

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

T.B.C. : STS-K-TPT
Serial No.:

Test Booklet Series

TEST BOOKLET

Subject : Test 20 – Science and Technology
Answer Key



Time Allowed : Two Hours

Maximum Marks : 200

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GOT IT REPLACED BY A COMPLETE TEST BOOKLET.

2. Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer Sheet. Any omission/discrepancy will render the Answer Sheet liable for rejection.

3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. DO NOT write anything else on the Test Booklet.

4. This Test Booklet contains 100/80 items (questions). Each item is printed in English. Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each item.

5. You have to mark all your responses ONLY on the separate Answer Sheet provided. See directions in the Answer Sheet.

6. All items carry equal marks

7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your Admission Certificate.

8. After you have completed filling in all your responses on the Answer Sheet and the examination has concluded, you should hand over to the Invigilator only the Answer Sheet. You are permitted to take away with you the Test Booklet.

9. Sheets for rough work are appended in the Test Booklet at the end.

10. Penalty for wrong answers:

THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS

(i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one third** if the marks assigned to that question will be deducted as penalty.

(ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to that question.

(iii) If a question is left blank, i.e., no answer is given by the candidate, there will be no penalty for that question.

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1. An organic filter that allows only near infrared light (NIR) to pass through can be used for which applications?

- (a) Night photography
- (b) Night vision glasses
- (c) Security and forensics
- (d) All the above**

2. Match the following:

List I List II

- A. Sodium carbonate 1. Photography
B. Sodium bicarbonate 2. Washing
C. Sodium peroxide 3. Baking
D. Sodium Thiosulphate 4. Source of Oxygen

Select the correct option using the code given below:

	A	B	C	D
(a)	2	3	1	4
(b)	3	2	4	1
(c)	2	3	4	1
(d)	3	2	1	4

3. Consider the following statements regarding Biosparging:

- 1. It is an Ex-situ remediation technology.
- 2. It involves the pressurized injection of air below the water table to decrease the content of groundwater oxygen.
- 3. It increases the rate of biological degradation of wastes by naturally occurring Microorganisms.

Which of the above statements is/are correct?

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

4. Which of the following statements correctly represents the difference between viruses and bacteria?

- 1. Viruses are not capable of surviving on their own while bacteria can.
- 2. Viruses have both types of nucleic acids while bacteria have either DNA or RNA.
- 3. Viruses do not have a cell wall but bacteria have a well-defined cell wall.

Select the correct answer using the code given below:

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

5. With reference to the lithium-ion batteries, consider the following statements:

- 1. It is a type of rechargeable battery that is used for electric vehicles but cannot be used for electronic devices.
- 2. Positively-charged lithium ions pass from an anode to a cathode, releasing a stream of proton along the way that form an electric current.

Which of the above statements is/are incorrect?

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

6. Consider the following statements regarding generations of Biofuels:

- 1. First Generation Biofuels are made directly by using the food crops.
- 2. Second Generation Biofuels are made by non-food crops and feedstock.
- 3. Third generation Biofuels are produced from micro-organisms like algae.

Which of the above statements is/are correct?

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

7. Consider the following statements regarding Industrial genetics:

1. In this, the desired proteins are overexpressed in the organism by cells transformation and produced in mass scale.

2. This technique can be used in medicines production and bioremediation .

Which of the above statements is/are correct?

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

8. In May 2018, Nipah virus outbreak was reported in Kozhikode district of Kerala. Consider the following statements regarding the Nipah Virus:

1. It is a zoonotic virus that was first recognized in 1999 in Malaysia.
2. Pigs act as the natural host of the virus.
3. It cannot spread directly from human to human.

Which of the above statements is/are correct?

(a) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) None of the above

9. With reference to the Stealth Technology, consider the following statements:

1. It is also termed as low-observable technology.
2. It is deployed only on aircraft.

Which of the above statements is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

10. With reference to the different types of vaccines, consider the following statements:

1. Inactivated vaccines provoke more durable immunological response than live attenuated vaccines and thus do not require multiple doses.
2. Live-attenuated vaccines cannot be administered to persons with impaired immune response system.
3. In a recombinant vaccine, only a protein from disease causing organism that generates protective immune response is inserted into gene of another cell.

Which of the above statements is /are correct?

(a) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

11. LED stands for Light Emitting Diode, what does 'O' in OLED and 'Q' in QLED stands for

a) Organic ; Quadrature

b) Octave ; Quadrature

c) Octave ; Quantum dot

d) Organic ; Quantum dot

12. Which of the following is true about NASA's Mars InSightLander

1. InSight is the first mission to study the deep interior of Mars.
2. The Astronauts who travel in InSight will be in Mars for one full Martian year
3. InSight will try to detect marsquakes for the first time

Select the answers from the codes given below

a) 1 only

b) 2 only

c) 1 and 3 only

d) 1, 2 and 3

13. Which of the following statement is true about "Combustible Ice"

1. Combustible Ice must be extracted from Deep Sea Ocean bed
2. It can be lit in its frozen state
3. It is a fossil fuel
4. High risk of adverse Greenhouse emission in the extraction process

Select the answers from the code given below

a) 1 and 2 only

b) 3 and 4 only

c) 1, 2 and 3 only

d) 1, 2, 3 and 4

14. Which of the following GM crops are approved in India for Commercial Cultivation?

1. Bt Cotton
2. Bt Brinjal
3. DMH-11 Mustard
4. Golden Rice

Select the answers from the below codes

a) 2 and 3 only

b) 4 only

c) 1 only

d) 1 and 4 only

15. Match List I and List II and select the correct answer using the code given below

Networks

Definition

A. VPN
visible light

1. Wireless connection through

B. LAN
Microwave

2. Wireless connection through

C. Li-Fi
across a public network

3. Extends a private network

D. Wimax
a short distance

4. Connects network devices over

Code:

	A	B	C	D
a)	2	1	4	3
b)	2	4	1	3
c)	3	4	1	2
d)	3	1	4	2

16. Recently KIBBLE BALANCE was in news, what is the area of its use

- a) To understand Climate Change in line with agreed control limits
- b) It is the Biocapacity within which fresh resource created and waste absorbed
- c) It is used to measure fundamental unit of measurement for mass**
- d) It is the balance between DNA characteristics with modified character

17. Stems cells can be broadly classified as Totipotent, Pluripotent and Multipotent. Which of the following statements are true

- 1. Totipotent and Pluripotent cells can form all the cell types in a body .
- 2. Embryonic cells within the first couple of cell divisions after fertilization are the only cells that are Totipotent
- 3. Multipotent stem cells can also form all the cell types in body

Which of the above statements are true

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

18. In November 2018, the 26th General Conference on Weights and Measures (CGPM) changed the SI unit of measurement for the following 4 units. Match the existing unit with the new unit

SI unit	NEW unit
A. KILO	1. Boltzmann constant (k)
B. KELVIN	2. Avogadro constant (NA)
C. AMPERE	3. Planck constant (h)
D. MOLE	4. Elementary charge (e)

Code:

	A	B	C	D
a)	2	1	4	3
b)	2	4	1	3
c)	3	4	1	2
d)	3	1	4	2

19. Sagittarius A (Sag A) and Messier 87 are some of the terms recently in news. They are associated with

- a) Constellations
- b) Radar application
- c) Parallel Solar system
- d) Black holes**

20. Which of the following statements explain Free Space Optical Communication (FSOC).

- 1. Free Space Optical Communication and Fiber Optic Cable communication are the same
 - 2. The In-principle communication method in Free Space Optical Communication and Fiber Optic Cables is the same
 - 3. Fiber Optic Cable Communication and Broad Band Cable communication is different
- Select the answer from the codes given below

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

21. Match List I and List II and select the correct answer using the code given below

Voice Assistant	Company
A. Alexa	1. Google
B. Assistant	2. Amazon
C. Siri	3. Microsoft
D. Cortana	4. Apple

Code:

	A	B	C	D
a)	2	1	4	3
b)	2	4	1	3
c)	3	4	1	2
d)	3	1	4	2

22. Consider the following statements about difference between Genetically Modified Organisms (GMOs) & Living modified organisms (LMOs) :

- 1. GMOs means organisms which are not capable of growing, i.e. are dead.
- 2. LMOs means organisms which are capable of growing.

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

23. With Reference to the 'Nirbhay missile', which of the following statements is/are correct?

1. Nirbhay is not capable of carrying a nuclear warhead.
2. Nirbhay is long range subsonic cruise missile.
3. Nirbhay is mutually developed by Russia and India.

Select the correct answer using the code given below:

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

24. The DNA molecule used as a vehicle to artificially carry foreign genetic material into another cell is known as:

- a) Carrier
- b) Vector**
- c) Transformer
- d) Driver

25. Consider the following statements with respect to the International Union for the Protection of New Varieties of Plants (UPOV):

1. It is an intergovernmental organization based in Geneva, Switzerland.
2. India is not a member of UPOV.

Which of the statement(s) given above is/are correct?

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

26. Consider the following statements regarding Notifiable Diseases:

1. A Notifiable disease is any disease that is required by law to be reported to government authorities.
2. The onus of notifying any disease and the implementation lies with the state government.
3. Any failure to report a notifiable disease is a criminal offence and the state government can take necessary actions against defaulters.

Which of the statements given above is/are correct?

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

27. "Colistin", recently seen in the news is

- a) Cryptocurrency
- b) Fertiliser
- c) Antibiotic**
- d) Herbicide

28. 'Pretomanid' a term recently seen in the news is related to?

- a) It is a group of clinically similar neurologic manifestations caused by several different viruses, bacteria and fungus.
- b) A reproductive strategy that involves development of a female gamete without fertilisation.
- c) An antibacterial drug used to treat an extremely drug-resistant strain of tuberculosis.**
- d) An antibacterial drug used to treat an extremely drug-resistant strain of Malaria

29. McrBC, recently seen in the news is a/an?

- a) World's fastest supercomputer.
- b) A complex bacterial protein which functions as a molecular scissor.**
- c) New drug developed to cure Diabetes.
- d) A functional RNA molecule that is transcribed from DNA but not translated into proteins.

30. Recently in the news, *Carbon Quantum Dots* is a:

- a) Desalination technique.
- b) Process used in chimneys to filter pollutants in the air.
- c) Diagnostic tool for detection of cancerous cells in the human body.**
- d) Device used in movie creation

31. Consider the following statements:

1. Dragonfly is NASA's mission to fly a drone to Saturn's moon Titan.
2. Titan is the largest natural satellite of Saturn.
3. The surface of Titan contains rivers and lakes of frozen water.

Which of the statements given above is/are correct?

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

32. Which one of the following is the correct statement with respect to "Organoids"?

a) Chemical messengers that are secreted directly into the blood, which carries them to organs and tissues of the body to exert their functions.

b) A group of cells grown in laboratories that mimic the cell arrangement of a fully-grown organ.

c) The process of producing genetically identical individuals of an organism either naturally or artificially.

d) Protein molecules in cells which work as biological catalysts.

33. "Pegasus", recently in the news is a/an:

a) Spyware

b) AI-enabled robot

c) New species of Penguin

d) Quantum Computer

34. With reference to Anthrax disease, consider the following statements:

1. It is caused by Bacillus Anthracis bacteria commonly found in the soil.

2. Bacillus Anthracis bacteria is a gram-positive bacteria.

3. Human beings cannot get infected by this bacteria.

Which of the statements given above is/are correct?

a) 1 and 2 only

b) 3 only

c) 2 and 3 only

d) 1, 2 and 3

35. Consider the following statement regarding "Nanopharmaceuticals":

1. It represents an emerging field where the sizes of the drug particles work at the microscale.

2. It offers site-specific targeting of active agents.

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

36. Consider the following statements:

1. Polio is an acute infectious disease caused by a virus.

2. There is no cure for Polio as it can only be prevented. 3. The World Health Organisation has not yet declared India Polio free.

Which of the statements given above is/are correct?

a) 1 and 2 only

b) 2 and 3 only

c) 1, 2 and 3

d) 1 and 3 only

37. "3D printing" has applications in which of the following?

1. Preparation of confectionery items

2. Manufacture of bionic ears

3. Automotive industry

4. Reconstructive surgeries

5. Data processing technologies

Select the correct answer using the code given below :

(a) 1, 3 and 4 only

(b) 2, 3 and 5 only

(c) 1 and 4 only

(d) 1, 2, 3, 4 and 5

38. Consider the following statements regarding Firewall:

1. It is used to block malicious traffic requests and data packets while allowing legitimate traffic through.

2. Packet filtering firewalls opens up the coming packet to inspect all of its inside contents for passing.

3. Circuit-level gateways work by verifying the transmission control protocol (TCP) handshake.

Which of the above statements are correct?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

39. Nuclear force is a force that binds a nucleus together. In this context, consider the following statements:

1. Nuclear forces are stronger than the force of gravity.
2. The strength of nuclear force depends upon the electric charge.

Which of the above statements is/are correct?

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

40. Consider the following statements:

1. The theory of special relativity shows that mass can be converted into energy.
2. As per the law of radioactive decay, the probability per unit time that a nucleus will decay is constant.

Which of the above statements is/are correct?

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

41. With reference to the type of product and its related IP protection type, consider the following pairs:

1. Star Wars Movie – Trademark
2. Macdonald's Brand Name – Copyright
3. Maglev – Patent
4. Kancheepuram Silk – GI Tag

Which of the above given pairs is/are incorrectly matched?

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

42. Consider the following statements regarding Nuclear Fuel Cycle:

1. It is the progression of nuclear fuel from reactor to its disposal.
2. The approach to waste disposal is to make the nuclides immobilized and then placed them underground.

Which of the above statements is/are correct?

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

43. Match the following pairs with reference to Robots and their applications:

Column 1

Column 2

- | | |
|--------------|--|
| A. Ai-Da | 1. India's first indigenous industrial robot |
| B. Groundhog | 2. Anthromorphic humanoid robot |
| C. ATLAS | 3. Mine-mapping robot |
| D. BRABO | 4. First robot artist to stage an exhibition |

Identify the correct order:

- | | A | B | C | D |
|-----|----------|----------|----------|----------|
| (a) | 1 | 2 | 3 | 4 |
| (b) | 2 | 4 | 1 | 3 |
| (c) | 4 | 3 | 2 | 1 |
| (d) | 3 | 4 | 1 | 2 |

44. Consider the following statements regarding Virtual Private Network (VPN):

1. It allows a user to access to internal internet by connecting to network through tunneling.
2. It helps in remotely accessing the information.
3. India has emerged as rank 3 worldwide in terms of mobile VPN app downloads.

Which of the above statements are correct?

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

45. With reference to Thorium Reactors, consider the following statements:

1. Unlike uranium, thorium alone cannot be used as a nuclear fuel in a reactor.
2. Thorium reactors offer the advantage of increased plutonium production.

Which of the above statements is/are correct?

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

46. Consider the following statements regarding Networking:

1. Bluetooth is a radio frequency (RF) technology that operates at 5GHz.
2. Bluetooth connects short-range devices and Wifi connects devices in larger range for sharing data.
3. K-fi is the project launched in which free WiFi zones have been set up in select areas of Karnataka.

Which of the above statements is/are correct?

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

47. With reference to types of robots, consider the following statements:

1. Autonomous Robots are self-supporting in their actions.
2. Walking Robots are a type of Mobile Robots.
3. Mars Explorer is a type of Mobile Robot.

Which of the above statements are correct?

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

48. Consider the following statements with reference to properties of nanomaterial:

1. They are governed by rules of Quantum mechanics.
2. The chemical reactivity of the substances increases drastically on Nano transformation.
3. Reduced melting point and boiling point is the reason behind its increased strength.

Which of the above given statements is/are correct?

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

49. With reference to Nanofabrics, consider the following statements:

1. These are textiles embedded with small nano particles.
2. Zinc oxide embedded nanofabrics can be used for UV rays protection.

Which of the above statements is/are correct?

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

50. Consider the following statements with reference to Graphene:

1. It is the thinnest compound known to man.
2. Graphite can be formed by stacking layers of graphene on top of each other.
3. It is highly impermeable and photosensitive in its characteristics.

Which of the above statement is/are incorrect?

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

51. Nanoparticle that is made from fat molecules surrounding a core of water is known as:

- (a) Liposome**
(b) Vesicles
(c) Proteomics
(d) None of the above

52. What is Kordylewski dust clouds

a) Dust storms from Arabian peninsula entering India

b) Dust clouds in space that revolves around the earth

c) Dust cloud formed due to pollutants expelled by human action that reflects the sun rays back

d) A group of satellite debris that have accumulated in the space

53. What is Combustible Ice?

- a) It is a substance that can be used in cryogenic engines to prevent freezing
b) It is substance that produce artificial freezing atmosphere used for making motion pictures
c) It is a chemical substance recently used as an alternative for CFC refrigerants

d) It is a frozen fossil fuel that may be the future of world energy requirement

54. Combustible Ice is a mixture of

- a) **Methane Hydrate**
- b) Sodium Hydrate
- c) Nitrogen Hydrate
- d) Carbohydrate

55. Icecube observatory is constructed at the pole station in Antarctica for the purpose of

- a) Analysing the reducing density of polar ice caps
- b) Breaking ICE that will be a fresh water source for gulf countries
- c) To observe the life sustainence in the worlds largest marine reservce near Antartica
- d) **To observe the charge less abundant particle in the universe**

56. Part of the World Wide Web that is only accessible by means of special software, allowing users and website operators to remain anonymous or untraceable is called

- a) Deep Web
- b) **Dark Web**
- c) Surface Web
- d) Mystery Web

57. Transiting Exoplanet Survey Satellite (TESS) is part of NASA's Explorers program, designed to search for exoplanets using the transit method. TESS is a

- a) **Space Telescope**
- b) Weather analysis station for other planets
- c) Telecommunication Satellite to act as a communicator for several exo-satellite
- d) Space asteroid path mapper

58. PROJECT BRAINWAVE a deep learning platform of Microsoft aims to

- a) Read human brainwaves to identify the human thoughts
- b) **Bring in real time artificial intelligence that will enhance faster system process**
- c) Simulate environment where self-driving cars can test in high pressure zones
- d) Establish non addictive gaming for children who are addicted to gaming disorder

59. Consider the following statement

- 1. In a visible spectrum of light, Red Light is more energetic than green light
- 2. The wavelength of red light is more than that of green light

Select the correct statement

- a) 1 only correct
- b) **2 only correct**
- c) Both 1 and 2 is correct
- d) Neither 1 nor 2 is correct

60. DELAMANID drug recently in news is meant to cure which of the following diseases

- a) **Tuberculosis**
- b) Elephantiasis
- c) Malaria
- d) Chikungunya

61. Which of the following statements about Stem Cells are true?

- 1. They are biological cells that can differentiate into other types of stem cells
 - 2. They are called progenitor cells that act as a repair system for the body
 - 3. Stem cells can now be artificially grown and transformed (differentiated) into specialized cell
- Which of the above statements are true

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

62. Recently "Cryo-electron microscopy" was in news with reference to

- a) Detecting cosmic gravitational waves
- b) DNA sequencing in Space
- c) **Examining intricate structure of Biomolecules**
- d) Embryo transfer Technology

63. Recently World Health Organisation came up with a program called "REPLACE" aiming to elimination of industrially-produced trans fat in food supply. Which of the following statements are true

- 1. Increased intake of trans fat (>1% of total energy intake) is associated with increased risk of coronary heart disease
- 2. REPLACE program bans all Trans fat food production from 2023

Select the correct statement

- a) **1 only correct**
- b) 2 only correct
- c) Both 1 and 2 is correct
- d) Neither 1 nor 2 is correct

64. Volume, Variety and Velocity are all characteristics of

- a) Artificial Intelligence
- b) Robotics
- c) Big Data**
- d) Machine Learning

65. MeerKAT telescope, sometimes seen in the news, is

a) the first major optical telescope to be placed in space.

b) the successor of Hubble Space telescope.

c) the biggest radio telescope in the Southern Hemisphere.

d) a pair of telescopes covering the entire sky.

66. Superconductors do not allow magnetic fields to pass through them. They expel the magnetic field – this phenomenon is known as Meissner effect. Meissner effect is used for Magnetic levitation. Which of the following area uses Meissner effect and Magnetic levitation?

- a) Particle Accelerator
- b) Hyperloop Train**
- c) Satellite launch vehicle
- d) Genetic Engineering

67. Which of the following statements is not true about Black Swan Event?

a) Black swan events are random and unexpected phenomenon that carries a big or disproportional impact.

b) Unsupervised machine-learning algorithms is the area of study to understand whether a Black swan event can be forecasted

c) Black Swan occurrences require automated proactive insight which may be possible through Artificial Intelligence

d) Black swan events can be predicted by data mining and analysing Big data

68. What is Global Relay of Observatories Watching Transients Happen (GROWTH).

1. It is a network of observatories that will monitor and forecast Tsunami, Seismic waves and other Transient events

2. India is a part of GROWTH observatory in Hanle, Ladakh dedicated for the purpose

Select the answers from the codes given below

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

69. What may be the possible advantages of Cryo-electron microscopy

1. It helps in better understanding on how biomolecules function and interact

2. Scientist can quickly reconstruct the virus structure to develop new drugs

3. Provides better understanding on how high energy protons from solar (sun) flares affect earth

Select the answers from the codes below

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

70. Transiting Exoplanet Survey Satellite (TESS) is planned to be launched at

- a) Geocentric Orbit
- b) Lunar Orbit

c) Goldilock Orbit

d) Areaocentric Orbit

71. The Food Safety and Standards Authority of India (FSSAI) had launched RUCO (Repurpose Used Cooking Oil) what is the purpose of RUCO

a) Refine cooking oil to make it viable to use for further cooking

b) Condense the used oil into flammable camphor pellets

c) Dispose used cooking oil without any environmental hazard

d) Conversion of used cooking oil to biodiesel

72. Consider the following statements with reference to Arteries and Veins?

1. Arteries carry blood away from the heart and Veins bring it back to the heart

2. Veins have thicker walls than arteries

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

73. Global Positioning System (GPS) is the oldest Navigation system developed by United States. Match the following Navigation System with the respective countries

Navi. System	Country
A. Galileo	1. China
B. Glonass	2. India
C. Beidou	3. European Union
D. Navic	4. Russia

Code:

	A	B	C	D
a)	2	1	4	3
b)	2	4	1	3
c)	3	4	1	2
d)	3	1	4	2

74. "Floating points Operation Per Second" is a measuring unit for

- a) Satellite Position
- b) Hyperloop train speed
- c) Super Computing**
- d) Parachute opening speed

75. Which of the following is not an example of Artificial Intelligence

- a) Google Maps (Maps) can analyze the speed of movement of traffic at any given time
- b) Price determined for ride and Minimizing wait time by cab aggregating companies like uber, ola etc.,
- c) Spam filters used in email box to filter the spam mails with real targeted mails
- d) An automatic printing machine which can print based on the format of its pre-program**

76. The Laser Interferometer Gravitational-Wave Observatory (LIGO) is called as an Observatory, but it is not actually an observatory. So says the Scientists who constructed LIGO. Which of the following statements are true

- 1. LIGO observatory is not a dome shaped one unlike other observatories
- 2. LIGO is blind that it has no eyes (no cameras) it cannot see electromagnetic lights
- 3. LIGO cannot function alone, it need a twin facility to detect waves through its Dual detectors

Select the answer from the codes below

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

77. Which of the following Viral Fevers spread through Aedes mosquitoes and not through any other mosquito or other vectors

- 1. Zika Virus
- 2. Dengue Virus
- 3. Malaria
- 4. Chickungunya
- 5. Yellow Fever

Select the answer from the below codes

- a) 1, 2, 3 and 5 only
- b) 2, 3, 4 ,and 5 only
- c) 1, 2, 4 and 5 only**
- d) All of the above

78. The practice of using a network of remote servers hosted on the Internet to store, manage, and process data is called as

- a) Edge Computing
- b) Cloud Computing**
- c) Mobile Computing
- d) Personal Computing

79. Which of the following correctly describes 'Smart dust' ?

- a) Class of chemicals that give cognitive benefits to the human brain.
- b) Man-made material that is orbiting Earth but no longer functional.
- c) Hypothetical collection of tiny robots that can replicate a physical structure.
- d) Hypothetical network of tiny computing circuits and robots for wireless communications.**

80. Which of the following statements are true about Ionospheric Connection Explorer and Ionosphere

- 1. ICON Explorer will study the frontier of space both Ionosphere
- 2. Ionosphere is the area through which radio communications and GPS signals travel
- 3. ICON will assess complicated system of both terrestrial and space weather that affects Ionosphere

Which of the above statements are true

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

81. Match List I and List II and select the correct answer using the code given below

Industrial Revolution	Process
A. 1st Ind. Rev.	1. Electronics, Digital and Mass Customization
B. 2nd Ind. Rev.	2. Mechanization & Steam Power
C. 3rd Ind. Rev.	3. Smart Factory & Cyber Physical systems
D. 4th Ind. Re	4. Electricity, Assembly line and Mass production

Code:

	A	B	C	D
a)	2	1	4	3
b)	2	4	1	3
c)	3	4	1	2
d)	3	1	4	2

82. Which of the following statement is incorrect with reference to Golden Rice?

- a) Golden Rice gene is created with a combination of Daffodil, Bacteria and Maize
- b) Golden Rice is a bio-fortified rice that is rich in Vitamin A, Zinc and Iron
- c) Golden Rice is rich in Beta-Carotene that converts into Vitamin A

d) Boka Chaul that received GI tag in Assam is the first Golden Rice farm in India

83. Which one of the following types of waves are used in a night vision apparatus

- a) Radio waves
- b) Micro waves
- c) Infrared waves**
- d) Sound waves

84. The Cassini–Huygens mission was joint project of NASA, European Space Agency (ESA) and Italian Space Agency (ASI). It was commissioned to explore

- a) Jupiter
- b) Saturn**
- c) Mars
- d) Uranus

85. Prosthetics is removing Physical Barriers faced by disabled people. Prosthetics is possible by applying of biological principles to the study and design of engineering systems. This is called as

- a) Biomimetics
- b) Bionics**
- c) Biosystematics
- d) Biomechanics

86. Which of the following statement is not correct about Ready-to-use Therapeutic Food (RUTF)

- a) RUTF is a ready-to-use paste which does not need to be mixed with water
- b) One of the disadvantages of RUTF is it cant be stored for a longer period**
- c) RUTF are energy- dense, micronutrient enhanced pastes used in therapeutic feeding
- d) RUTF can be used as a therapy for children suffering from uncomplicated severe acute malnutrition

87. Which of the following statement about Satellite Launch Station is true

- 1. Satellite launch stations are planned to be set up near the equator
 - 2. Launch stations are normally located on the eastern side of the landmass
 - 3. ISRO plans to set up a Rocket launch station at Kulasekarapattinam in Kerala
- Select the answer from the below codes

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

88. Which of the following statement about Goldilock Orbit is true

- a) Goldilock orbit and Goldilock zone is the same
- b) Goldilock orbit is not too close to Earth and Moon, and it's not too far either**
- c) From Goldilock orbit the view to deep space is minimal
- d) Goldilock orbit is circular and remains within the earth's radiation belt

89. Long distance communication between two points on the earth is possible because of

Reflection of electromagnetic waves by

- a) Thermosphere
- b) Stratosphere
- c) Ionosphere**
- d) Mesosphere

90. Consider the following statements regarding bioremediation techniques:

1. Bio-venting involves the release of substantial quantities of microorganisms to carry out a specific remediation task in a given contaminated environment.
2. Bioaugmentation involves supplying of air and nutrients through wells to contaminated soil to stimulate the growth of microorganisms.

Which of the above statements is/are correct?

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

91. Consider the following statements:

1. A White Dwarf is a star near the end of its life that has used most or all of its nuclear fuel and collapsed into a size similar to Earth.
2. A Supernova is the explosion of a star that happens where there is a change in the core of a star.
3. White Dwarfs can never explode completely to become a Supernova.

Which of the statements given above is/are correct?

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

92. Consider the following statements regarding the Sheath Blight disease:

1. It is a bacterial disease affecting the yield of rice crop.
2. Plants are more vulnerable to sheath blight during the summer season.

Which of the above statements is/are incorrect?

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

93. Vikram and Pragyan, seen in the news recently are:

(a) Long Range Inter-Continental Ballistic Missiles (ICBMs) developed by DRDO.

(b) Lander and Rover of ISRO's Chandrayaan-2 mission.

(c) Indigenously built Light Combat Aircrafts by HAL.

(d) Altitude long-endurance Unmanned Aerial Vehicles (UAVs) by DRDO.

94. "Event Horizon" and SCHWARZSCHILD RADIUS is related to:

- (a) Telescope
- (b) Black hole**
- (c) Solar glares
- (d) None of the above

95. Osteomalacia is caused by the deficiency of:

- (a) Vitamin D**
- (b) Vitamin K
- (c) Vitamin A
- (d) Vitamin C

96. Consider the following about propagation of sound:

1. Two person can talk in vacuum like we talk on earth.
2. The velocity of sound is constant

Which of the above statements is/are correct?

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

97. Consider the following pairs:

1. Red Blood Cells – Erythrocytes
2. White Blood Cells – Leukocytes
3. Platelets – Macrophages

Which of the above pairs is/are correctly matched?

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

98. Consider the following statements regarding cell:

1. The cells having nuclear material without a nuclear membrane are termed prokaryotic cells.
2. Animal cells have cell walls.
3. The cells having a well-organized nucleus with a nuclear membrane are designated as eukaryotic cells.

Which of the above statements is/are correct?

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

99. Concave mirrors are commonly used in which of the following?

1. Torches
2. Shaving mirrors
3. Rear-view (wing) mirrors in vehicles
4. Concentrating sunlight to produce heat in solar furnaces

Select the correct answer using the code given below:

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

100. Which of the following are pollinating agents?

1. Wind
2. Bat
3. Humans
4. Moths

Select the correct answer using the code given below:

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