

ENTRANCE TEST MODEL PAPER**MATHEMATICS**

1. If $2^x = 32$, then the value of x is

A) 3 B) 4 C) 5 D) 6

Unit: Number system

Topic: Laws of Exponents for real numbers

2. The degree of the polynomial $7x^4 + 5x^3 + 8x^2 + 7$ is

A) 2 B) 3 C) 4 D) 7

Unit: Polynomials

Topic: Basic concept

3. The order pair satisfies $2x + 3y = 12$ is

A) (4,2) B) (0,4) C) (1,5) D) (3,1)

Unit: Linear equation

Topic: Solution of linear equations

4. The discriminant of $x^2 - 6x + 9 = 0$ is

A) 36 B) 18 C) 9 D) 0

Unit: Quadratic equation

Topic: Nature of roots

5. The point which are 3 units left and 4 units above the origin is

A) (3,4) B) (-3,4) C) (4,3) D) (4,-3)

Unit: Co-ordinate Geometry

Topic: Cartesian plane

6. Two lines intersect at a point. If one of the angles is 72° , then vertically opposite angle is

A) 18° B) 72° C) 108° D) 180°

Unit: Triangle

Topic: Basic properties

7. In $\triangle ABC$ and $\triangle PQR$, $AB = PQ$, $BC = QR$, and $\angle B = \angle Q$. If $AC = 8\text{cm}$, then PR is

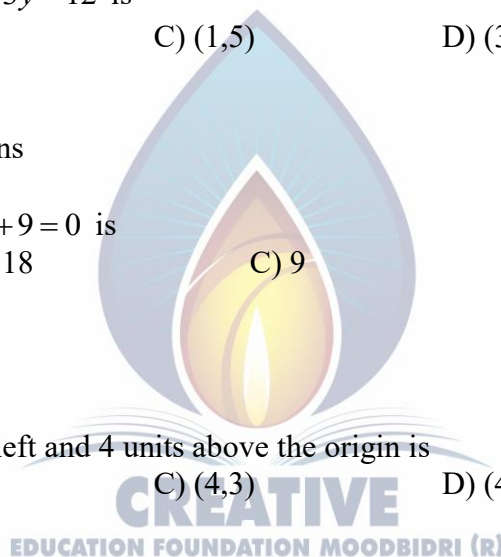
A) 6cm B) 7cm C) 8cm D) 10cm

Unit: Triangles

Topic: Congruence

8. The number which has exactly 3 distinct prime factors

A) 36 B) 42 C) 64 D) 81



Unit: Number system

Topic: Fundamental theorem of arithmetic

9. If the prime factorization of 756 is $2^a \times 3^b \times 7$, then a and b are

- A) $a = 1, b = 2$ B) $a = 2, b = 2$ C) $a = 2, b = 3$ D) $a = 3, b = 2$

Unit: Number of systems

Topic: Fundamental theorem of arithmetic

10. If $a + b = 9$ and $ab = 14$, then $a^2 + b^2$ is

- A) 53 B) 55 C) 67 D) 95

Unit: Linear equation

Topic: Basic concept

11. If one zero of the polynomials $x^2 - 6x + k$ is twice the other, then the value of k is

- A) 6 B) 8 C) 9 D) 12

Unit: Polynomials

Topic: Relationship between zeros and co-efficient

12. The pair of equations $2x + 3y = 7$ and $4x + 6y = 14$ represents

- A) Inconsistent system
B) consistent system with a unique solution
C) Consistent system with infinitely many solutions
D) No solutions

Unit: Linear equations

Topic: Consistent & Inconsistent systems

13. If α and β are zeroes of $x^2 - 5x + 6$, then the value of $\alpha^2 + \beta^2$ is

- A) 11 B) 13 C) 17 D) 25

Unit: Quadratic equations

Topic: Relationship between roots and coefficients

14. If the distance between $A(x, 2)$ and $B(3, 2)$ is 5, then x can be

- A) 8 only B) -2 only C) 8 or -2 D) 5 or -5

Unit: Co-ordinate geometry

Topic: Distance formula

15. Two parallel lines are cut by a transversal. If one interior angle is 110° , its co-interior angle is

- A) 70° B) 80° C) 110° D) 180°

Unit: Lines and angles

Topic: Parallel lines

16. If $\triangle ABC \cong \triangle PQR$, then which of the following is correct?

- A) $AB=QR$ B) $AC=PR$ C) $BC=PQ$ D) $\angle B = \angle P$

Unit: Triangles

Topic: Congruence

17. In $\triangle ABC$ and $\triangle PQR$ if $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR} = 2$, then

- A) Congruent B) Similar C) Right angled D) Isosceles

Unit: Triangles

Topic: Similarity & criterion of similarity of triangles

18. If a point lies on the x-axis which of the following can be its coordinates?

- A) $(0, -5)$ B) $(3, 0)$ C) $(0, 7)$ D) $(2, 4)$

Unit: Coordinate geometry

Topic: Cartesian plane

19. For $p(x) = x^3 - 3x^2 - 4x + 12$, which statement is correct?

- A) $x+3$ is not a factor B) $x+2$ is a factor
C) $x-4$ is not a factor D) $x-5$ is a factor

Unit: Polynomials

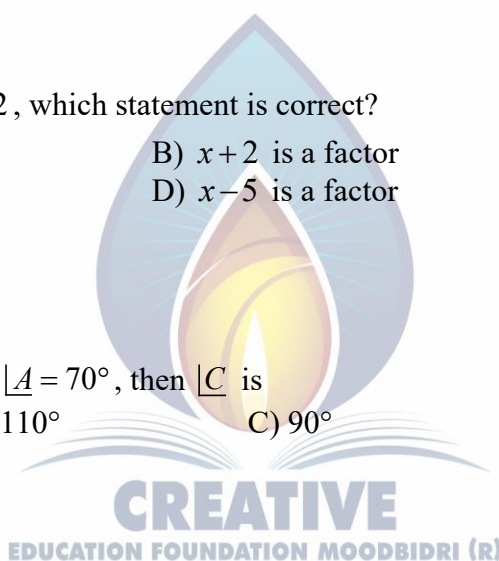
Topic: Factor theorem

20. In a parallelogram ABCD if $\angle A = 70^\circ$, then $\angle C$ is

- A) 70° B) 110° C) 90° D) 140°

Unit: Quadrilateral

Topic: Properties



PHYSICS

21. The sound of thunder is heard approximately 6s after the flash of lightening is seen. If speed of sound in air is 346 m/s, then distance of point from the lightning is

- A) 1200 m B) 2076 m C) 3460 m D) 965 m

Unit: Motion

Topic: Average speed

22. A force of 20 N acts on an object of mass 4 kg. The acceleration produced is

- A) 80 m/s^2 B) 5 m/s^2 C) 0.2 m/s^2 D) 24 m/s^2

Unit: Forces

Topic: Newton's second law

23. If the velocity of a body is doubled, its kinetic energy:

- A) Becomes 4 times B) Becomes 2 times
C) Becomes 3 times D) Remains the same

Unit: Work, Energy and Power

Topic: Kinetic energy

24. Match the following

Column I	Column II
(1) Frequency	(a) Number of vibrations per second
(2) Amplitude	(b) Loudness of sound
(3) Wavelength	(c) Distance between two successive compressions

A) 1 – a, 2 – b, 3 – c

B) 1 – a, 2 – c, 3 – b

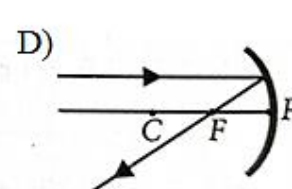
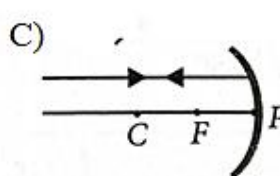
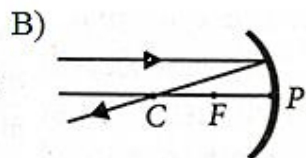
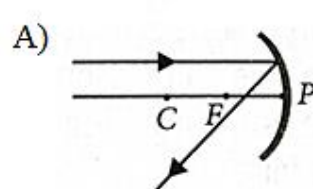
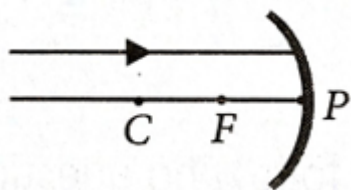
C) 1 – b, 2 – a, 3 – c

D) 1 – c, 2 – b, 3 – a

Unit: Sound

Topic: Amplitude, wavelength and frequency of sound

25. Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in figure?



Unit: Light and optics

Topic: Image formation by convex and concave mirror.

26. A body moving along a straight line at 10 m/s undergoes an acceleration of 2 m/s^2 . After 2s, its speed will be

A) – 8 m/s

B) 12 m/s

C) 14 m/s

D) 16 m/s

Unit: Motion

Topic: Kinematic equations

27. Assertion (A): If two persons walking or running in opposite direction collide with each other, then both feel hurt.

Reason (R): To every action, there is an equal and opposite reaction.

A) If both assertion and reason are true and reason is the correct explanation of assertion.

B) If both assertion and reason are true but reason is not the correct explanation of assertion.

C) If assertion is true but reason is false.

D) If assertion is false but reason is true.

Unit: Forces

Topic: Newton's third law

28. If 10 N of force is applied to an object, but the object does not move, then how much work being done by the force?

- A) Zero B) 10 J C) 10 N D) 20 J

Unit: Work, Energy and Power

Topic: Work done by constant force.

29. A sound wave has frequency 2000 Hz and wavelength of 0.15 m. What is the speed of wave?

- A) 300 m/s B) 150 m/s C) 30 m/s D) 3000 m/s

Unit: Sound

Topic: Velocity of sound

30. To form an image twice the size of the object, using a convex lens of focal length 20 cm, the object distance must be

- A) < 20 cm
B) > 20 cm
C) < 20 cm and between 20 cm and 40 cm
D) Cannot say

Unit: Light and optics.

Topic: Image formation by lens.

CHEMISTRY

31. Identify the correct statement from the following

- i) A solution is homogeneous mixture of two or more substances
ii) Brass is a mixture of approximately 30% Zinc and 70% Tin
iii) The component of the solution that present in larger amount is called solvent.
iv) Air is a heterogeneous mixture of number of gases.

- A) i and ii B) i, ii and iii C) ii and iv D) i and iii

32. Match the column I (Orbit Number) with column II (Shell representation).

Orbit number	Shell Representation
a) 3	i) K
b) 2	ii) N
c) 4	iii) M
d) 1	iv) L

- A) a-i, b-ii, c-iii, d-iv B) a-iii, b-iv, c-ii, d-i
C) a-ii, b-iii, c-i, d-iv D) a-vi, b-iii, c-ii, d-i

33. Number of neutrons present in tritium is

- A) 1 B) 0 C) 2 D) 3

34. The chemical symbol for oxygen gas is

- A) O₂ B) O² C) O D) O²⁺

35. Statement- I: Positively charged ion is called a anion.

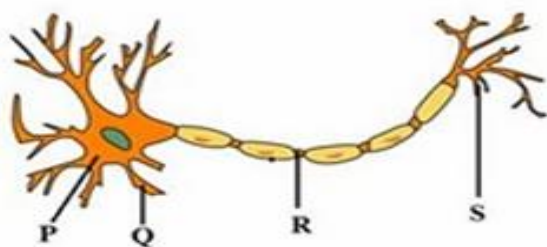
Statement –II: A negatively charged ion is called a cation.

- A) Both statements-I and statement-II are correct.

- B) Statements-I is correct and statement-II is incorrect.
 C) Statements-I is incorrect and statement-II is correct.
 D) Both statements-I and statement-II are incorrect.
36. Complete the chemical reaction: $\text{Mg(s)} + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow ?$
 A) $\text{MgSO}_3 + \text{H}_2\text{O}$ B) $\text{MgSO} + \text{H}_2\text{O} + \text{O}_2$
 C) $\text{MgSO}_4 + \text{H}_2$ D) no reaction
37. What does a pH value of exactly 7 indicate for an aqueous solution at room temperature
 A) Acidic B) Basic C) Neutral D) Acidic or Basic
38. Which two products are formed during the neutralization reaction of an acid and a base?
 A) Salt and Hydrogen gas B) Water and carbon dioxide
 C) Salt and water D) Acid base residue
39. Which of the following best describes isotopes of the same element?
 A) Same mass number, different atomic number
 B) Same atomic number, different mass number
 C) Same number of neutrons, different number of protons
 D) Different number of electrons and protons
40. When alpha particles are allowed to strike thin metal foil, most of them go straight through the foil because
 A) Alpha particles are much heavier than electron
 B) Alpha particles are positively charged
 C) Most part of the atom is empty
 D) Alpha particles move with high velocity

BIOLOGY

41. Read the following statements about cell component A.
- It is large and permanent in eukaryotic cells containing chloroplast.
 - It is bound by a single membrane.
 - It helps in osmoregulation in some eukaryotic and unicellular organisms.
- Identify the cell component A along with one of its associated characteristic features or function.
- A) Mitochondria – Generation of ATP B) Vacuole – Provide turgidity to plant cells
 C) Centriole – Formation of spindle fibres D) Ribosome – Formation of membrane proteins
42. Identify the labelled parts in the given image.



- A) P- Cell body, Q-Nerve ending, R- Axon, S- Dendrite
 B) P- Cell body, Q- Dendrite, R- Axon, S- Nerve ending
 C) P- Dendrite, Q- Cell body, R- Axon, S- Nerve ending
 D) P- Dendrite, Q- Nerve ending, R- Axon, S- Cell body

43. Read the following statements about an organism 'X'

- i) It reproduce by budding
- ii) It is a multicellular organism
- iii) It lives in an aquatic habitat

Identify X based on the information provided

- A) Amoeba B) Hydra C) Euglena D) Paramecium

44. Macronutrients supplied by soil are

- A) carbon, oxygen and nitrogen B) carbon, oxygen and hydrogen
C) nitrogen, phosphorus and potassium D) iron, manganese and boron

45. In which of the given unicellular organisms reproduction takes place through splitting of the parent into two similar individuals?

- A) Spirogyra B) Amoeba C) Chlamydomonas D) Plasmodium

46. Out of the following, which characteristics features fits best as an adaptation of Photosynthesis?

- (I) Large surface area (II) Compactly arranged Palisade Cells
(III) Thick waxy covering over the upper epidermis (IV) Mesophyll cells around the stomatal pore
A) I, III, IV B) I, II, IV C) I and II only D) I, II, III, IV

47. Read the given statements carefully and select the CORRECT option.

Assertion (A): Cytokinin can prevent the plant from ageing during senescence.

Reason (R): Cytokinin causes the mobilisation of nutrients to produce new leaves, lateral branches, etc.

- A) Both A and R are true, and R is the correct explanation for A.
B) Both A and R are true, but R is not the correct explanation for A.
C) A is true, but R is false.
D) A is false, but R is true.

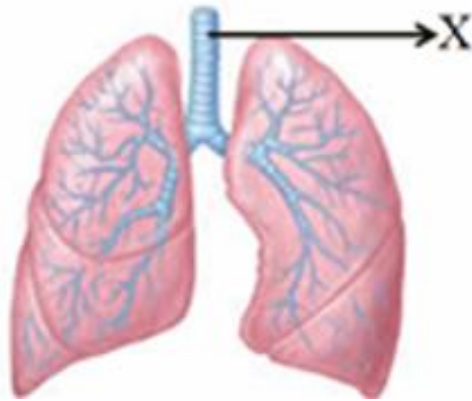
48. Match the following.

Column I	Column II
i. Regulates peristalsis of the alimentary canal	a. Cerebrum
ii. Interprets touch and vision	b. Medulla oblongata
iii. Facilitates body balance	c. Spinal cord
iv. Controls reflexes below the neck	d. Cerebellum

- a. i-b, ii-a, iii-d, iv-c
c. i-b, ii-d, iii-a, iv-c

- b. i-d, ii-a, iii-b, iv-c
d. i-c, ii-a, iii-d, iv-b

49. The given image is showing the human lungs. Identify the type of tissue which lines the structure labelled as "X".



A) Squamous epithelium
C) Cuboidal epithelium

B) Stratified epithelium
D) Ciliated columnar epithelium

50. The site of action of hormone is known as

A) Main organ

B) Secondary organ

C) Primary organ

D) Target organ

