

IIT / NEET CUMULATIVE TEST - 2 (Foundation)

Class: Class 9

Duration: 90 Min

Date: 23-09-2025

MATHS, PHYSICS, CHEMISTRY, BIOLOGY - (On the syllabus of Foundation Test 5 to 8)

IITFoundationMaths

- 1) If $\cot \theta = 0$, then the value of θ is
 A) 0° B) 90° C) 180° D) 270°
- 2) $\cos(90^\circ + \theta) =$
 A) $\sin \theta$ B) $-\sin \theta$ C) $-\cos \theta$ D) $\cos \theta$
- 3) $\sin x = \cos x$
 A) $x = 0^\circ$ B) $x = 30^\circ$ C) $x = 45^\circ$ D) $x = 60^\circ$
- 4) Statement I : $\operatorname{cosec} \theta = \frac{1}{\sin \theta}$ and is undefined when $\theta = 0^\circ$.
 Statement II : $\sin 0^\circ = 1$
 A) Both Statement I and Statement II are True.
 B) Both Statement I and Statement II are False.
 C) Statement I is True, but Statement II is False.
 D) Statement I is False, but Statement II is True.
- 5) if $\tan \theta = \sqrt{3}$, then the value of $\frac{1 - \cos^2 \theta}{2 - \sin^2 \theta}$ is
 A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{2}{5}$ D) $\frac{5}{2}$
- 6) if $\sin(\alpha + \beta) = 1$ and $\cos(\alpha - \beta) = \frac{\sqrt{3}}{2}$, $0^\circ < \alpha + \beta \leq 90^\circ$ and $\alpha > \beta$, then $\alpha =$
 A) 90° B) 60° C) 45° D) 30°
- 7) The number of roots of the equation $2\sin^2 \theta + 3\sin \theta + 1 = 0$ in $(0, 2\pi)$ are
 A) 1 B) 2 C) 3 D) 4
- 8) The principal solution of $\sin \theta = 1$ is
 A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) π
- 9) If $(1 + \tan \alpha)(1 + \tan 4\alpha) = 2$, $\alpha \in (0, \frac{\pi}{16})$, then $\alpha =$
 A) $\frac{\pi}{20}$ B) $\frac{\pi}{30}$ C) $\frac{\pi}{40}$ D) $\frac{\pi}{60}$
- 10) If a Tower is 100 meters height, then the angle of elevation of its top from a point 100 mts away from its foot is
 A) 30° B) 60° C) 45° D) 90°
- 11) Statement I : The angle of depression to an object decreases as the object moves closer to the tower.
 Statement II : Tangent of an angle decreases as the angle increases.
 A) Both statements are True.
 B) Both statements are False.
 C) Statement I is True, but Statement II is False.
 D) Statement I is False, but Statement II is True.
- 12) The angle which is equal to its supplement is ?
 A) 90° B) 180° C) 120° D) 75°
- 13) If $\angle P = (x + 40)^\circ$ and $\angle Q = (3x - 20)^\circ$ are alternate interior angles, then $x =$
 A) 30° B) 20° C) 25° D) 40°
- 14) In triangle ABC, D and E divide sides AB and AC such that $AD:DB = 2:3$. If $DE \parallel BC$, then $AE:EC =$
 A) 3:2 B) 2:3 C) 1:3 D) 1:2
- 15) Which of the statement is false?
 A) A line is not parallel to itself
 B) Two line segments in a plane either intersect (or) are parallel
 C) If l is perpendicular to m and m is perpendicular to n then l is parallel to n.
 D) Angle between two parallel lines is a zero angle.

IITFoundationPhysics

- 16) A 1HP motor Pumps out water from a well of depth 20m and fills a water tank of volume 2238 lit at a height of 10m from the ground. The running time of motor to fill the empty waker tank is.
- A) 5 min B) 10 min C) 15min D) 20 min
- 17) Which of the following are correct?
- a)1 horse power = 746 W b)1 horse power = 546 W
c)1 horse power =550 foot - pounds/sec d)1 horse power =500 foot - pound/s
- A) a,b are corect B) a,c are correct
C) b,d are correct D) c,d are correct
- 18) A man is riding on a cycle with velocity 7.2 kmph up a hill having a slope 1 in 20. Total mass of the man and the cycle is 100kg.The Power of a man is
- A) 98 W B) 49 W C) 96 W D) 147kW
- 19) An engine develops 10 kW of power.How much time wil it take to lift a mass of 200 kg to a height of 40 m ($g = 10 \text{ m/s}^2$)
- A) 9s B) 4s C) 8s D) 7s
- 20) Two boides of masses 1kg each are separated by a distance 1m,then the Force of attraction between them is
- A) GN B) 3GN C) G/2N D) 4GN
- 21) Suppose universal gravitational constant starts to decrease then
- a)length of the year will increase
b)earth will follow a spiral path of decreasing radius
c)kinetic energy of earth will decrease
- A) a&b are true B) a&c are true
C) b&c are true D) all are correct
- 22) A:'g' is maximum at the poles and minimum at the equator
R:'g' varies with rotation of earth
- A) If both Assertion and Reason are true and the Reason is correct explanation of the Assertion
B) If both Assertion and Reason are true ,but Reason is not correct explanation of the Assertion
C) If Assertion is true ,but the Reason is false.
D) If Assertion is false,but the Reason is true.
- 23) The gravitational force of attraction between two bodies is F_1 .If the mass of each body is doubled and the distance between them is halved,then the gravitational force between them is F_2 .then
- A) $F_1=F_2$ B) $F_1=4F_2$
C) $F_1=8 F_2$ D) $F_2 =16 F_1$
- 24) A:When bubble comes from the bottom of a lake to the top Its radius increases
R:When bubble rises to top of a lake pressure decreases
- A) Both A and R are true and R is correct explanation of A
B) Both A and R are true and R is not correct explanation of A
C) A is true R is false
D) A and R are false
- 25) A:It is difficult for a man to walk on sand.But camel walks easily on sand.
R:Camels feet have larger area than feet of man hence pressure is less
- A) Both A and R are true and R is correct explanation of A
B) Both A and R are true and R is not correct explanation of A
C) A is true R is false
D) A and R are false
- 26) If weight of the body in water (w_2) is 1/5th of its weight in air ,then apparent loss of weight of the body after immersed in water completely is
- A) $\frac{1}{3}w_1$ B) $\frac{2}{3} w_2$ C) $(4/5)w_1$ D) w_1
- 27) How high would water rise in the pipes of a building of the water pressure gauge,shows the pressure at ground floor to be 100k Pa
- A) 10m B) 25.55m C) 37.55m D) 47.55m
- 28) If an object is placed 10 cm in front of a convex mirror of focal length 20 cm, then distance of the image from the mirror is
- A) 10/3 cm B) 20/3 cm C) 10 cm D) 40/3 cm
- 29) A real image formed by a concave mirror is 4.5 times the size of the object. If the mirror is 20 cm from the object, its focal length is
- A) 90/11 cm B) 120/11 cm C) 150/11 cm D) 180/11 cm
- 30) An object placed infront of concave mirror of focal length 15 cm, produces a virtual image, which is twice the size of the object. The position of the object is
- A) -5.5 cm B) -6.5 cm C) -7.5 cm D) -8.5 cm

- 31) The element having highest electron affinity is
 A) Fluorine B) Nitrogen C) Chlorine D) Oxygen
- 32) Electronegativity is a measure of the capacity of an atom to
 A) Attract electrons B) Attract protons
 C) Repel electrons D) repel protons
- 33) If the electronegativity difference between bonded atoms is exactly 1.7 the nature of bond formed is
 A) >50% Ionic B) <50% Ionic
 C) 50% Ionic & 50% covalent D) 100% Ionic
- 34) The reference element in Paulings scale of Electronegativity is
 A) H B) O C) N D) Cl
- 35) In a crystal cations and anions are held together by
 A) Electrons B) Electrostatic forces
 C) Nuclear forces D) Nuclear forces
- 36) Potassium forms a highly ionic compound when it combines with
 A) Chlorine B) Fluorine C) Bromine D) Iodine
- 37) During bond formation potential energy of the system
 A) Increases B) decreases
 C) remains the same D) cannot be predicted
- 38) Least ionic compound among the following is
 A) NaCl B) KCl C) CsI D) LiI
- 39) Compound having maximum number of bonded pairs of electrons in its molecule is
 A) Ethane B) Ammonia
 C) Sulphur hexafluoride D) Bromine Pentafluoride
- 40) Which of the following is a highly polar molecule
 A) HCl B) HF C) H₂S D) NH₃
- 41) The compound having least covalent nature is
 A) AlCl₃ B) MgCl₂ C) NaCl D) KCl
- 42) In the formation of covalent bond
 A) transfer of electrons take place B) electrons are gained by only one atom
 C) sharing of electrons take place D) gaining of electrons take place
- 43) Identify the amphoteric species from the following :
 (I) H₂O (II) NH₃ (III) H₂PO₄⁻ (IV) HCO₃⁻
 A) I, II B) III, IV C) I, II, III D) I, II, III, IV
- 44) Conjugate base of hydrozoic acid is
 A) N₂H₄ B) N₂H₅⁺ C) N₃⁻ D) NH₂OH
- 45) Which of the following cannot act as a Lewis or Bronsted acid
 A) BF₃ B) AlCl₃ C) SnCl₄ D) CCl₄

TSINTEGRATEDBIOLOGY

- 46) What is the role of sclerenchyma fibres in water transport?
 A) They help in the conduction of water through the xylem.
 B) They store water in plant tissues.
 C) They form the vessel elements for water flow.
 D) They help to filter water in plant roots.
- 47) Which of the following cells in xylem helps in the lateral conduction of water?
 A) Xylem parenchyma B) Xylem fibres C) Tracheids D) Vessels
- 48) Where are xylem and phloem usually found together in plants?
 A) Only in roots
 B) Only in stems
 C) In vascular bundles in roots, stems, and leaves
 D) Only in leaves
- 49) What is the main difference between tracheids and vessels in xylem?
 A) Tracheids are non-living, while vessels are living
 B) Tracheids have a larger lumen than vessels
 C) Vessels have no lignified walls
 D) Vessels are more efficient in conduction than tracheids
- 50) Xylem is commonly known as
 A) Leaf B) Stem C) Wood D) Root

51) which regulates carbondioxide transport in Red blood corpuscles

- A) Oxy anhydrase B) carbonic anhydrase C) carboxy anhydrase D) carboanhydrase

52) Cells of the cartilage embedded in the matrix in groups of two, four, or more in fluid filled spaces called

- A) perichondrium B) lacunae C) chondroblasts D) All the above

53) Cartilage is usually covered by a tough fibrous membrane called

- A) chondroblasts B) lacunae C) perichondrium D) fibroblasts

54) nissal granules are groups of

- A) ribosomes and rough endoplasmic reticulum
B) mitochondria and rough endoplasmic reticulum
C) ribosomes and mitochondria
D) Smooth and rough endoplasmic reticulum

55) The dentrites conduct the impulse to the

- A) Cyton B) Axon C) axolemma D) axoplasm

56) Striated Muscles are present in

- A) tongue B) pharynx
C) beginning of oesophagus D) All the above

57) Assertion: Osmosis is essential for maintaining the structural integrity of plant cells.

Reason: It regulates the movement of water into the cell vacuoles, maintaining turgor pressure.

- A) Both Assertion and Reason are correct and Reason is correct explanation of Assertion.
B) Both Assertion and reason are correct and Reason is not correct explanation of Assertion.
C) Assertion is true and Reason is false.
D) Assertion is false and Reason is true.

58) Which process describes the movement of water from a region of low solute concentration to high solute concentration?

- A) Endosmosis B) Exosmosis C) Osmosis D) Diffusion

59) What is the primary role of the plasma membrane in cells?

- A) Energy production B) Protection
C) Recognition D) Selective material passage

60) What process allows cells to engulf substances from their external environment?

- A) Osmosis B) Diffusion C) Recognition D) Endocytosis

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