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NATIONAL ACADEMY OF STEM, CYBERNETICS & AI

NASCA STEAM Education Programme
Question Bank for STEAM Quest
Senior Division, Grade 9-12

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Multiple Choice Questions (MCQ) with Answer Key 200+ Questions across 4 Categories

Categories Covered:

1. Scientific Inquiry & Innovation
2. Arts & Design in STEAM
3. Technology & the Digital World
4. Current Affairs & Contemporary STEAM

Note: Correct answers are shown in bold.

CATEGORY 1: Scientific Inquiry & Innovation

Q1. Which of the following best describes a 'controlled experiment'?

(A) An experiment done without any hypothesis

(B) An experiment where all variables are changed simultaneously

(C) An experiment where only one variable is changed while others are kept constant

(D) An experiment repeated only once for accuracy

Q2. The SI unit of luminous intensity is:

(A) Lumen

(B) Candela

(C) Lux

(D) Watt

Q3. Which instrument measures atmospheric pressure?

(A) Hygrometer

(B) Anemometer

(C) Barometer

(D) Thermometer

Q4. In the scientific method, a hypothesis must be:

(A) Proven true before experimentation

(B) Testable and falsifiable

(C) Based on mathematical equations only

(D) Approved by a committee

Q5. What is the purpose of a 'control group' in an experiment?

(A) To provide a baseline for comparison

(B) To ensure all variables change together

(C) To eliminate the need for repetition

(D) To replace the experimental group

Q6. Which of these is an example of qualitative data?

(A) The temperature is 37°C

(B) The solution turned blue

(C) The mass is 5.2 kg

(D) The voltage measured 12V

Q7. What does 'replication' mean in scientific research?

(A) Creating identical organisms

(B) Repeating an experiment to verify results

(C) Copying data from other studies

(D) Publishing results in journals

Q8. A scientist measures the same object five times and gets five different values. This indicates a problem with:

(A) Accuracy

(B) Validity

(C) Precision

(D) Reliability

Q9. Which of the following is NOT a step in the scientific method?

(A) Observation

(B) Hypothesis formation

(C) Peer opinion collection

(D) Data analysis

Q10. In an experiment, the variable that the scientist deliberately changes is called:

(A) Dependent variable

(B) Independent variable

(C) Controlled variable

(D) Random variable

Q11. A student observes that plants near a window grow taller. A good hypothesis would be:

(A) Plants are alive

(B) More light causes greater plant growth

(C) Windows are made of glass

(D) Soil is necessary for plants

Q12. Which statement is a valid scientific hypothesis?

(A) The moon is beautiful tonight

(B) Music makes people happy

(C) Higher caffeine intake increases heart rate in adults

(D) All scientists are smart

Q13. What distinguishes a theory from a hypothesis in science?

(A) A theory is less tested than a hypothesis

(B) A theory is a well-substantiated explanation supported by extensive evidence

(C) A hypothesis is based on experiments; a theory is based on opinions

(D) They are the same thing

Q14. A student asks: 'Does the color of light affect plant growth?' This is an example of:

(A) A conclusion

(B) A research question

(C) A data table

(D) A peer review

Q15. Which of the following hypotheses is written in the correct 'If...then...' format?

(A) Plants grow better in sunlight

(B) If plants receive more sunlight, then they will grow taller

(C) Sunlight is good for plants

(D) More sunlight equals more growth

Q16. C.V. Raman won the Nobel Prize in Physics (1930) for discovering:

(A) The structure of DNA

(B) The Raman Effect (scattering of light)

(C) Nuclear fission

(D) The electron

Q17. Which Japanese scientist co-developed the blue LED, winning the Nobel Prize in Physics 2014?

(A) Akira Kurosawa

(B) Shuji Nakamura

(C) Kenichi Fukui

(D) Makoto Kobayashi

Q18. Tu Youyou, the first Chinese woman to win a Nobel Prize in Physiology/Medicine (2015), discovered:

(A) Insulin

(B) Artemisinin (anti-malarial drug)

(C) Penicillin

(D) Aspirin

Q19. Subrahmanyan Chandrasekhar is known for his work on:

(A) Quantum mechanics

(B) The theoretical limit of stellar mass (Chandrasekhar limit)

(C) Radio waves

(D) Plate tectonics

Q20. Har Gobind Khorana shared the Nobel Prize in Physiology/Medicine (1968) for his work on:

(A) Photosynthesis

(B) The genetic code and protein synthesis

(C) Vaccination

(D) Blood groups

Q21. Which Indian scientist is known as the 'Father of the Indian Nuclear Programme'?

(A) A.P.J. Abdul Kalam

(B) Homi J. Bhabha

(C) Vikram Sarabhai

(D) S. Chandrasekharan

Q22. Satyendra Nath Bose collaborated with Albert Einstein to describe:

(A) Relativity

(B) A class of particles now called 'bosons'

(C) Black holes

(D) DNA replication

Q23. Which Asian country launched the first successful Mars orbiter mission by a non-superpower nation?

(A) China

(B) Japan

(C) India

(D) South Korea

Q24. Akira Suzuki won the 2010 Nobel Prize in Chemistry for developing:

(A) A new method of nuclear fusion

(B) Palladium-catalyzed cross-coupling reactions

(C) Polymer synthesis

(D) Semiconductor technology

Q25. Yoshinori Ohsumi won the 2016 Nobel Prize in Physiology/Medicine for his discoveries in:

(A) Cancer immunotherapy

(B) Autophagy (cellular self-cleaning process)

(C) Gene editing

(D) Stem cell research

Q26. Malala Yousafzai is associated with advocating for:

(A) Climate change awareness

(B) Girls' education and STEAM access

(C) Animal rights

(D) Nuclear disarmament

Q27. The 'Leaky Pipeline' problem in STEM refers to:

(A) Water wastage in labs

(B) The progressive loss of women from STEM careers at each stage

(C) Pipeline infrastructure issues

(D) Lack of funding for STEM

Q28. Which initiative aims to increase girls' participation in STEM globally?

(A) OPEC

(B) UNESCO's Girls in ICT Day

(C) WHO's STEM Drive

(D) ASEAN Tech Week

Q29. Gitanjali Rao, named TIME Magazine's first-ever Kid of the Year (2020), is known for:

(A) Writing bestselling novels

(B) Developing a device to detect lead in water

(C) Creating a new programming language

(D) Winning an Olympic medal

Q30. According to UNESCO, women represent approximately what percentage of STEM researchers worldwide?

(A) 50%

(B) 29%

(C) 10%

(D) 40%

Q31. The 'Hidden Figures' story highlights the contributions of:

(A) Male astronomers at NASA

(B) Black women mathematicians who were crucial to NASA missions

(C) Hidden scientific documents

(D) Asian engineers in Silicon Valley

Q32. What does STEAM add to STEM that STEM alone does not include?

(A) Sports

(B) Arts

(C) Agriculture

(D) Astronomy

Q33. Why is diversity important in STEAM fields?

(A) It is a legal requirement only

(B) Diverse teams produce more creative and comprehensive solutions

(C) It reduces costs of research

(D) It has no proven impact

Q34. Which young climate activist from Asia became globally known for her environmental advocacy?

(A) Vanessa Nakate (Uganda)

(B) Licypriya Kangujam (India)

(C) Emma Watson (UK)

(D) Greta Thunberg (Sweden)

Q35. Kalpana Chawla was significant in STEAM history because she was:

(A) The first woman to walk on the moon

(B) The first woman of Indian origin to go to space

(C) The founder of NASA's women's division

(D) The first Asian Nobel laureate

Q36. Which organization hosts the International Mathematical Olympiad (IMO)?

(A) UNESCO

(B) International Mathematical Union (IMU)

(C) World Science Forum

(D) UNICEF

Q37. The 'double helix' structure of DNA was first proposed by:

(A) Marie Curie and Albert Einstein

(B) James Watson and Francis Crick (with crucial X-ray data from Rosalind Franklin)

(C) Charles Darwin and Gregor Mendel

(D) Linus Pauling alone

Q38. Which type of reasoning involves moving from specific observations to general conclusions?

(A) Deductive reasoning

(B) Inductive reasoning

(C) Abductive reasoning

(D) Circular reasoning

Q39. Peer review in science primarily serves to:

(A) Delay publication of research

(B) Ensure quality and validity by having experts evaluate work before publication

(C) Increase research costs

(D) Give credit only to senior scientists

Q40. Which unit is used to measure the intensity of earthquakes?

(A) Joules

(B) Moment magnitude (logarithmic scale, formerly Richter)

(C) Pascals

(D) Decibels

Q41. Dr. APJ Abdul Kalam is known as the 'Missile Man of India' for his contributions to:

(A) Agricultural science

(B) India's missile and space programs (AGNI, PSLV)

(C) Medical research

(D) Environmental science

Q42. What is 'citizen science' in the context of scientific inquiry?

(A) Science funded by citizens

(B) Public participation in scientific research by collecting data or solving problems

(C) Science policy made by voters

(D) School-based science only

Q43. The metric prefix 'nano' means:

(A) One millionth (10^-6)

(B) One billionth (10^-9)

(C) One trillionth (10^-12)

(D) One thousandth (10^-3)

Q44. Which force keeps planets in orbit around the sun?

(A) Electromagnetic force

(B) Gravitational force

(C) Nuclear strong force

(D) Centrifugal force

Q45. What is the process by which plants make food using sunlight called?

(A) Respiration

(B) Photosynthesis

(C) Transpiration

(D) Fermentation

Q46. The pH scale measures:

(A) Temperature

(B) The acidity or alkalinity of a solution (0-14)

(C) Electrical charge

(D) Density

Q47. Newton's Second Law of Motion states that Force equals:

(A) Mass divided by Acceleration

(B) Mass multiplied by Acceleration (F=ma)

(C) Velocity multiplied by Time

(D) Distance divided by Time squared

Q48. Which layer of the Earth is composed primarily of liquid iron and nickel?

(A) Inner core

(B) Outer core

(C) Mantle

(D) Crust

Q49. Mitosis results in daughter cells that are:

(A) Haploid (half the chromosomes)

(B) Diploid (same number of chromosomes as parent)

(C) Triploid

(D) Always genetically different from the parent

Q50. The speed of light in a vacuum is approximately:

(A) 300 km/s

(B) 300,000 km/s (3x10^8 m/s)

(C) 3,000 km/s

(D) 30,000 km/s

Q51. Which type of radiation has the highest penetrating power?

(A) Alpha radiation

(B) Beta radiation

(C) Gamma radiation

(D) Ultraviolet radiation

Q52. Avogadro's number (6.022 x 10^23) represents:

(A) The number of atoms in 1 gram of any element

(B) The number of particles in one mole of a substance

(C) The number of molecules in 1 liter of gas

(D) The number of electrons in one atom

Q53. What does 'bioluminescence' mean?

(A) Light produced by chemical reactions in living organisms

(B) The absorption of sunlight by plants

(C) Electricity generated by biological cells

(D) The reflection of moonlight on water

Q54. The process of converting analog signals to digital signals is called:

(A) Modulation

(B) Digitization/Analog-to-Digital Conversion

(C) Amplification

(D) Encryption

Q55. Which gas makes up approximately 78% of Earth's atmosphere?

(A) Oxygen

(B) Carbon dioxide

(C) Nitrogen

(D) Argon

Q56. The Law of Conservation of Mass states that:

(A) Mass can be created from energy

(B) Matter is neither created nor destroyed in a chemical reaction

(C) Mass increases during combustion

(D) Mass and energy are always separate

Q57. What is the function of the mitochondria in a cell?

(A) Protein synthesis

(B) Producing energy (ATP) through cellular respiration

(C) DNA replication

(D) Cell division

Q58. Which scientist proposed the heliocentric model of the solar system?

(A) Galileo Galilei

(B) Nicolaus Copernicus

(C) Johannes Kepler

(D) Isaac Newton

Q59. Osmosis is defined as the movement of:

(A) Solute molecules through a semipermeable membrane

(B) Water molecules from high to low concentration through a semipermeable membrane

(C) All particles from low to high concentration

(D) Gases through a solid barrier

Q60. The unit 'Pascal' (Pa) measures:

(A) Temperature

(B) Pressure

(C) Electric current

(D) Luminosity

Q61. Which branch of biology studies heredity and genetic variation?

(A) Ecology

(B) Genetics

(C) Microbiology

(D) Anatomy

Q62. Which Asian country was the first to develop a COVID-19 vaccine approved for public use?

(A) India

(B) Japan

(C) China

(D) South Korea

CATEGORY 2: Arts & Design in STEAM

Q63. The term 'chiaroscuro' in visual arts refers to:

(A) The use of multiple colors

(B) The contrast between light and shadow

(C) Geometric patterns in art

(D) Digital art techniques

Q64. Which principle of physics is most directly applied in ballet to achieve long spins (pirouettes)?

(A) Bernoulli's principle

(B) Conservation of angular momentum

(C) Newton's third law

(D) Archimedes' principle

Q65. The science behind the acoustics of concert halls primarily deals with:

(A) Electromagnetic waves

(B) Reflection, absorption, and diffraction of sound waves

(C) Gravitational pull on sound

(D) Chemical properties of materials

Q66. Pointillism, developed by Georges Seurat, is based on the principle that:

(A) Random dots create chaos

(B) Small dots of pure color, viewed from a distance, mix optically

(C) Only primary colors should be used

(D) Painting should mimic photography

Q67. Which branch of science explains why musical instruments produce different tones?

(A) Optics

(B) Acoustics and wave physics

(C) Thermodynamics

(D) Electromagnetism

Q68. The phenomenon used in 3D movies where two slightly different images create depth is based on:

(A) Polarization of light

(B) Binocular vision and stereoscopy

(C) Chromatic aberration

(D) Diffraction of light

Q69. Which technology underlies digital animation such as CGI movies?

(A) Chemical photography

(B) Computer graphics and mathematics (linear algebra, calculus)

(C) Biological imaging

(D) Acoustic modelling

Q70. The Doppler effect in music is perceived when:

(A) A musical note gets louder

(B) A sound source moves toward or away from the listener, changing pitch

(C) Instruments are tuned incorrectly

(D) Sound waves are absorbed by walls

Q71. The Fibonacci sequence appears in nature in:

(A) The boiling point of water

(B) The spiral arrangement of sunflower seeds

(C) The atomic weight of elements

(D) The speed of sound

Q72. The Golden Ratio (approximately 1.618) is denoted by which Greek letter?

(A) Alpha

(B) Phi

(C) Pi

(D) Sigma

Q73. Fractals are geometric shapes characterized by:

(A) Perfect symmetry on one axis

(B) Self-similarity at different scales

(C) Only straight lines

(D) Absence of any pattern

Q74. Which architectural structure is a famous example of the Golden Ratio in design?

(A) Burj Khalifa

(B) The Parthenon in Athens

(C) The Eiffel Tower

(D) The Sydney Opera House

Q75. Tessellations are patterns made of shapes that:

(A) Overlap each other

(B) Tile a plane without gaps or overlaps

(C) Are always hexagonal

(D) Must be curved

Q76. The hexagonal shape of honeycomb cells is mathematically optimal because:

(A) Bees cannot make circles

(B) It uses the least wax material to create the most storage space

(C) Hexagons are easiest to draw

(D) It is the only shape that fits together

Q77. Symmetry in design: which type does a starfish display?

(A) Bilateral

(B) Radial (pentaradial)

(C) Rotational (180 degrees)

(D) Asymmetry

Q78. The Taj Mahal's design is primarily an example of which architectural style?

(A) Gothic

(B) Mughal (Indo-Islamic)

(C) Baroque

(D) Byzantine

Q79. Angkor Wat in Cambodia is architecturally significant because it:

(A) Is entirely made of wood

(B) Is the largest religious monument in the world and aligns with astronomical events

(C) Was built in the 20th century

(D) Has no mathematical design principles

Q80. Traditional Japanese architecture uses 'shoji' screens, which are made of:

(A) Thick stone walls

(B) Translucent paper on a wooden lattice frame

(C) Metal grilles

(D) Stained glass

Q81. The ancient city of Mohenjo-daro (Indus Valley Civilization) is notable for its:

(A) Pyramids

(B) Advanced urban planning and drainage systems

(C) Colosseum-like arenas

(D) Underground temples

Q82. Which Islamic architectural feature is a projecting upper floor supported by brackets?

(A) Minaret

(B) Mashrabiyya

(C) Muqarnas

(D) Iwan

Q83. Leonardo da Vinci's 'Vitruvian Man' demonstrates:

(A) Artistic creativity with no scientific basis

(B) The mathematical proportions of the ideal human body

(C) Religious symbolism only

(D) A portrait of a real historical figure

Q84. Scientific illustration differs from artistic illustration primarily in that it:

(A) Uses only black and white

(B) Prioritizes accurate representation of scientific subjects over aesthetic style

(C) Is always digital

(D) Requires no scientific knowledge

Q85. M.C. Escher's artwork is famous for exploring concepts from:

(A) Music theory

(B) Mathematics (tessellations, impossible objects, infinity)

(C) Chemistry

(D) Biology exclusively

Q86. Which art movement used scientific understanding of color and light, developed in the late 19th century?

(A) Cubism

(B) Impressionism

(C) Surrealism

(D) Dadaism

Q87. Data visualization is a field at the intersection of:

(A) Biology and chemistry

(B) Art/design and data science

(C) Music and mathematics

(D) Literature and physics

Q88. The concept of 'biomimicry' in design means:

(A) Designing for biological labs only

(B) Imitating natural systems and organisms to solve design problems

(C) Creating artificial life forms

(D) Using only organic materials in art

Q89. Which famous building was inspired by the lotus flower, reflecting biomimicry in architecture?

(A) Burj Khalifa

(B) Lotus Temple, New Delhi

(C) The Shard, London

(D) One World Trade Center

Q90. Photography as a science and art relies on which physical principle?

(A) Nuclear reactions

(B) The interaction of light with photosensitive materials (chemistry and optics)

(C) Magnetic fields

(D) Gravity waves

Q91. An 'infographic' is best described as:

(A) A type of photograph

(B) A visual representation of data or information using design elements

(C) A digital painting

(D) A form of abstract art

Q92. The field of 'neuroaesthetics' studies:

(A) Brain surgery techniques

(B) How the brain processes and responds to art and beauty

(C) Neurological diseases and art therapy only

(D) The mathematics of visual art

Q93. Which color model is typically used in digital design/screens?

(A) CMYK

(B) RGB

(C) RYB

(D) HSV only

Q94. Sound design in films uses the science of acoustics to:

(A) Only add music

(B) Create and manipulate audio elements to enhance storytelling and realism

(C) Eliminate all background noise

(D) Record dialogue only

Q95. Which ancient Greek mathematician is considered the founder of formal geometry?

(A) Pythagoras

(B) Euclid

(C) Archimedes

(D) Thales

Q96. The architectural technique of 'entasis' (slight bulge in columns) corrects:

(A) Weight distribution

(B) Optical illusion of concavity that straight columns would produce

(C) Wind resistance

(D) Temperature expansion

Q97. Which art form involves creating images by arranging small pieces of colored glass or stone?

(A) Fresco

(B) Mosaic

(C) Bas-relief

(D) Encaustic

Q98. The 'rule of thirds' in photography is based on:

(A) Chemistry of film

(B) Dividing the frame into thirds to create more balanced, engaging compositions

(C) The speed of light

(D) ISO standards

Q99. Which Indian classical dance form, originating from Kerala, is known for elaborate costumes and eye movements?

(A) Bharatanatyam

(B) Kathakali

(C) Odissi

(D) Manipuri

Q100. Computer-Aided Design (CAD) software revolutionized architecture and engineering by enabling:

(A) Hand-drawn blueprints

(B) Precise 3D digital modeling and simulation before construction

(C) Faster manual calculations

(D) Removal of architects from the design process

Q101. The Alhambra palace in Spain is renowned for its:

(A) Gothic stained glass

(B) Islamic geometric patterns and arabesque tilework

(C) Renaissance frescoes

(D) Baroque fountains

Q102. Origami, the Japanese art of paper folding, has applications in modern science such as:

(A) Food preservation

(B) Designing space telescope lenses and medical stents

(C) Water purification

(D) Semiconductor manufacturing

Q103. The 'Bauhaus' school in Germany was significant because it:

(A) Focused only on painting

(B) Integrated art, craft, and technology into a unified design philosophy

(C) Rejected the use of technology in art

(D) Was exclusively a music conservatory

Q104. Perspective drawing in visual art is based on:

(A) Emotional expression

(B) Mathematical principles of how parallel lines appear to converge at a vanishing point

(C) Random placement of objects

(D) Photography techniques

Q105. The wavelength of visible light determines its:

(A) Intensity

(B) Color

(C) Speed

(D) Frequency only

Q106. Parametric design in architecture uses:

(A) Fixed templates only

(B) Algorithms and parameters to generate complex forms and structures

(C) Hand-drawn blueprints exclusively

(D) Historical style references

Q107. Sound synthesis in electronic music most directly involves:

(A) Acoustic physics and wave manipulation

(B) Biological processes

(C) Chemical reactions

(D) Gravitational forces

Q108. What principle explains why a spinning top remains upright?

(A) Calculus

(B) Gyroscopic precession and angular momentum

(C) Trigonometry

(D) Set theory

Q109. Cave paintings found at Bhimbetka, India, represent some of the world's oldest examples of:

(A) Written language

(B) Human artistic expression dating back approximately 30,000 years

(C) Mathematical notation

(D) Agricultural records

Q110. The design of the Sydney Opera House is an example of:

(A) Gothic revival architecture

(B) Expressionist architecture using shell-like curved roof forms

(C) Modernist minimalism

(D) Ancient Roman architecture

CATEGORY 3: Technology & the Digital World

Q111. What does 'CPU' stand for?

(A) Central Programming Unit

(B) Central Processing Unit

(C) Computer Power Unit

(D) Core Processing Utility

Q112. Which number system uses only digits 0 and 1?

(A) Decimal

(B) Hexadecimal

(C) Binary

(D) Octal

Q113. RAM (Random Access Memory) is considered which type of storage?

(A) Permanent storage

(B) Temporary/volatile storage

(C) Optical storage

(D) Cloud storage

Q114. What is the purpose of an operating system?

(A) To connect to the internet

(B) To manage hardware resources and provide services for software

(C) To create documents

(D) To store data permanently

Q115. Which of the following is a high-level programming language?

(A) Machine code

(B) Assembly language

(C) Python

(D) Binary

Q116. What does 'open source software' mean?

(A) Software available only on open networks

(B) Software whose source code is freely available to view, modify, and distribute

(C) Free software with no developers

(D) Software without a user interface

Q117. What is an 'algorithm' in computer science?

(A) A type of computer virus

(B) A step-by-step set of instructions to solve a problem

(C) A programming language

(D) A hardware component

Q118. Which data structure operates on a 'First In, First Out' (FIFO) principle?

(A) Stack

(B) Queue

(C) Tree

(D) Graph

Q119. What does 'debugging' refer to in software development?

(A) Inserting insects into code

(B) Finding and fixing errors in a program

(C) Writing new code

(D) Testing hardware

Q120. HTML stands for:

(A) Hyper Text Machine Language

(B) Hyper Text Markup Language

(C) High Transfer Multimedia Language

(D) Hybrid Text Management Language

Q121. Which protocol is used to transfer web pages from servers to browsers?

(A) FTP

(B) SMTP

(C) HTTP/HTTPS

(D) SSH

Q122. What is 'cloud computing'?

(A) Computing done using weather forecasting

(B) Delivering computing services over the internet

(C) Using computers in aircrafts

(D) A type of wireless network

Q123. Machine learning is a subset of:

(A) Mechanical engineering

(B) Artificial Intelligence

(C) Robotics exclusively

(D) Quantum computing

Q124. Which type of AI learning uses labeled datasets to train models?

(A) Unsupervised learning

(B) Supervised learning

(C) Reinforcement learning

(D) Transfer learning

Q125. Natural Language Processing (NLP) enables computers to:

(A) Process visual data only

(B) Understand, interpret, and generate human language

(C) Build physical structures

(D) Control robotic arms

Q126. A neural network is inspired by:

(A) The structure of silicon chips

(B) The human brain's biological neural structure

(C) Electrical circuit diagrams

(D) Mathematical set theory

Q127. What is the primary purpose of agricultural drones in precision farming?

(A) Entertainment

(B) Monitoring crop health, spraying pesticides, and mapping fields

(C) Social media content creation

(D) Weather forecasting only

Q128. Which technology allows computers to identify images and videos?

(A) Natural Language Processing

(B) Computer Vision

(C) Blockchain

(D) Augmented Reality

Q129. The 'Internet of Things' (IoT) refers to:

(A) Social media networks

(B) A network of physical devices connected and sharing data via the internet

(C) The deep web

(D) Quantum internet

Q130. Which AI application is used in hospitals to assist in diagnosing diseases from medical images?

(A) Chatbots

(B) AI-powered diagnostic imaging systems (e.g., detecting cancer in X-rays)

(C) Video games

(D) Weather prediction AI

Q131. What is 'bias' in an AI model?

(A) A faster processor

(B) Systematic error in AI outputs due to flawed training data or design

(C) A hardware malfunction

(D) Encrypted data

Q132. What is 'phishing' in the context of cybersecurity?

(A) A data storage technique

(B) A fraudulent attempt to obtain sensitive information by pretending to be a trustworthy entity

(C) A type of firewall

(D) Legal hacking

Q133. Two-factor authentication (2FA) improves security by:

(A) Requiring a longer password

(B) Requiring two different forms of verification to access an account

(C) Using two computers simultaneously

(D) Encrypting all data

Q134. What does a 'VPN' (Virtual Private Network) do?

(A) Speeds up your internet connection

(B) Creates an encrypted connection to protect data and mask your online identity

(C) Stores your passwords

(D) Provides free internet access

Q135. Which practice is considered good digital etiquette (netiquette)?

(A) Typing in ALL CAPS to emphasize points

(B) Responding respectfully and considering others' perspectives online

(C) Sharing others' personal information freely

(D) Ignoring all online interactions

Q136. What is ransomware?

(A) Software that speeds up computers

(B) Malicious software that encrypts data and demands payment for decryption

(C) A type of antivirus

(D) Legitimate paid software

Q137. The principle of 'least privilege' in cybersecurity means:

(A) Giving all users maximum access

(B) Giving users only the minimum access they need to do their job

(C) Ignoring access controls

(D) Using the weakest passwords allowed

Q138. Which South Korean company is one of the world's largest producers of semiconductor memory chips?

(A) Toyota

(B) Samsung

(C) Alibaba

(D) Tata

Q139. Japan's 'bullet train' (Shinkansen) is a major innovation in:

(A) Space technology

(B) High-speed rail transport

(C) Computing

(D) Medical technology

Q140. Which Chinese company developed the TikTok social media platform?

(A) Alibaba

(B) Tencent

(C) ByteDance

(D) Baidu

Q141. India's UPI (Unified Payments Interface) is globally recognized as an innovation in:

(A) Space exploration

(B) Instant digital payment systems

(C) Agricultural technology

(D) Artificial Intelligence

Q142. Taiwan's TSMC is famous for:

(A) Automobile manufacturing

(B) Being the world's leading contract chipmaker

(C) Aerospace engineering

(D) Pharmaceutical production

Q143. Which Asian country launched the 'Digital India' initiative?

(A) China

(B) Japan

(C) India

(D) South Korea

Q144. What does 'Big Data' refer to in technology?

(A) Computers with large screens

(B) Extremely large datasets requiring advanced processing tools to analyze

(C) Data stored in big buildings

(D) High-resolution images

Q145. Which Asian country pioneered the world's first 5G network launch?

(A) China

(B) Japan

(C) India

(D) South Korea

Q146. Blockchain technology is characterized by being:

(A) Centralized and editable

(B) A decentralized, immutable, distributed ledger

(C) A type of social media

(D) Exclusively used for cryptocurrency

Q147. What does 'latency' mean in the context of networks?

(A) Data storage capacity

(B) The delay between sending and receiving data

(C) Connection speed in Mbps

(D) Number of users on a network

Q148. The acronym 'AR' in technology stands for:

(A) Automated Robotics

(B) Augmented Reality

(C) Artificial Reasoning

(D) Advanced Rendering

Q149. Which of the following best describes 'edge computing'?

(A) Computing at the physical edge of buildings

(B) Processing data closer to its source rather than in centralized cloud servers

(C) Using the oldest/most basic computers

(D) Computing at the edge of a country's borders

Q150. What is the primary purpose of a 'firewall' in computing?

(A) To speed up internet connections

(B) To monitor and control incoming/outgoing network traffic based on security rules

(C) To store backup data

(D) To compress files

Q151. The concept of 'digital twin' refers to:

(A) Two identical computers

(B) A virtual replica of a physical system used for simulation and analysis

(C) Duplicate data backups

(D) Mirror websites

Q152. What does 'API' stand for in software development?

(A) Application Processing Interface

(B) Application Programming Interface

(C) Automated Program Instruction

(D) Advanced Program Integration

Q153. Which sorting algorithm has the best average-case time complexity?

(A) Bubble sort O(n^2)

(B) QuickSort O(n log n)

(C) Selection sort O(n^2)

(D) Insertion sort O(n^2)

Q154. In cybersecurity, 'social engineering' refers to:

(A) Building secure software systems

(B) Manipulating people into divulging confidential information

(C) Engineering social media platforms

(D) Creating community networks

Q155. Which is an example of 'supervised learning' in AI?

(A) A robot exploring an unknown room

(B) A spam email filter trained on labeled spam/not-spam data

(C) An algorithm clustering similar customers

(D) An AI playing chess against itself

Q156. Moore's Law originally predicted that:

(A) Internet speeds double every year

(B) The number of transistors on a chip doubles approximately every two years

(C) Computer memory costs halve every 18 months

(D) AI capability doubles every year

Q157. GPS (Global Positioning System) relies on which scientific principle for accurate timing?

(A) Quantum mechanics

(B) Einstein's theory of special and general relativity for atomic clock corrections

(C) Newtonian mechanics alone

(D) Electromagnetic induction

Q158. Japan's 'Society 5.0' concept envisions:

(A) A purely industrial society

(B) A human-centered society integrating cyberspace and physical space using technology

(C) A society returning to agricultural roots

(D) A military-focused technological

society Q159. What is 'explainable AI' (XAI)?

(A) AI that can speak any language

(B) AI systems designed so humans can understand and interpret how decisions are made

(C) AI with exploding performance metrics

(D) AI used only in education

CATEGORY 4: Current Affairs & Contemporary STEAM

Q160. The James Webb Space Telescope (JWST) primarily observes the universe in:

(A) Visible light only

(B) Infrared light

(C) X-rays

(D) Radio waves

Q161. CRISPR-Cas9 is a revolutionary technology used for:

(A) Data encryption

(B) Gene editing with precision

(C) Quantum computing

(D) Space navigation

Q162. What is 'quantum supremacy' in computing?

(A) The fastest classical computer

(B) When a quantum computer performs a task impossibly fast for classical computers

(C) A quantum physics theory

(D) Supremacy of quantum mechanics over relativity

Q163. Electric vehicles (EVs) primarily use which type of energy storage?

(A) Hydrogen fuel cells exclusively

(B) Lithium-ion batteries

(C) Capacitors

(D) Solar panels directly

Q164. mRNA vaccines, used against COVID-19, work by:

(A) Introducing a weakened virus

(B) Providing genetic instructions for cells to produce a protein that triggers immunity

(C) Using antibodies from recovered patients

(D) Chemical synthesis of immunity

Q165. What is 'dark matter'?

(A) Black holes

(B) An undetected substance making up approximately 27% of the universe's mass-energy

(C) Dark-colored stars

(D) Antimatter

Q166. Generative AI refers to AI that:

(A) Destroys existing data

(B) Creates new content (text, images, music) based on patterns learned from data

(C) Only analyzes existing content

(D) Controls physical robots

Q167. SpaceX's Falcon 9 rocket is notable for being:

(A) The first rocket to reach the moon

(B) The first orbital rocket with reusable boosters

(C) The most powerful rocket ever built

(D) A nuclear-powered rocket

Q168. What is the 'metaverse'?

(A) The physical universe

(B) A collective virtual shared space integrating augmented and virtual reality

(C) A social media platform

(D) A type of internet browser

Q169. 5G technology differs from 4G primarily in:

(A) Using different satellite systems

(B) Significantly higher data speeds, lower latency, and greater capacity

(C) Being available only in developed countries

(D) Using radio waves for the first time

Q170. The Nobel Prize in Physics 2023 was awarded for discoveries related to:

(A) Gravitational waves

(B) Attosecond pulses of light to study electron dynamics

(C) Black hole imaging

(D) Quantum entanglement

Q171. The Nobel Prize in Chemistry 2020 was awarded to Jennifer Doudna and Emmanuelle Charpentier for:

(A) Discovering a new antibiotic

(B) Development of the CRISPR-Cas9 method for genome editing

(C) Nobel Prize in Physics

(D) Protein structure determination

Q172. Geoffrey Hinton, awarded the Nobel Prize in Physics 2024, is known as:

(A) The inventor of the internet

(B) The Godfather of AI/Deep Learning

(C) The discoverer of gravitational waves

(D) The creator of blockchain

Q173. Katalin Karikó and Drew Weissman received the Nobel Prize in Physiology/Medicine 2023 for:

(A) Discovering a new antibiotic

(B) Discoveries enabling development of mRNA vaccines

(C) Mapping the human genome

(D) Developing CAR-T cell therapy

Q174. The Nobel Peace Prize 2023 was awarded to:

(A) Greta Thunberg

(B) Narges Mohammadi for her fight against women's oppression in Iran

(C) The United Nations Climate Panel

(D) A group of scientists

Q175. Peter Higgs and Francois Englert won the 2013 Nobel Prize in Physics for predicting:

(A) Dark matter

(B) The Higgs boson (the 'God particle')

(C) Quantum entanglement

(D) Gravitational waves

Q176. The Abel Prize is awarded in the field of:

(A) Physics

(B) Mathematics

(C) Chemistry

(D) Computer Science

Q177. Which Asian scientist received the Nobel Prize in Chemistry 2019 for contributions to lithium-ion batteries?

(A) Akira Yoshino

(B) Shinya Yamanaka

(C) Ryoji Noyori

(D) Koichi Tanaka

Q178. What is a 'STEAM fair' or 'science olympiad' primarily designed to do?

(A) Sell science products

(B) Encourage students to apply STEAM concepts to solve real-world problems

(C) Award prizes to teachers

(D) Replace classroom learning

Q179. Boyan Slat founded The Ocean Cleanup project at age 18 to:

(A) Build undersea hotels

(B) Develop technology to remove plastic from the oceans

(C) Create underwater farming

(D) Map ocean trenches

Q180. In which annual competition do high school students build robots for alliance-based challenges?

(A) Google Science Fair

(B) FIRST Robotics Competition

(C) Intel ISEF

(D) MIT Math Tournament

Q181. The Intel International Science and Engineering Fair (ISEF) is significant because:

(A) It is only for college students

(B) It is the world's largest international pre-college science competition

(C) It focuses only on engineering

(D) It awards prizes based on popularity

Q182. What is 'citizen science'?

(A) Science conducted only by government employees

(B) Scientific research conducted with participation of the general public

(C) Science in democratic countries only

(D) Civic education programs

Q183. Vinisha Umashankar from India created an eco-friendly alternative to:

(A) Plastic bags

(B) Coal-powered ironing carts using solar energy

(C) Petrol-run motorcycles

(D) Single-use cups

Q184. How many UN Sustainable Development Goals (SDGs) are there?

(A) 10

(B) 15

(C) 17

(D) 20

Q185. Which SDG focuses on affordable and clean energy?

(A) SDG 3

(B) SDG 7

(C) SDG 11

(D) SDG 14

Q186. SDG 13 targets:

(A) Zero hunger

(B) Climate action

(C) Quality education

(D) Life below water

Q187. How does AI contribute to SDG 3 (Good Health and Well-being)?

(A) By replacing all doctors

(B) By enabling faster drug discovery and early disease detection

(C) By reducing hospital costs to zero

(D) By providing free medicines

Q188. 'Blue economy' in the context of SDGs refers to:

(A) Countries with blue flags

(B) Sustainable use of ocean resources for economic growth

(C) Banking systems globally

(D) Water-based art

Q189. SDG 4 specifically calls for:

(A) Clean water and sanitation

(B) Quality education and lifelong learning opportunities for all

(C) Sustainable cities

(D) Responsible consumption

Q190. Which technology is most directly linked to achieving SDG 7 (Affordable and Clean Energy)?

(A) Coal mining automation

(B) Renewable energy (solar, wind, hydro) technology

(C) Fossil fuel exploration

(D) Nuclear fission reactors only

Q191. The concept of a 'circular economy' relates most closely to which SDG?

(A) SDG 1 (No Poverty)

(B) SDG 12 (Responsible Consumption and Production)

(C) SDG 5 (Gender Equality)

(D) SDG 16 (Peace and Justice)

Q192. STEM education contributes to SDG 9 (Industry, Innovation, and Infrastructure) by:

(A) Teaching sports

(B) Building the skilled workforce needed for technological innovation

(C) Providing financial capital

(D) Managing international trade

Q193. Which global agreement aligns STEAM education with climate SDGs?

(A) NATO Treaty

(B) Paris Agreement (2015)

(C) Kyoto Protocol exclusively

(D) Geneva Convention

Q194. 'Green hydrogen' produced via electrolysis from renewable energy is an example of innovation for:

(A) SDG 2 (Zero Hunger)

(B) SDG 7 and SDG 13 (Clean Energy and Climate Action)

(C) SDG 16 (Peace)

(D) SDG 10 (Reduced Inequalities)

Q195. The Paris Agreement aims to limit global average temperature increase to below:

(A) 3 degrees C above pre-industrial levels

(B) 2 degrees C, pursuing efforts to limit to 1.5 degrees C above pre-industrial levels

(C) 1 degree C above 1990 levels

(D) 4 degrees C above current levels

Q196. ITER, the world's largest nuclear fusion project, aims to demonstrate:

(A) Nuclear fission power

(B) Fusion energy producing more energy than it consumes (net energy gain)

(C) Solar energy storage

(D) Wind energy efficiency

Q197. The 'One Health' approach recognizes that:

(A) Only human health matters in medicine

(B) Human, animal, and environmental health are deeply interconnected

(C) Medical research should focus on one disease at a time

(D) One country should lead global health

Q198. Which material is at the center of most electric vehicle battery research?

(A) Lead

(B) Lithium (in various compounds)

(C) Nickel only

(D) Hydrogen

Q199. The concept of 'net zero emissions' means:

(A) Zero carbon dioxide in the atmosphere

(B) Balancing the amount of greenhouse gases produced with the amount removed

(C) No industrial activity

(D) Using only nuclear energy

Q200. Telemedicine supports which SDG primarily?

(A) SDG 2 (Zero Hunger)

(B) SDG 3 (Good Health and Well-being)

(C) SDG 9 (Industry)

(D) SDG 11 (Sustainable Cities)

Q201. The Nobel Prize in Physics 2022 was awarded for experiments on:

(A) Black hole formation

(B) Quantum entanglement, disproving local hidden variables (Bell inequalities)

(C) Gravitational waves

(D) Neutrino oscillations

Q202. Which technology is used to create affordable 3D-printed prosthetic limbs?

(A) Blockchain

(B) Additive manufacturing (3D printing)

(C) Virtual reality

(D) Nanotechnology

Q203. The field of 'synthetic biology' involves:

(A) Writing fiction about biology

(B) Engineering or redesigning biological parts, devices, and systems for useful purposes

(C) Traditional animal breeding

(D) Studying extinct species only

Q204. What was a major scientific milestone achieved by the Event Horizon Telescope collaboration?

(A) Landing on Mars

(B) Capturing the first image of a black hole's event horizon

(C) Discovering a new planet

(D) Detecting gravitational waves for the first time

Q205. Which country became the first to commit to 'carbon neutrality' by 2060 as a national policy?

(A) USA

(B) China

(C) Germany

(D) India

ANSWER KEY

Q#	Ans	Q#	Ans	Q#	Ans	Q#	Ans	Q#	Ans
1	**(C)**	2	**(B)**	3	**(C)**	4	**(B)**	5	**(A)**
6	**(B)**	7	**(B)**	8	**(C)**	9	**(C)**	10	**(B)**
11	**(B)**	12	**(C)**	13	**(B)**	14	**(B)**	15	**(B)**
16	**(B)**	17	**(B)**	18	**(B)**	19	**(B)**	20	**(B)**
21	**(B)**	22	**(B)**	23	**(C)**	24	**(B)**	25	**(B)**
26	**(B)**	27	**(B)**	28	**(B)**	29	**(B)**	30	**(B)**
31	**(B)**	32	**(B)**	33	**(B)**	34	**(B)**	35	**(B)**
36	**(B)**	37	**(B)**	38	**(B)**	39	**(B)**	40	**(B)**
41	**(B)**	42	**(B)**	43	**(B)**	44	**(B)**	45	**(B)**
46	**(B)**	47	**(B)**	48	**(B)**	49	**(B)**	50	**(B)**
51	**(C)**	52	**(B)**	53	**(A)**	54	**(B)**	55	**(C)**
56	**(B)**	57	**(B)**	58	**(B)**	59	**(B)**	60	**(B)**
61	**(B)**	62	**(C)**	63	**(B)**	64	**(B)**	65	**(B)**
66	**(B)**	67	**(B)**	68	**(B)**	69	**(B)**	70	**(B)**
71	**(B)**	72	**(B)**	73	**(B)**	74	**(B)**	75	**(B)**
76	**(B)**	77	**(B)**	78	**(B)**	79	**(B)**	80	**(B)**
81	**(B)**	82	**(B)**	83	**(B)**	84	**(B)**	85	**(B)**
86	**(B)**	87	**(B)**	88	**(B)**	89	**(B)**	90	**(B)**
91	**(B)**	92	**(B)**	93	**(B)**	94	**(B)**	95	**(B)**
96	**(B)**	97	**(B)**	98	**(B)**	99	**(B)**	100	**(B)**
101	**(B)**	102	**(B)**	103	**(B)**	104	**(B)**	105	**(B)**
106	**(B)**	107	**(A)**	108	**(B)**	109	**(B)**	110	**(B)**
111	**(B)**	112	**(C)**	113	**(B)**	114	**(B)**	115	**(C)**
116	**(B)**	117	**(B)**	118	**(B)**	119	**(B)**	120	**(B)**

121	**(C)**	122	**(B)**	123	**(B)**	124	**(B)**	125	**(B)**
126	**(B)**	127	**(B)**	128	**(B)**	129	**(B)**	130	**(B)**
131	**(B)**	132	**(B)**	133	**(B)**	134	**(B)**	135	**(B)**
136	**(B)**	137	**(B)**	138	**(B)**	139	**(B)**	140	**(C)**
141	**(B)**	142	**(B)**	143	**(C)**	144	**(B)**	145	**(D)**
146	**(B)**	147	**(B)**	148	**(B)**	149	**(B)**	150	**(B)**
151	**(B)**	152	**(B)**	153	**(B)**	154	**(B)**	155	**(B)**
156	**(B)**	157	**(B)**	158	**(B)**	159	**(B)**	160	**(B)**
161	**(B)**	162	**(B)**	163	**(B)**	164	**(B)**	165	**(B)**
166	**(B)**	167	**(B)**	168	**(B)**	169	**(B)**	170	**(B)**
171	**(B)**	172	**(B)**	173	**(B)**	174	**(B)**	175	**(B)**
176	**(B)**	177	**(A)**	178	**(B)**	179	**(B)**	180	**(B)**
181	**(B)**	182	**(B)**	183	**(B)**	184	**(C)**	185	**(B)**
186	**(B)**	187	**(B)**	188	**(B)**	189	**(B)**	190	**(B)**
191	**(B)**	192	**(B)**	193	**(B)**	194	**(B)**	195	**(B)**
196	**(B)**	197	**(B)**	198	**(B)**	199	**(B)**	200	**(B)**
201	**(B)**	202	**(B)**	203	**(B)**	204	**(B)**	205	**(B)**