Organization, supervises the financial policies, reviews and approves the budget.
- It reports to the Economic and Social Council in accordance with any agreement between the Organization and the United Nations.

WHO and India

- India became a party to the WHO on 12 January 1948.
- Regional office for South East Asia is located in New Delhi.
- In 1967, the WHO launched the Intensified Smallpox Eradication Programme. With a coordinated effort by Indian government with the World Health Organization (WHO), smallpox was eradicated in 1977.
- India began the battle against the disease in response to the WHO's 1988 Global Polio Eradication Initiative with financial and technical help from World Bank.
- The WHO Country Cooperation Strategy – India (2012-2017) has been jointly developed by the Ministry of Health and Family Welfare (MoH&FW) and the WHO Country Office for India (WCO).

WHO came up with the new guidelines in May 2015. The WHO identified the best practices to name new human diseases in consultation and collaboration with the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO). The main aim behind this exercise was to "minimise unnecessary negative impact of disease names on trade, travel, tourism or animal welfare, and avoid causing offence to any cultural, social, national, regional, professional or ethnic groups".

According to the guidelines, name of a new disease should consist of a combination of terms. These terms consist of a generic descriptive term based on clinical symptoms (respiratory), physiological processes (diarrhoea), and anatomical or pathological references (cardic). It can refer to specific descriptive terms such as those who are

afflicted (infant, juvenile, and maternal), seasonality (summer, winter) and severity (mild, severe). The name can also include other factual elements such as the environment (ocean, river), causal pathogen (coronavirus) and the year the new disease is first detected with or without mentioning the month.
The year is used when it becomes "necessary to differentiate between similar events that happened in different years". In the case of COVID-19, coronavirus has caused other diseases such as the Severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS).

Q.35) Moscow declaration recently seen in news is related to which of the following?

a) Multi Drug Resistance
b) Malaria Elimination
c) Non communicable diseases
d) Global TB response

Q.35) Solution (d)

MOSCOW DECLARATION

- Global commitment to end TB by 2030
- Adopted at 1st WHO Global Ministerial Conference on Ending Tuberculosis in 2017

Q.36) Which of the following statements is/are correct regarding the Global Antimicrobial Resistance (AMR) Research and Development (R&D) Hub?

1. It is European Union led initiative
2. It is an initiative to tackle the threat of resistant pathogens.
3. India is a member, represented by Ministry of Health and Family Welfare.

Select the correct answer using the code given below:

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

Q.36) Solution (b)

India has recently joined the Global Antimicrobial Resistance (AMR) Research and Development (R&D) Hub as a new member.
India is represented by department of Biotechnology, Ministry of Science & Technology in New Delhi.
The Global AMR R&D Hub was launched in 2018 in the margins of the World Health Assembly, following a call from G20 Leaders in 2017.

The Global AMR R&D Hub supports global priority setting and evidence-based decision-making on the allocation of resources for AMR R&D through the identification of gaps, overlaps and potential for cross-sectoral collaboration and leveraging in AMR R&D.
The operation of the Global AMR R&D Hub is supported through a Secretariat, established in Berlin and currently financed through grants from the German Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Health (BMG).

Q.37) Consider the following statements:

1. It is an initiative of the Public Health Foundation of India to eliminate malaria from India by 2030.
2. There is no vaccine against malaria.

Which of the statements given above is/are correct?

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

Q.37) Solution (d)

MOSQUIRIX is the 1st ever vaccine against malaria **(Hence statement 2 is incorrect)**
Note: At the East Asia Summit in 2015, India pledged to eliminate the disease by 2030. Following this public declaration, India launched the five-year National Strategic Plan for Malaria Elimination. This marked a shift in focus from malaria "control" to "elimination".

MERA INDIA INITIATIVE

- Launched by ICMR to eliminate malaria by 2030. **(Hence statement 1 is incorrect)**
- Malaria Elimination Research Alliance (MERA) India – a conglomeration of partners working on malaria control – in order to prioritise, plan and scale up research to eliminate the disease from India by 2030
- Malaria is the most deadly vector-borne disease.
- Malaria is caused by a Plasmodium Parasites that is transmitted from one human to another by the bite of infected Anopheles mosquitoes.

E-2020 INITIATIVE

It is part of the Global Technical Strategy for Malaria 2016- 2030 endorsed by WHO.

Q.38) India has collaborated with which of the following for **New Influenza Research Programme**?

a) Japan
b) USA
c) European Union
d) Russia

Q.38) Solution (c)

Indian and European Union collaborated for new influenza research programme to develop Next Generation Influenza Vaccine.

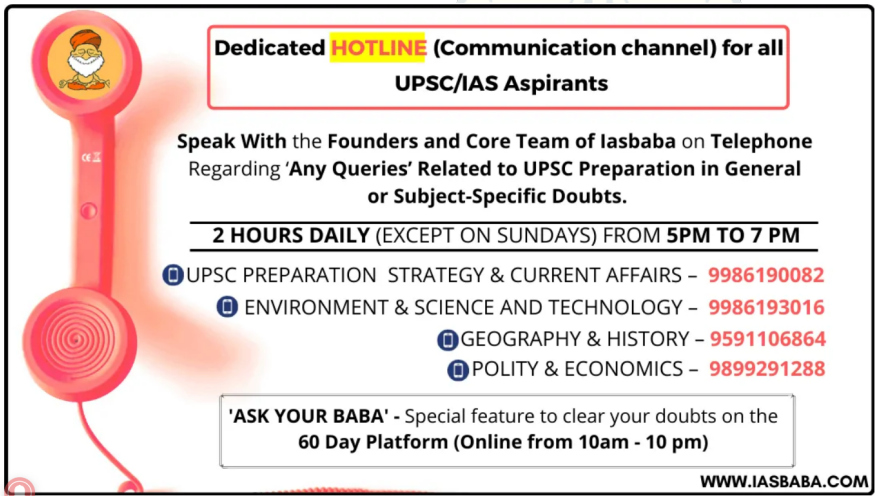
The programme will get fund under EU funding programme for research and innovation called 'Horizon 2020'

Q.39) Which of the following initiative comes under the aegis of Ministry of Health and Family Welfare?

1. SAANS campaign
2. National Health Resource Repository Project
3. UMMID initiative
4. Replace program

Select the correct option

a) 1 and 2 only
b) 1, 2 and 3 only
c) 1, 2 and 4 only
d) All of the above



Q.39) Solution (a)

SAANS campaign – Social Awareness and Action to Neutralise Pneumonia - launched by Ministry for Health and Family Welfare

NATIONAL HEALTH RESOURCE REPOSITORY PROJECT

- India's 1st ever healthcare establishment census to collect data of all public and private healthcare establishments.
- It is launched by the Union Ministry of Health and Family Welfare.
- Indian Space Research Organisation (ISRO) is technology partner for this project mainly for data security.

UMMID INITIATIVE

- UMMID (Unique Methods of Management and treatment of Inherited Disorders) has been launched to tackle inherited genetic diseases of newborn babies.
- **It is launched by the Ministry of Science & Technology**
- Shifting of focus from "sick-care" to "wellness" by promoting the prevention of genetic diseases.
- NIDAN (National Inherited Diseases Administration) Kendras are established under the initiative to provide counselling, prenatal testing and diagnosis, management, and multidisciplinary care in Government Hospitals wherein the influx of patients is more.

WHO'S REPLACE Program

Strategic approach to eliminating industrially-produced transfat from national food supplies by 2023.

Q.40) Consider the following pairs:

Report	Releasing Institution
1. India state-level disease burden initiative report	Niti Aayog
2. Healthy states progressive India report	NITI Aayog + MoH&FW + World Bank
3. Global nutrition report	WHO
4. Performance of health outcome index	MoH&FW

Which of the pair have been incorrectly matched?

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

Q.40) Solution (c)

Report	Releasing Institution
1. India state-level disease burden initiative report	It is a joint initiative of the Indian Council of Medical Research (ICMR), the Public Health Foundation of India (PHFI) and the Institute for Health Metrics and Evaluation (IHME) in collaboration with the Ministry of Health and Family Welfare
2. Healthy states progressive India report	NITI Aayog + MoH&FW + World Bank
3. Global nutrition report	Expert Group of the Global Nutrition

	Report; **WHO is a partner**.
4. Performance of health outcome index	NITI Aayog