

### **ACADEMIC SESSION 2025**

#### Name :

**Application No.:** 

# **RNTSE : 2025**

**Resonance Nashik Talent Search Exam** 



#### Duration : 90 Min.

Max. Marks: 210

Pattern : Single Option Correct (+3, -1) Total No. of Questions 70 ( Physics : 15, Chemistry : 15, Mathematics : 25, Biology : 15)



**PHYSICS :** Kinematics : Rectilinear motion, Velocity, Speed, Acceleration. Motion under gravity. Newton's law of motion, Forces, Work done by force, Energy, Power, Sound wave.

**CHEMISTRY :** Classification of Matter, State of Matter, Evaporation, Types of Solution, Separation Techniques, Physical and Chemical Changes

**MATHEMATICS :** Number system, Polynomials, Coordinate geometry, Lines and angles Congruent triangles, Linear equations in two variables

BIOLOGY : Fundamental unit of life / Cell, Animal tissue, Plant tissue, Plant Diversity / Classification

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AIR 325



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**SMERA PANDA** 

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**SIDDHI BORASE AIR 2688** 



**MANDAR DESHMUKH** 

AIR 279

**PRATHMESH MAHAJAN** 

AIR 2748



**SOHAM DOKHALE AIR 665** 

AAYUSH VANMALI

**AIR 2937** 



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**SHAUNAK DAHIBATE** 

**AIR 4472** 

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#### Section-I(Physics)

1. The velocity-time graph of a SUV is given below. The mass of the SUV is 1500 kg. What is the distance travelled by the SUV in the first 5 seconds ?



2.If the momentum of a moving body increased by 50% then the kinetic energy will be increased by<br/>(A) 100%(B) 125%(C) 150%(D) 200%

3. Two bodies of masses m and 3m, moving with velocities 3v and v respectively along same direction, collide with each other. After collision they stick together and moves with velocity 'V' in the same direction Then. (A) V = v (B)  $V = \frac{3}{2}v$  (C) V = 2v (D)  $V = \frac{4}{3}v$ 

4. A block is placed on a rough horizontal surface. A time dependent horizontal force F = kt acts on the block, where K is positive constant and t is time. Acceleration time graph of the block is



5. A truck and a car moving with same kinetic energy. They are brought to rest by the application of brakes which provide equal frictional force

(A)Both will cover equal distance

(B) The truck will cover greater distance

(C) The car will cover a greater distance

(D) None of the above

6. A body of mass 'm' kg initially at rest attains a velocity of 'v' m/sec in time 't' under the action of a constant force F. The average power supplied to the mass is :

(A) 
$$\frac{mv}{t}$$
 (B)  $\frac{mv^2}{t}$  (C)  $F.v$  (D)  $\frac{Fv}{2}$ 

7. There are three blocks A,B & C of masses 2kg 3kg & 4 kg respectively, placed on smooth horizontal surface as shown. Now Two forces  $F_1 = 8 \text{ N}$ ,  $F_2 = 35 \text{ N}$  are applied in the direction shown Find normal force applied by B on A.

8. An object of mass 10 kg falls from height 10 m. kinetic energy gained by the body will be approximately equal to.
(A) 1000 J
(B) 500 J
(C) 100 J
(D) None of these



**RNTSE** sample paper

14.

Class IX

- 9. The density of medium through which longitudinal waves propagates is minimum in a region which is called
   (A) Crest
   (B) Compression
   (C) Trough
   (D) Rarefaction
- 10. An echo is heard in 3 sec. What is the distance of the reflecting surface form the source, given that the speed of sound is 342 ms<sup>-1</sup>?
- (A) 1026 m (B) 513 m (C) 342 m (D) None of these
   11. Which of the following graphs best represents graphical relation between momentum P and kinetic energy K for a body in motion ?



- 12. A girl is carrying a school bag of 3 kg mass on her back and moves 200 m on a levelled road. The work done against the gravitational force will be  $(g = 10 ms^{-2})$ (A) 6 x 10<sup>3</sup> J (B) 6 J (C) 0.6 J (D) Zero
- 13. A car running with a velocity of 30 m/s reaches midway between two vertical parallel walls separated by 360 m, when the driver sounds the horn for a moment. Speed of sound in air is 330 m/s. After blowing horn, the first three echoes will be heard by the driver respectively at \_\_\_\_\_.

(A) 1.2 s, 2.4 s, 3.0	) s	(B) 1.0 s, 1.2 s, 2.0 s		
(C) 1.0 s, 2.0 s, 3.0	) s	(D) 1.2 s, 2.4 s, 3.6 s		
Two sound waves in air have wavelengths differing by 2 m at a certain temperature T.				
Their notes have musical interval 1.4. Period of the lower pitch note is 20 ms. Then, speed				
of sound in air at this temperature (T) is				
(A) 350 m/s	(B) 342 m/s	(C) 250 m/s	(D) 330 m/s	

15. A mass of 0.5 kg moving with a speed of 1.5 m/s on a horizontal smooth surface, collides with a nearly weightless spring of force constant K = 50 N/m. The maximum compression of the spring would be (A) 0.15 m (B) 0.12 m (C) 0.5 m (D) 0.25 m

	Section-II (Chemistry)					
16.	Which one of the follo $(A)$ Digestion of food	wing is a physical change	e? (P) Making a sup of too			
	(C) Boiling of an egg.		(D) None of these			
17.	Mixture of ammonium	Mixture of ammonium chloride and sodium chloride can be separated by				
	(A) Chromatography	(B) Hand picking	(C) By sublimation	(D) Centrifugation		
18.	Purity of organic liquid can be checked by its characteristic					
	(A) Volume	(B) Solubility in water	(C) Boiling point	(D) Solubility in alcohol		
19.	When the solid melts,	its temperature				
	(A) Increases	-	(B) Decreases			
	(C) Remain constant		(D) First increases then decreases	se		
20.	When common salt is a	added in ice				
	(A) It's melting point of	lecreases	(B) It's melting point increases			
	(C) It's melting point d	loes not change from 0°C	(D) Ice becomes harder			



#### **RNTSE** sample paper

- 21. **Statement I :** Solids have definite shape and volume.
  - Statement II : They have strong intermolecular force of attraction.
  - (A) Both statement I and II are correct.
  - (B) Both statement I and II are incorrect.
  - (C) Statement I is correct and statement II is incorrect.
  - (D) Statement I is incorrect and statement II is correct.
- 22. Match the column-I with column-II and select the correct option from the codes given below : i. Highly compressible a. Liquid b. Gas ii. Definite volume c. Plasma iii. Super low density d. Bose-Einstein condensate iv. Super energetic (A) a-i, b-ii, c-iii, d-iv (B) a-ii, b-i, c-iii, d-iv (C) a-ii, b-i, c-iv, d-iii (D) a-iii, b-i, c-ii, d-iv 23. Fog is an example of (A) Foam (B) Emulsion (C) Aerosol (D) Gel Which of the following substance when mixed with sand cannot be separated by sublimation ? 24.  $(B) NH_4Cl$ (C) Camphor (A) NaCl (D) Iodine Three substances have the following properties : 25. (i) Substance 1 is brittle (ii) substance 2 melts at 5°C and boils at 150°C (iii) substance 3 has a high melting point of 800°C What is the physical state of each substance at room temperature and pressure? Substance 1, Substance 2, Substance 3 (A) Gas, liquid, solid (B) Solid, gas, solid (C) Solid, liquid, solid (D) Solid, gas, liquid 26. Carbon burns in presence of oxygen to form carbon dioxide. The properties of carbon dioxide are (A)Similar to carbon (B) Similar to oxygen (C) Totally different from both carbon and oxygen (D) Much similar to both carbon and oxygen A thermometer is inserted into a beaker filled with ice at 0°C and beaker is heated slowly. The temperature 27. does not rise for some time, due to which of the following? (A) Ice is very cold (B) Heat was used for changing ice at 0°C to water at 0°C (C) The density of water is more than ice (D) The density of water is more than ice 28. A form of matter has no fixed shape and no fixed volume, an example of this form of matter is-(C) Krypton (A) Petrol (B) Iron (D) Carbon steel 29. The amount of glucose required to prepare a 300 gm of 5% solution of glucose by mass is-(A)12.5g (B) 15g (C) 17g (D) 20g 30. At what temperature, the Celsius and Fahrenheit scales will read the same?  $(A) - 10^{\circ}C$ (B)  $40^{\circ}$ C  $(C) - 40^{\circ}C$ (D) 32°C

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#### Section-III (Math)

- 31. If  $a^* = a + 1$ , \*a = a 1, then  $1^* *1 + 2^* *2 + 3^* *3 + ... + 1000^* *1000$  is equal to (A) 1000 (B) - 1000 (C) 2000 (D) - 2000
- 32. In the figure follow, CD || AB calculate  $\angle y$ .



- 34. If a + 2a + 3a + ... + 1000a = 2b + 4b + 6b + ... + 2000b = 3c + 6c + 9c + ... + 3000c, then a : b : c is (A) 1 : 2 : 3 (B) 3 : 2 : 1 (C) 2 : 3 : 6 (D) 6 : 3 : 2
- 35. In the adjoining figure, BCD is the diameter of the semicircle with centre C. FE is the tangent at F then consider following statements.



39. If x + y = 17 and  $x^2 + y^2 = 167$ , then what is the value of 2x (1 + y) + y(2 + x)(A)  $17 + 4\sqrt{114}$  (B) 217 (C)  $48 + \sqrt{167}$  (D) 122



**RNTSE** sample naper

Class IX

RNI	SE sample pap	Der		Class IX
40.	The rationalizing	g factor of $\sqrt[n]{\frac{a}{b}}$ is		
	(A) $ab \sqrt[n]{\frac{a}{b}}$	(B) $\sqrt[n]{\frac{a}{b}}$	(C) $\sqrt[n]{\frac{a^{n-1}}{b^{n-1}}}$	(D) $\sqrt[n]{\frac{a^{n+1}}{b^{n+1}}}$
41.	A triangle with in	ntegral sides has perimet	er 8 units. The area of the tri	angle is sq. units.
	(A) 2	(B) $2\sqrt{2}$	(C) $3\sqrt{2}$	(D) 4
42.	If the altitudes of (A) 6 : 4 : 3	a triangle are in the ratio (B) 2 : 4 : 3	0 2 : 3 : 4, then the lengths of (C) 3 : 2 : 4	f the corresponding sides are in ratio. (D) 3 : 2 : 1
43.	If $x = \sqrt{27x + 2}$	$(2y)$ and $y = \sqrt{(27y + 2x)}$	$\overline{x}$ also $x \neq y$ the find the ve	alue of $\sqrt{(x^2 + y^2 + 116)}$
	(A) 24	(B) 28	(C) 27	(D) 29
44.	Given x + 3y = 1 (A) 100	00, where x and y are po (B) 97	ositive integers. The number (C) 33	of pairs satisfying the above equation (D) 34
45.	A cubic polynom (A) 16	hial P is such that $P(1) =$ (B) 10	1, P(2) = 2, P(3) = 3 and P(4 (C) 13	) = 5.Then P(6) is (D) 7
46.	If $\frac{97}{19} = w + \frac{1}{x + \frac{1}{2}}$	$\frac{1}{\sqrt{1}}}}}}}}}}$	gers then $(w + x + y)$ equals :	
	(A) 19	(B) 17	(C) 18	(D) 16
47.	In a plane, three the circle are cou	lines and a circle are given inted. The maximum nur	en. If the points of intersection nber of points of intersection	on of two lines or that of a line with possible in this is
	(A) 12	(B) 9	(C) 6	(D) 5
48.	In the figure sho	wn, PQ    RS and SM    T ' \	N then measure of angle $\alpha$ is	:
		R	S 62 <sup>0</sup> 0	
	(A) $58^{\circ}$	(B) $118^{\circ}$	т (С) 89 <sup>0</sup>	(D) $91^0$
49.	The digit at the 1	00 <sup>th</sup> place in the decimal	representation of $\frac{6}{2}$ is	
	(A) 1	(B) 2	(C) 4	(D) 5
50				

- The value of  $\sqrt{3} 2\sqrt{2}$  is 50. (B)  $\sqrt{2} + 1$  (C)  $\sqrt{3} - \sqrt{2}$ (A)  $\sqrt{2} - 1$ (D)  $\sqrt{3} + \sqrt{2}$
- If the LCM of a and 18 is 36 and HCF of a and 18 is 2, then a =51. (A) 2 (B) 3 (C) 4 (D) 1
- The zeros of the polynomial  $f(x) = 3x^2 x 4$  are (A)  $-\frac{4}{3}, \frac{-4}{3}$  (B)  $\frac{4}{3}, -1$  (C)  $\frac{-4}{3}, \frac{4}{3}$ 52.  $(D)\frac{-4}{3}, -1$

**RNTSE** sample paper

In  $\Delta$  ABC shown below, point D,E & F are mid points of sides BC, BD & AE respectively then 53. area of ( $\Delta$  BFE) is equal to



- 54. The sum of the present ages of father and his son is 60 years. 6 years ago, father's age was five times the age of the son. After six years son's age will be : (A) 20 years (B) 14 years (C) 12 years (D) 18 years
- 55. In given figure AB || CD,  $\angle ABE = 120^{\circ} \angle DCE = 110^{\circ}$  and BEC = x° will be



#### Section-IV (Biology)

56. Trees of the genus Pinus are placed in higher groups compared to those of Marsilea genus because of the presence of one of the following features. (A) Differentiated plant body (B) Presence of seed (C) Presence of conducting tissue (D) Presence of flowers

- 57. What will happen to cells of cyanobacteria if they are placed in purified water? (A) They will swell and burst (B) They will shrink (C) They will swell but will not burst (D) They will not show any change
- 58. A previously unknown organism that lacks both a nuclear membrane and mitochondria has just been discovered. Which of the following would this organism most likely possess? (A) Lysosomes (B) Cilia
  - (C) Endoplasmic reticulum
- (D) Ribosomes
- 59. Which of the following is most likely to show aerenchyma? (A) Leaf base of mango (B) Petiole of water hyacinth
  - (C) Seta of moss

 $(A) 60^{\circ}$ 

(D) Stem of Opuntia

(B) Areolar connective tissue

(D) Exocrine glands

- 60. Mast cells are linked to
  - (A) Neural tissue
  - (C) Endocrine glands
- 61. Which does not describe monocots?
  - (A) Parallel venation
  - (B) Fibrous root
  - (C) Flowers with 4 or 5 parts or in their multiples
  - (D) Vascular bundles scattered



- 62. Phragmoplast is
  - (A) Cell plate formed by products of dictyosome during cytokinesis

(B) Cell membrane formed by endoplasmic reticulum, golgi bodies and secretory vesicles during cytokinesis

- (C) Plastid capable of fragmentation
- (D) Plastid capable of duplication
- 63. Bryophytes include
  - (A) Liverworts and funaria
  - (C) Selaginella& Horsetail

(B) Mosses and ferns

- (D) Liverworts and stoneworts
- 64. Sclerenchyma in plants is an example of simple permanent tissue comprising of two types of cells, sclereids and fibres. Why these cells are functionally important to the plants even after they die? Choose the correct alternative from the options given below.
  - (A) Both are thin walled cells lacking intercellular spaces.
  - (B) Walls in both the types of cells are thick and cutinized.
  - (C) Walls in both the cell types are thick and usually lignified.
  - (D) Both the cells are used for conducting solutes and providing strength to the plant.
- 65. Read the following statements and select the correct one(s).
  - (i) In flowering plants, tracheids and vessels are the main water transporting elements.
  - (ii) The presence of vessels is a characteristic feature of angiosperms.
  - (iii) Xylem fibres have highly thinned walls and their cell walls are made up of cellulose.
  - (iv) Xylem parenchyma store food materials in the form of starch or fat and other substances like tannins. Which of the above statement(s) is/are correct?
  - (A) Only (i)(B) Both (ii) and (iii)(C) Both (iii) and (iv)(D) (i), (ii) and (iv)
- 66. According to widely accepted "fluid mosaic model" cell membranes are semi-fluid, where lipids and integral proteins can diffuse randomly. In recent years, this model has been modified in several respects. In this regard, which of the following statement is incorrect?
  - (A) Proteins in cell membranes can travel within the lipid bilayer.
  - (B) Proteins can also undergo flip-flop movements in the lipid bilayer.
  - (C) Proteins can remain confined within certain domains of the membrane.
  - (D) Many proteins remain completely embedded within the lipid bilayer.
- 67. Which of the following do not have specific parts like root, stem, leaves and flowers ? (A) Thallophyta(B) Gymnosperms (C) Angiosperm (D) Pteridophyta
- 68. Which of the following statement is not correct regarding neural tissue ?
  - (A) It exerts the greatest control over the body's responsiveness to changing conditions.
  - (B) Chondrocytes, the unit of neural system are excitable cells.
  - (C) Neuroglial cells protect and support neurons.
  - (D) When a neuron is suitably stimulated, an electrical disturbance is generated.
- 69. Read the following statements and answer the question :
  - (i) They have a hard and non-pliable ground substance rich in calcium salts and collagen fibres.
  - (ii) They support and protect softer tissues and organs.
  - (iii) Osteocytes are present in the spaces called lacunae.
  - (iv) They also interact with skeletal muscles attached to them to bring about movements.
  - Which of the following type of tissue is being described by above statements ?
  - (A) Cartilage (B) Bone (C) Blood (D) Neurons

70.	Which cell organelle is known as powerhouse of the cell :				
	(A) Ribosome	(B) Nucleolus	(C) Nucleus	(D) Mitochondria	



Answer key: Physics 4.C 6.D 7.B 9.D 1.B 2.B 3.B 5.A 8.A 10.B 11.D 12.D 13.B 14.A 15.A Answer key: Chemistry 16.D 17.C 18.C 19.C 20.A 21.A 22.C 23.C 24.A 25.C 26.A 27.A 28.A 29.C 30.A Answer key: Maths 32.C 33.C 34.D 35.C 36.B 37.B 38.B 39.B 40.C 41.B 42.A 43.D 31.C 45.A 46.D 47.B 49.A 50.A 51.C 44.C 48.C 52.B 53.D 54.A 55.B **Answer key: Biology** 57.C 58.D 59.B 60.B 61.C 62.A 63.A 64.C 65.D 56.B 66.B 67.A 68.B 69.B 70.D



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