Online RTI Status Form

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Name	Ayushman Banerjee
Received Date	30/06/2022
Public Authority	National Council of Science Museums.(Hqrs./CRTL)
Status	REQUEST DISPOSED OF
Date of action	11/07/2022
Reply :- The information have been furnished to your e-mail ID as attachments.	
CPIO Details :-	Sri Subhashis Paul Phone: 03322877241 ao[at]bitm[dot]gov[dot]in
First Appellate Authority Details :-	Shri Rajib Nath Phone: 03322877241 r_nath[at]bitm[dot]gov[dot]in
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From: Dy.CoA BITM <ao@bitm.gov.in>
Sent: 11 July 2022 13:15
To: 'ayushmanbanerjee1120000@gmail.com'
Subject: Reply to your RTI query
Attachments: Question Paper_Advt. No. 1_2022.pdf; Question Paper_Advt. No.1_2021.pdf

Msg. for: Shri Ayushman Banerjee

Msg. from: Deputy Controller of Administration & CPIO, Birla Industrial & Technological Museum, Kolkata

This refers to your RTI Application No. NCSHQ/R/E/22/2013 dated 30.06.2022. The information as sought by you are furnished in the attachments.

Regards.

Ministry of Culture
Government of India

शुभाशीष पॉल/Subhashis Paul
उप नियंत्रक (प्रशासन)/Deputy Controller of Administration
बिड़ला औद्योगिक तथा प्रौद्योगिक संग्रहालय/Birla Industrial & Technological Museum
(राष्ट्रीय विज्ञान संग्रहालय परिषद/National Council of Science Museums)
संस्कृति मंत्रालय/Ministry of Culture
भारत सरकार/Govt. of India
19 ए, गुरुसदय रोड, कोलकाता – 700 019/19 A, Gurusaday Road, Kolkata - 700 019
दूरभाष/Telephone: (033) 22877241/42/43

Advt.NO. 01/2021 (NATIONAL COUNCIL OF SCIENCE MUSEUMS)
MINISTRY OF CULTURE, GOVT. OF INDIA

Recruitment of Education Assistant 'A' at SC, Bardhaman.
Exam. held on 04/03/2021.

MINISTRY OF CULTURE, GOVT. OF INDIA

Name of the candidate :	Father's name :
Contact mobile no. : Roll Number :	Signature with date :

WRITTEN TEST FOR SELECTION OF EDUCATION ASSISTANT 'A'

Maximum Marks: 100 Maximum Time: 3 hours

Section-A (60 Marks)

(Multiple Choice)

Mark the correct option in the column of the table given in the last. Rough work (if any) may be done in the space provided for the purpose. Please return the question paper/answer sheet to the invigilator within the given time limit. There is no negative marking. Question numbers 1 to 60 carry 1 mark each.

Q1. A short pulse of white light is incident from air to a glass slab at normal incidence. After travelling through the slab, the first colour to emerge is
(a) blue (b) green
(c) violet (d) red

Q2. Which of the following statements about a compound is incorrect?
(a) A molecule of a compound has atoms of different elements.
(b) A compound cannot be separated into its constituent elements by physical methods of separation.
(c) A compound retains the physical properties of its constituent elements.
(d) The ratio of atoms of different elements in a compound is fixed.

Q3. Which metal ion is a constituent of chlorophyll?
(a) Iron (b) Copper
(c) Magnesium (d) Zinc

Q4. A body is falling freely under the action of gravity alone in vacuum. Which of the following quantities remain constant during the fall?
(a) Kinetic energy.
(b) Potential energy.
(c) Total mechanical energy.
(d) Total linear momentum.

Q5. In which of the following, functional group isomerism is not possible?
(a) Alcohols (b) Aldehydes
(c) Alkyl halides (d) Cyanides

Q6. Growth can be measured in various ways. Which of these can be used as parameters to measure growth
(a) Increase in cell number (b) Increase in cell size
(c) Increase in length and weight (d) All the above

Q7. During rainbow formation, a passenger in an aeroplane
(a) shall never see a rainbow.
(b) may see a primary and a secondary rainbow as concentric circles.
(c) may see a primary and a secondary rainbow as concentric arcs.
(d) shall never see a secondary rainbow.

Q8. The state of a gas can be described by quoting the relationship between_____.
(a) pressure, volume, temperature
(b) temperature, amount, pressure
(c) amount, volume, temperature
(d) pressure, volume, temperature, amount

Q9. Which of the following is not a lymphoid tissue?
(a) Spleen (b) Tonsils
(c) Pancreas (d) Thymus

Q10. In a permanent magnet at room temperature
(a) magnetic moment of each molecule is zero.
(b) the individual molecules have non-zero magnetic moment which are all perfectly aligned.
(c) domains are partially aligned.
(d) domains are all perfectly aligned.

Q11. The period number in the long form of the periodic table is equal to
(a) magnetic quantum number of any element of the period.
(b) atomic number of any element of the period.
(c) maximum Principal quantum number of any element of the period.
(d) maximum Azimuthal quantum number of any element of the period.

Q12. Which of the following glands is large sized at birth but reduces in size with ageing?
(a) Pineal (b) Pituitary
(c) Thymus (d) Thyroid

Q13. Motion of an oscillating liquid column in a U-tube is
(a) periodic but not simple harmonic
(b) non-periodic
(c) simple harmonic and time period is independent of the density of the liquid
(d) simple harmonic and time-period is directly proportional to the density of the liquid

Q14. As the temperature increases, average kinetic energy of molecules increases. What would be the effect of increase of temperature on pressure provided the volume is constant?
(a) increases (b) decreases
(c) remains same (d) becomes half

Q15. Which of the following organisms does not have both muscles and skeleton for movement?
(a) dog (b) snail
(c) earthworm (d) human being

Q16. Which of the following characteristics of electrons determines the current in a conductor?
(a) Drift velocity alone (b) Thermal velocity alone
(c) Both drift velocity and thermal velocity
(d) Neither drift nor thermal velocity

Q17. Sewage containing organic waste should not be disposed in water bodies because it causes major water pollution. Fishes in such a polluted water die because of
(a) Large number of mosquitoes
(b) Increase in the amount of dissolved oxygen
(c) Decrease in the amount of dissolved oxygen in water
(d) Clogging of gills by mud

Q18. Which of the following does not lose their nucleus at maturity?
(a) Companion cells (b) Red blood cells
(c) Vessel (d) Sieve tube cells

Q19. Which from the following is true for "Sound"?
(a) Sound cannot travel through a vacuum
(b) Sound cannot travel through gases
(c) Sound cannot travel through liquids
(d) Sound cannot travel through solids

Q20. The gas, commonly known as "laughing gas", is
(a) Carbon Dioxide (b) Sulphur Dioxide
(c) Nitrous Oxide (d) Sodium Oxide

Q21. Amphibians do not have the following
(a) Three chambered heart (b) Gills or lungs
(c) Scales (d) Mucus glands

Q22. Which of the following can be used to form a real image always?
(a) Concave mirror only (b) Plane mirror only
(c) Convex mirror only (d) None of these

Q23. What is Dry Ice?
(a) Solid Oxygen (b) Solid Nitrogen
(c) Solid Hydrogen (d) Solid Carbon Dioxide

Q24. Girth of stem increases due to
(a) apical meristem (b) lateral meristem
(c) intercalary meristem (d) vertical meristem

Q25. Which of the following statements is wrong?
(a) Ozone is not responsible for greenhouse effect.
(b) Ozone can oxidise sulphur dioxide present in the atmosphere to sulphur trioxide.
(c) Ozone hole is thinning of ozone layer present in stratosphere.
(d) Ozone is produced in upper stratosphere by the action of UV rays on oxygen.

Q26. The _____ is the point of intersection of the three angle bisectors of a triangle.
(a) Incenter (b) Orthocenter
(c) Centroid (d) Circumcenter

Q27. "Every Drop Counts" is a slogan related to
(a) counting of drops of any liquid.
(b) counting of water drops.
(c) importance of water.
(d) importance of counting

Q28. What is the name of the instrument used to measure motions underground, including those of waves generated by earthquakes, volcanic eruptions?
(a) Seismometer (b) Anemometer
(c) Barometer (d) Thermometer

Q29. Every year, National Mathematics Day is observed on -
(a) 22nd September (b) 21st June
(c) 21st March (d) 22nd December

Q30. 1 nanometer = ?
(a) 10^{-3} meter (b) 10^{-6} meter
(c) 10^{-9} meter (d) 10^{-12} meter

Q31. The earth is an approximate sphere. If the interior contained matter which is not of the same density everywhere, then on the surface of the earth, the acceleration due to gravity
(a) will be directed towards the centre but not the same everywhere.
(b) will have the same value everywhere but not directed towards the centre.
(c) will be same everywhere in magnitude directed towards the centre.
(d) cannot be zero at any point.

Q32. The organisms which cause diseases in plants and animals are called:
(a) Pathogens (b) Vectors
(c) Insects (d) Worms

Q33. The oxidant which is used as an antiseptic is
(a) $KBrO_3$ (b) $KMnO_4$
(c) CrO_3 (d) KNO_3

Q34. A hockey player is moving northward and suddenly turns westward with the same speed to avoid an opponent. The force that acts on the player is
(a) frictional force along westward.
(b) muscle force along southward.
(c) frictional force along south-west.
(d) muscle force along south-west.

Q35. In malignant tumors, the cells proliferate, grow rapidly and move to other parts of the body to form new tumors. This stage of disease is called:
(a) metagenesis (b) metastasis
(c) teratogenesis (d) mitosis

Q36. Every rational number is
(a) a natural number (b) an integer
(c) a real number (d) a whole number

Q37. The change in seasons on the earth occurs because
(a) the distance between the earth and the sun is not constant.
(b) the axis of rotation of the earth is parallel to the plane of its orbit.
(c) the axis of rotation of the earth is perpendicular to the plane of its orbit.
(d) the axis of rotation of the earth is tilted with respect to the plane of its orbit.

Q38. If your diet is deficient in sour fruits then you are supposed to suffer from
(a) Rickets (b) Beri Beri
(c) Scurvy (d) Night blindness.

Q39. When a disc rotates with uniform angular velocity, which of the following is not true?
(a) The sense of rotation remains same.
(b) The orientation of the axis of rotation remains same.
(c) The speed of rotation is non-zero and remains same.
(d) The angular acceleration is non-zero and remains same.

Q40. Pick one material from the following which is completely soluble in water.
(a) Chalk powder (b) Tea leaves
(c) Glucose (d) Saw dust

Q41. Spinal cord originates from:
(a) Cerebrum (b) Cerebellum
(c) Medulla (d) Pons

Q42. Which of the following letters does not have any line of symmetry?
(a) E (b) T
(c) N (d) X

Q43. BOD of waste water is estimated by measuring the amount of:
(a) total organic matter
(b) biodegradable organic matter
(c) oxygen evolution
(d) oxygen consumption

Q44. Which of the following statements about the electron is incorrect?
(a) It is a negatively charged particle.
(b) The mass of electron is equal to the mass of neutron.
(c) It is a basic constituent of all atoms.
(d) It is a constituent of cathode rays

Q45. Which gas is produced on burning of fossil fuels?
(a) Sulphur dioxide (b) Oxygen
(c) Nitrogen (d) Carbon dioxide

Q46. The primary treatment of waste water involves the removal of:
(a) dissolved impurities (b) stable particles
(c) toxic substances (d) harmful bacteria

Q47. He was a mathematician and physicist; best known for his collaboration with Albert Einstein in formulating a theory related to the gas like qualities of electromagnetic radiation. Name the scientist.
(a) P. C. Mahalanobis (b) Meghnad Saha
(c) S. Chandrasekhar (d) S. N. Bose

Q48. The clinical test that is used for diagnosis of typhoid is:
(a) ELISA (b) ESR
(c) PCR (d) Widal

Q49. The maximum load a wire can withstand without breaking, when its length is reduced to half of its original length, will
(a) be double.
(b) be half.
(c) be four times.
(d) remain same.

Q50. Ice is floating on water in a beaker when ice completely melts then level of water in beaker:
(a) Increases (b) Remains the same
(c) Decreases (d) First increases then decreases

Q51. Which of the following is used as an atmospheric pollution indicator?
(a) Lepidoptera (b) Lichens
(c) Lycopersicon (d) Lycopodium

Q52. Ultrasound has frequency of vibration
(a) between 20 and 20,000 Hz
(b) below 20 Hz
(c) above 20,000 Hz
(d) between 500 and 10,000 Hz

Q53.'Smack' is a drug obtained from the:
(a) latex of Papaver somniferum
(b) leaves of Cannabis sativa
(c) flowers of Dhatura
(d) fruits of Erythroxyl coca

Q54. Which of the following pairs of physical quantities does not have same dimensional formula?
(a) Work and torque.
(b) Angular momentum and Planck's constant.
(c) Tension and surface tension.
(d) Impulse and linear momentum.

Q55. Animal husbandry and plant breeding programmes are the examples of:
(a) reverse evolution (b) artificial selection
(c) mutation (d) natural selection

Q56. Which one of the following is true for all chemical reactions?
(a) There is a change in volume
(b) Heat is evolved
(c) Chemical bonds are broken or formed
(d) There is a change in mass

Q57. The term "water-pollution" can be defined in several ways. Which of the following statements does not give the correct definition?
(a) The addition of undesirable substances to water-bodies
(b) The removal of desirable substances from water-bodies
(c) A change in pressure of the water bodies
(d) A change in temperature of the water bodies

Q58. All genes located on the same chromosome:
(a) Form different groups depending upon their relative distance
(b) Form one linkage group
(c) Will not from any linkage groups
(d) Form interactive groups that affect the phenotype

Q59. The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light
(a) is scattered the most by smoke or fog
(b) is scattered the least by smoke or fog
(c) is absorbed the most by smoke or fog
(d) moves fastest in air

Q60. Rocket works on the principle of conservation of
(a) mass (b) energy
(c) momentum (d) velocity

Section-B (40 Marks)
(Physical Sciences)
(Descriptive type)

Note- Question numbers 1 to 5 carry 2 marks each. Question numbers 6 to 10 carry 4 marks each. Question 11 having two parts carries 5 marks each.

Q1. There are three solids made up of aluminium, steel and wood, of the same shape and same volume. Which of them would have highest inertia & why?

Q2. Can any object have momentum even if its mechanical energy is zero? Explain.

Q3. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify you answer.

Q4. You are given two samples of water labelled as 'A' and 'B'. Sample 'A' boils at 100°C and sample 'B' boils at 102°C. Which sample of water will not freeze at 0°C? Comment.

Q5. A body falls towards earth in air. Will its total mechanical energy be conserved during the fall? Justify.

Q6. Why does a metal bar appear hotter than a wooden bar at the same temperature? Equivalently it also appears cooler than wooden bar if they are both colder than room temperature.

Q7. Two bodies of unequal mass are moving in the same direction with equal kinetic energy. The two bodies are brought to rest by applying retarding force of same magnitude. How would the distance moved by them before coming to rest? Compare?

Q8. Pressure cooker is used for cooking food at hill station. Explain in terms of vapour pressure why is it so?

Q9. When 500 mL of water and 500 mL of ethanol are mixed the resulting volume is less than 1 L. How?

Q10. Two burning candles of same thickness and different length are covered by a tumbler glass. Which one will extinguish first or both will extinguish at the same time? Explain.

Q11. Write short notes on **any two** of the following:

(a) Black holes and the Milky Way's darkest secret
(b) Chemistry in Everyday Life
(c) Physics in Medical Diagnosis
(d) Heritage of Indian Science & Technology
(e) Science Popularisation in 21st Century

Section-B (40 Marks)
(Life Sciences)

5

(Descriptive type)

Note- Question numbers 1 to 5 carry 2 marks each. Question numbers 6 to 10 carry 4 marks each. Question 11 having two parts carries 5 marks each.

Q1. "All plants give out oxygen during day and carbon dioxide during night". Do you agree with this statement? Give reason.

Q2. A woman has only daughters. Analyse the situation genetically and provide a suitable explanation.

Q3. Give reasons why acquired characters are not inherited.

Q4. What is a clone? Why do offspring formed by asexual reproduction exhibit remarkable similarity?

Q5. A fluid filled double membranous layer surrounds the lungs. Name it and mention its important function.

Q6. Why is the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron but not the reverse?

Q7. Palm is a monocotyledonous plant, yet it increases in girth. Why and how?

Q8. Name the part of the alimentary canal where major absorption of digested food takes place. What are the absorbed forms of different kinds of food materials?

Q9. Differentiate between Blood and Lymph.

Q10. How does deforestation lead to frequent floods and droughts?

Q11. Write short notes on **any two** of the following:

(a) Climate change & Global warming
(b) COVID-19 pandemic –Prevention & Control
(c) Hepatitis – a global threat to human health
(d) Human Gene editing – Good or Bad?
(e) Endangered Species

Advt. No. 1/2022

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM
(NATIONAL COUNCIL OF SCIENCE MUSEUMS)
MINISTRY OF CULTURE, GOVT. OF INDIA
19A, GURUSADAY ROAD, KOLKATA – 700 019

Recruitment of Education Assistant 'A' at NBSC, Siliguri. Exam held on 23.03.2022.

Name of the candidate :	Roll No. :
Contact mobile no. :	Signature with date :

APTITUDE TEST FOR SELECTION OF EDUCATION ASSISTANT 'A'

Maximum Marks: 100 Maximum Time: 3 hours

Section-A (60 Marks)

(Multiple Choice)

Mark the correct option in the column of the table given in the last. Rough work (if any) may be done in the space provided for the purpose. Please return the question paper/answer sheet to the invigilator within the given time limit. There is no negative marking. Question numbers 1 to 60 carry 1 mark each.

Q1. The clear sky appears blue because
(a) blue light gets absorbed in the atmosphere
(b) ultraviolet radiations are absorbed in the atmosphere
(c) violet and blue lights get scattered more than lights of all other colours by the atmosphere
(d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere

Q2. Rahul visited a Natural Gas Compressing Unit and found that the gas can be liquefied under specific conditions of temperature and pressure. While sharing his experience with friends he got confused. Help him to identify the correct set of conditions
(a) Low temperature, low pressure
(b) High temperature, low pressure
(c) Low temperature, high pressure
(d) High temperature, high pressure

Q3. One of the following processes is not a step involved in the water-cycle operating in nature
(a) evaporation (b) transpiration
(c) precipitation (d) photosynthesis

Q4. A boy is whirling a stone tied with a string in an horizontal circular path. If the string breaks, the stone
(a) will continue to move in the circular path
(b) will move along a straight line towards the centre of the circular path
(c) will move along a straight line tangential to the circular path
(d) will move along a straight line perpendicular to the circular path away from the boy

Q5. The oxidant which is used as an antiseptic is
(a) $KBrO_3$ (b) $KMnO_4$
(c) CrO_3 (d) KNO_3

Q6. Fats are stored in human body as
(a) cuboidal epithelium (b) adipose tissue
(c) bones (d) cartilage

Q7. When we change feeble sound to loud sound we increase its
(a) frequency (b) amplitude
(c) velocity (d) wavelength

Q8. During summer, water kept in an earthen pot becomes cool because of the phenomenon of
(a) diffusion (b) transpiration
(c) osmosis (d) evaporation

Q9. Which of the following does not lose their nucleus at maturity?
(a) Companion cells (b) Red blood cells
(c) Vessel (d) Sieve tube cells

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(a) mass (b) energy
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(a) Concave mirror only (b) Plane mirror only
(c) Convex mirror only (d) None of these

Q12. If your diet is deficient in sour fruits then you are supposed to suffer from
(a) Rickets (b) Beri Beri
(c) Scurvy (d) Night blindness

Q13. The focal length of the eye lens increases when eye muscles
(a) are relaxed and lens becomes thinner
(b) contract and lens becomes thicker
(c) are relaxed and lens becomes thicker
(d) contract and lens becomes thinner

Q14. For a fixed mass of gas at constant temperature, if we decrease volume, the pressure will _____.
(a) also decrease (b) increase
(c) remains constant (d) none of these

Q15. A small baby plant coming out of a seed is called _____.
(a) Grain (b) Root
(c) Dispersal (d) Seedling

Q16. Twinkling of stars is due to atmospheric
(a) dispersion of light by water droplets
(b) refraction of light by different layers of varying refractive indices
(c) scattering of light by dust particles
(d) internal reflection of light by clouds

Q17. Diamond is an allotropic form of
(a) Carbon (b) Hydrogen
(c) Nitrogen (d) Silicon

Q18. The atmosphere of the earth is heated by radiations which are mainly
(a) radiated by the sun
(b) re-radiated by land
(c) re-radiated by water
(d) re-radiated by land and water

Q19. Which from the following is true for "Sound"?
(a) Sound cannot travel through a vacuum
(b) Sound cannot travel through gases
(c) Sound cannot travel through liquids
(d) Sound cannot travel through solids

Q20. The gas, commonly known as "laughing gas", is
(a) Carbon Dioxide (b) Sulphur Dioxide
(c) Nitrous Oxide (d) Sodium Oxide

Q21. Amphibians do not have the following
(a) Three chambered heart (b) Gills or lungs
(c) Scales (d) Mucus glands

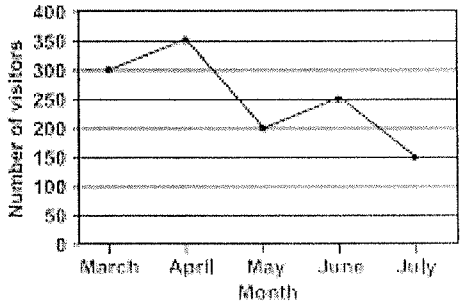
Q22. A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement?
(a) Water, air, wind (b) Air, sugar, oil
(c) Oxygen, water, sugar (d) Salt, juice, air

Q23. One of the following factors does not lead to soil formation in nature
(a) the sun (b) water
(c) wind (d) polythene bags

Q24. Girth of stem increases due to
(a) apical meristem (b) lateral meristem
(c) intercalary meristem (d) vertical meristem

Q25. Which of the following is not a greenhouse gas?
(a) Methane (b) Carbon dioxide
(c) Carbon monoxide (d) Ammonia

Q26. The line graph shows the number of people who visited a museum from March to July. How many more visitors were there in April than in June?



(a) 200 (b) 350
(c) 150 **(d) 100**

Q27. "Every Drop Counts" is a slogan related to
(a) counting of drops of any liquid.
(b) counting of water drops.
(c) importance of water.
(d) importance of counting

Q28. Mountaineers carry oxygen cylinders with them because
(a) there is no oxygen on high mountains.
(b) there is deficiency of oxygen on mountains at high altitude.
(c) oxygen is used for cooking.
(d) oxygen keeps them warm at low temperature.

Q29. When we blow air into the balloon it inflates because:
(a) Air particles diffuse into the balloon
(b) The temperature of air in the balloon increases
(c) Air particles collide with the walls of the balloon and exert pressure on them
(d) Rubber is elastic in nature

Q30. 1 nanometer = ?
(a) 10^{-3} meter (b) 10^{-6} meter
(c) 10^{-9} meter (d) 10^{-12} meter

Q31. The term "water-pollution" can be defined in several ways. Which of the following statements does not give the correct definition?
(a) The addition of undesirable substances to water-bodies
(b) The removal of desirable substances from water-bodies
(c) A change in pressure of the water bodies
(d) A change in temperature of the water bodies

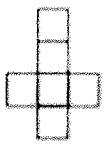
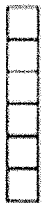
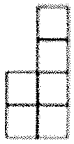
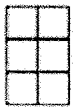
Q32. The organisms which cause diseases in plants and animals are called:
(a) Pathogens (b) Vectors
(c) Insects (d) Worms

Q33. The property to flow is unique to fluids. Which one of the following statements is correct?
(a) Only gases behave like fluids
(b) Gases and solids behave like fluids
(c) Gases and liquids behave like fluids
(d) Only liquids are fluids

Q34. A hockey player is moving northward and suddenly turns westward with the same speed to avoid an opponent. The force that acts on the player is
(a) frictional force along westward.
(b) muscle force along southward.
(c) frictional force along south-west.
(d) muscle force along south-west.

Q35. In malignant tumors, the cells proliferate, grow rapidly and move to other parts of the body to form new tumors. This stage of disease is called:
(a) metagenesis (b) metastasis
(c) teratogenesis (d) mitosis

Q36. Which net, when folded, will cover all the faces of a cube?

(a) 
(b) 
(c) 
(d) 

Q37. Tincture of iodine has antiseptic properties. This solution is made by dissolving
(a) iodine in potassium iodide (b) iodine in vaseline
(c) iodine in water (d) iodine in alcohol

Q38. Which is not an aquatic animal?
(a) Hydra (b) Jelly fish
(c) Corals (d) Filaria

Q39. Before playing the orchestra in a musical concert, a sitarist tries to adjust the tension and pluck the string suitably. By doing so, he is adjusting
(a) intensity of sound only
(b) amplitude of sound only
(c) frequency of the sitar string with the frequency of other musical instruments
(d) loudness of sound

Q40. The value of acceleration due to gravity
(a) is same on equator and poles
(b) is least on poles
(c) is least on equator
(d) increases from pole to equator

Q41. Spinal cord originates from:
(a) Cerebrum (b) Cerebellum
(c) Medulla (d) Pons

Q42. Which of the following letters does not have any line of symmetry?
(a) E (b) T
(c) N (d) X

Q43. The total set of carbon emissions caused by an individual is called –
(a) carbon cycle (b) carbon handprint
(c) carbon footprint (d) carbon summary

Q44. Which of the following statements about the electron is incorrect?
(a) It is a negatively charged particle.
(b) The mass of electron is equal to the mass of neutron.
(c) It is a basic constituent of all atoms.
(d) It is a constituent of cathode rays

Q45. Which gas is produced on burning of fossil fuels?
(a) Sulphur dioxide (b) Oxygen
(c) Nitrogen (d) Carbon dioxide

Q46. The primary treatment of waste water involves the removal of:
(a) dissolved impurities (b) stable particles
(c) toxic substances (d) harmful bacteria

Q47. Solar System is in _____ galaxy.
(a) Milky Way (b) Andromeda
(c) Proxima Centauri (d) None of the above

Q48. The clinical test that is used for diagnosis of typhoid is:
(a) ELISA (b) ESR
(c) PCR (d) Widal

Q49. The maximum load a wire can withstand without breaking, when its length is reduced to half of its original length, will
(a) be double. (b) be half.
(c) be four times. (d) remain same.

Q50. Which condition out of the following will increase the evaporation of water?
(a) Increase in temperature of water
(b) Decrease in temperature of water
(c) Less exposed surface area of water
(d) Adding common salt to water

Q51. Rohan's father experienced a heart attack. Doctor told him that his blood vessels have become narrower. What could be the reason for this?
(a) His diet has an excess of roughage and water.
(b) His diet lacks proper amount of vitamins and minerals.
(c) His diet has an excess of fats and carbohydrates.
(d) His diet lacks proper amount of proteins and carbohydrates.

Q52. Ultrasound has frequency of vibration
(a) between 20 and 20,000 Hz
(b) below 20 Hz
(c) above 20,000 Hz
(d) between 500 and 10,000 Hz

Q53. Cork cells are made impervious to water and gases by the presence of
(a) cellulose (b) lipids
(c) suberin (d) lignin

Q54. Ice is floating on water in a beaker when ice completely melts then level of water in beaker:
(a) Increases (b) Remains the same
(c) Decreases (d) First increases then decreases

Q55. Pick one material from the following which is completely soluble in water.
(a) Chalk powder (b) Tea leaves
(c) Glucose (d) Saw dust

Q56. Transpiration is a process in which plants
(a) receive water from soil.
(b) absorb water vapour from air.
(c) prepare food from water.
(d) release water vapour.

Q57. The earth is an approximate sphere. If the interior contained matter which is not of the me density everywhere, then on the surface of the earth, the acceleration due to gravity
(a) will be directed towards the centre but not the same everywhere.
(b) will have the same value everywhere but not directed towards the centre.
(c) will be same everywhere in magnitude directed towards the centre.
(d) cannot be zero at any point.

Q58. All genes located on the same chromosome:
(a) Form different groups depending upon their relative distance
(b) Form one linkage group
(c) Will not from any linkage groups
(d) Form interactive groups that affect the phenotype

Q59. Neutral insulator P is rubbed with neutral insulator Q. Insulator P becomes positively charged after the rub. Which of the following statements is correct?
(a) P loses some electrons to insulator Q.
(b) Q loses some electrons to insulator P.
(c) P gains positive charge from insulator Q.
(d) Q gains positive charge from insulator P.

Q60. Rusting of an article made up of iron is called
(a) corrosion and it is a physical as well as chemical change
(b) dissolution and it is a physical change
(c) corrosion and it is a chemical change
(d) dissolution and it is a chemical change

Section-B (40 Marks)
(Physical Sciences)
(Descriptive type)

Note- Question numbers 1 to 5 carry 2 marks each. Question numbers 6 to 10 carry 4 marks each. Question 11 having two parts carries 5 marks each.

Q1. Out in deep space, far from any celestial object that exerts significant gravity, would an astronaut weigh anything? Would that astronaut have a mass?

Q2. As air rushes steadily into the narrow opening of a vacuum cleaner attachment, it accelerates to high speed and its pressure drops well below atmospheric pressure. From where does the air's new found kinetic energy come?

Q3. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify you answer.

Q4. You are given two samples of water labelled as 'A' and 'B'. Sample 'A' boils at 100°C and sample 'B' boils at 102°C. Which sample of water will not freeze at 0°C? Comment.

Q5. As two independent nitrogen atoms collide with one another, what forces do they experience and why?

Q6. Why does a metal bar appear hotter than a wooden bar at the same temperature? Equivalently it also appears cooler than wooden bar if they are both colder than room temperature.

Q7. Two bodies of unequal mass are moving in the same direction with equal kinetic energy. The two bodies are brought to rest by applying retarding force of same magnitude. How would the distance moved by them before coming to rest? Compare?

Q8. You're planning to construct a bungee-jumping amusement at the local shopping center. If you want your customers to have a 5 second free-fall experience, how tall will you need to build the tower from which they will jump? Explain your answer mathematically.

Q9. When 500 mL of water and 500 mL of ethanol are mixed the resulting volume is less than 1 L. How?

Q10. A student sitting at the back of the classroom cannot read clearly the letters written on the blackboard. What advice will a doctor give to her? Draw ray diagram for the correction of this defect.

Q11. Write short notes on **any two** of the following:

(a) Black holes and the Milky Way's darkest secret
(b) Green Chemistry
(c) NMR Imaging
(d) Indian heritage in Science & Technology
(e) Nanomaterials

Section-B (40 Marks)
(Life Sciences)

(Descriptive type)

Note- Question numbers 1 to 5 carry 2 marks each. Question numbers 6 to 10 carry 4 marks each. Question 11 having two parts carries 5 marks each.

Q1. Name a human disease, its causal organism, symptoms (any three) and vector, spread by intake of water and food contaminated by human faecal matter.

Q2. How does the study of fossils support evolution? Explain.

Q3. What is mitochodrail DNA and explain its significance in genetics.

Q4. 'Bryophytes are referred to as amphibians of plant kingdom'. Justify.

Q5. Explain the mechanism of blood-clotting.

Q6. Explain the process of conduction of nerve impulse.

Q7. Name the two cells of Islets of Langerhans that secrete hormones. Name the hormones. Explain their role in maintaining sugar level in blood.

Q8. Discuss the Central dogma? Who proposed it?

Q9. Describe the different steps in one complete cycle of PCR.

Q10. Why are thalassemia and haemophilia categorized as Mendelian disorders? Write the symptoms of these diseases. Explain their pattern of inheritance in humans.

Write short notes on **any two** of the following:

(a) Climate change & Global warming
(b) New Age Vaccines
(c) Zoonotic Diseases – a global threat to human health
(d) CRISPR-CAS. Advantages and Disadvantages
(e) CAR-T Cell Therapy – A new tool for cancer treatment