

SAMPLE TEST PAPER A TALENT SEARCH EXAM 2021



Time : 2 Hours

Class : 10th STAGE - 2

Max. Marks : 240

INSTRUCTIONS

DO NOT BREAK THE SEAL WITHOUT BEING INSTRUCTED TO DO SO BY THE INVIGILATOR

[A] General :

1. Attempt ALL the questions. Answer have to be marked on the **OMR** sheets
2. This question paper contains **60 questions**.
3. The question paper consists of **Part-I** and **Part-II**.
4. **Part-I** contains **Section -A** (Q.No. 1 to 20 of Mathematics) and **Section-B** (Q.No. 21 to 30 of Mental Ability)
Part-II contains **Section - A** (Q.No. 31 to 40 of Physics), **Section-B** (Q.No. 41 to 50 of Chemistry) and **Section-C** (Q.No. 51 to 60 of Biology)
5. Blank spaces are provided at the bottom of each page for rough work. No additional sheets will be provided for rough work.
6. Blank paper, clipboard, log tabs, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are **NOT** allowed.
7. Do not Tamper / mutilate the **OMR sheet** or this booklet.
8. Do not break the seals of the question-paper booklet before instructed to do so by the invigilator.
9. **SUBMIT** the OMR sheet to the invigilator after completing the test & take away the test paper with you.

[B] Filling of OMR Sheet :

10. In all the parts, each question will have 4 choices out of which **only one choice is correct**
11. Use only Black/Blue ball point pen for filling the OMR sheet.
12. On the OMR sheet, darken the appropriate bubble for each character of your name, Registration No., Phone No. etc.

[C] Marking Scheme :

13. For each right answer you will be **awarded 4 marks** if you darken the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. In case of bubbling of incorrect answer, **minus one (-1)** mark will be awarded.

Best of Luck

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PART - I**SECTION-A (MATHEMATICS)****(SINGLE CORRECT ANSWER TYPE)**

This section contains **(1-20) multiple choice questions**. Each questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Q.1 If $\sec \theta + \tan \theta = 3$ find the value of $\sin \theta$ is

- (A) $\frac{3}{5}$ (B) $\frac{4}{5}$ (C) 1 (D) $\frac{\sqrt{3}}{2}$

Q.2 $3^{x+1} + 3^{2x+1} = 270$, then x equals to

- (A) 2 (B) 4 (C) 7 (D) 12

Q.3 Ten years hence, the age of Rohan will be twice that of his son. If the sum of the age of Rohan and twice the age of his son is 90 years, then the present age of Rohan is

- (A) 40 years (B) 30 years (C) 50 years (D) 35 years

Q.4 If the equation $x^2 + 2x + 5 = 0$ and $2x^2 + bx + c = 0$ have are common root then

- (A) $b = 2, c = 5$ (B) $b = 4, c = 10$
(C) $b = 0, c = 10$ (D) $b = 2, c = 10$

Q.5 The value of $1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 + \dots + 51^2$

- (A) -1275 (B) 1326 (C) 1308 (D) -50

Space for rough works

Q.6 $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \dots + \frac{1}{100 \times 101}$

- (A) $\frac{100}{101}$ (B) 1 (C) $\frac{1}{101}$ (D) $\frac{2}{101}$

Q.7 The area of the figure formed by $|x| + |y| = 2$ is _____ (in sq. units)

- (A) 2 (B) 4 (C) 6 (D) 8

Q.8 ABC is a triangle in which $AB = 40$ cm, $BC = 41$ cm and $AC = 9$ cm. Then orthocentre of $\triangle ABC$ lies _____.

- (A) interior of the triangle (B) exterior of the triangle
(C) on the triangle (D) at the midpoint of the triangle.

Q.9 If $\frac{b+c-a}{a}, \frac{c+a-b}{b}, \frac{a+b-c}{c}$ are in A.P., then which of the following is in A.P.?

- (A) a, b, c (B) a^2, b^2, c^2 (C) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ (D) None of these

Q.10 The points $(a, b), (a_1, b_1)$ and $(a - a_1, b - b_1)$ are collinear if

- (A) $ab = a_1b_1$ (B) $ab_1 = a_1b$ (C) $a = b$ (D) $a_1 = b_1$

Q.11 The angle of elevation of a kite from the ground is 60° and its height from the ground is 30 m. The length of the string of the kite is

- (A) 20 m (B) $30\sqrt{3}$ m (C) $20\sqrt{3}$ m (D) $10\sqrt{3}$ m

Space for rough works

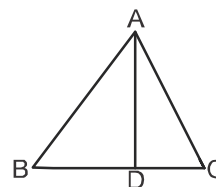
Q.12 In $\triangle ABC$, $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 70^\circ$ and $\angle C = 50^\circ$. Then $\angle BAD =$

(A) 20°

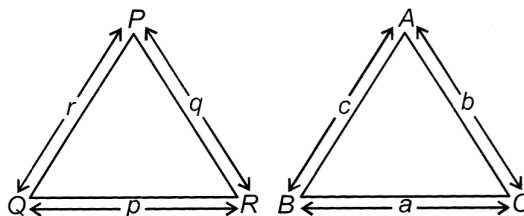
(B) 30°

(C) 50°

(D) 45°



Q.13 In the given figure, $\triangle ABC \sim \triangle PQR$. Then, $\frac{a}{p}$ is always equal to



(A) $\frac{r}{c}$

(B) $\frac{q}{b}$

(C) $\frac{p+q+r}{a+b+c}$

(D) $\frac{a+b+c}{p+q+r}$

Q.14 If the zeroes of the polynomial $x^3 + 5x^2 + 6x + 7$ are $a-b$, a and $a+b$, then the value of a is

(A) $\frac{5}{3}$

(B) -5

(C) $-\frac{5}{3}$

(D) -7

Q.15 If $3 \sin \theta + 4 \cos \theta = 5$, then the value of $\sin \theta$ is

(A) $\frac{2}{3}$

(B) $\frac{4}{5}$

(C) $\frac{3}{5}$

(D) $\frac{5}{3}$

Space for rough works

Q.16 In a right triangle ABC right angled at B, if P and Q are points on the sides AB and BC respectively, then

(A) $AQ^2 + CP^2 = (AC^2 + PQ^2)$

(B) $2(AQ^2 + CP^2) = AC^2 + PQ^2$

(C) $AQ^2 + CP^2 = AC^2 + PQ^2$

(D) $AQ + CP = \frac{1}{2}(AC + PQ)$

Q.17 If the cost of 3 chairs and 2 tables is ₹ 3500 and the cost of 3 tables and 2 chairs is ₹ 4000, then the cost of 2 tables and 2 chairs is

(A) ₹ 3750

(B) ₹ 3250

(C) ₹ 3000

(D) ₹ 2000

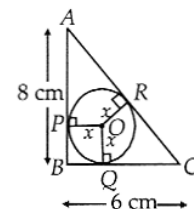
Q.18 ABC is a right angled triangle with $BC = 6$ cm and $AB = 8$ cm. A circle with centre O and radius x cm has been inscribed in $\triangle ABC$ as shown in figure. The value of x is

(A) 1 cm

(B) 2 cm

(C) 3 cm

(D) 4 cm



Q.19 Water flows at the rate of 10 meter per minute from a cylindrical pipe 5 mm in diameter. How long will it take to fill up a conical vessel whose diameter at the base is 40 cm and depth 24 cm ?

(A) 48 minutes 15 secs

(B) 51 minutes 12 secs

(C) 52 minutes 1 sec

(D) 55 minutes

Q.20 Four coins are tossed simultaneously. The probability of getting at least one head is :

(A) $\frac{3}{16}$

(B) $\frac{7}{16}$

(C) $\frac{9}{16}$

(D) $\frac{15}{16}$

Space for rough works

SECTION - B (MENTAL ABILITY)**(SINGLE CORRECT ANSWER TYPE)**

This section contains (21-30) multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Questions 21- 25 : There are Eight persons E, F, G, H, I, J, K and L are seated around a square table – two on each side. There are three lady members and they are not seated next to each other. J is between L and F. G is between I and F. H, a lady member is second to the left of J. L, a male number, is seated opposite of E, a lady member. There is lady member between F and I.

Q.21 Who among the following is seated between E and H?

- (A) F (B) I (C) J (D) None of these

Q.22 How many persons are seated between K and F?

- (A) One (B) Two (C) Three (D) cannot be determined

Q.23 Who among the following are the three lady members?

- (A) E, G and J (B) E, H and G (C) G, H and J (D) cannot be determined

Q.24 Who among the following is to the immediate left of F?

- (A) G (B) I (C) J (D) cannot be determined

Q.25 If there are 3 oranges and you take away 2, how many do you have ?

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

Space for rough works

Q.26 Pointing to a woman, a man said, "The sister of her mother's husband is my aunt." How is he related to that woman?

- (A) Nephew (B) Father (C) Uncle (D) Brother

Direction (Q. No. 27 to Q. No.29) Find the missing number in the following series



- (A) 25 (B) 26 (C) 32 (D) 29

Q.28 2, 9, 28, 65, ?

- (A) 78 (B) 82 (C) 126 (D) 105

Q.29 1, 7, 23, 55, 109, 191, ?

- (A) 225 (B) 180 (C) 317 (D) 307

Q.30 Ram Singh went 20 km to the east, then turned north and walked another 5km. Then he turned west and covered 25km to meet Satnam. How far is Satnam from the point where Ram Singh started?

- (A) $5\sqrt{2}$ km (B) 32 km (C) 5 km (D) 27 km

Space for rough works

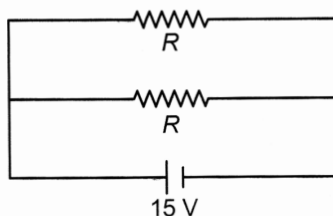
PART - II

SECTION-A (PHYSICS)

(SINGLE CORRECT ANSWER TYPE)

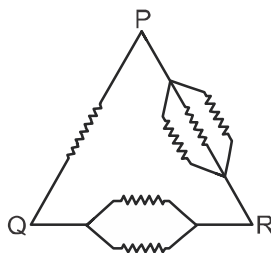
This section contains (31-40) multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Q.31 The value of R for which total power dissipated in the circuit is 150 W is



- (A) $2\ \Omega$ (B) $3\ \Omega$ (C) $7\ \Omega$ (D) $5\ \Omega$

Q.32 Six equal resistances are connected between points P, Q and R as shown in the figure. Then the net resistance will be maximum between



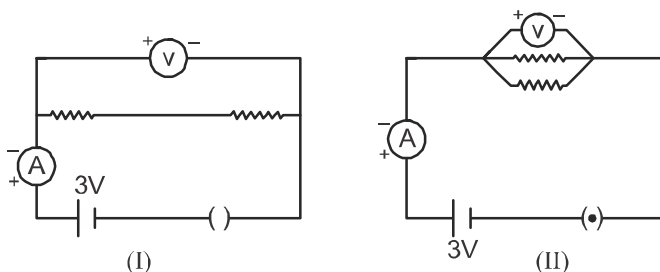
- (A) P and Q (B) Q and R (C) P and R (D) any two points

Space for rough works

Q.33 Which of the following is correct regarding the nature of parallel and anti-parallel currents ?

- (A) Parallel currents repel and antiparallel currents attract.
- (B) Parallel currents attract and antiparallel currents repel.
- (C) No force exist due to both currents.
- (D) None of these.

Q.34 For the two circuit I and II shown below, the voltmeter readings would be



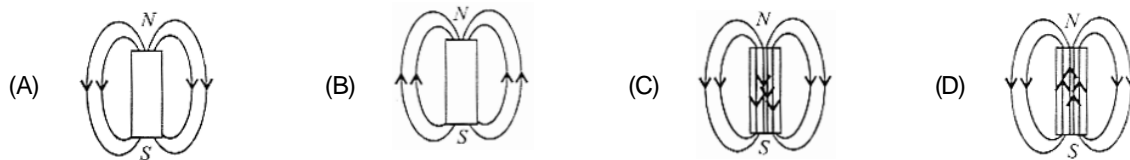
- (A) 0 V in circuit I and 2 V in circuit II.
- (B) 3 V in both the circuits.
- (C) 0 V in circuit I and 3 V in circuit II.
- (D) 3 V in circuit I and 0 V in circuit II.

Q.35 An object 4 cm high is placed at a distance of 15 cm in front of a convex mirror having a radius of curvature of 10 cm. Then the image formed is at a distance of

- (A) 7.5 cm behind the mirror
- (B) 3.75 cm in front of the mirror
- (C) 7.5 cm in front of mirror
- (D) 3.75 cm behind the mirror

Space for rough works

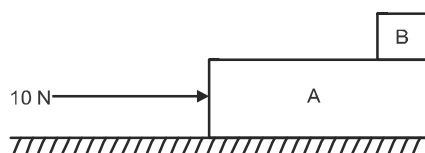
Q.36 The magnetic field lines due to a bar magnet are correctly shown in figure.



Q.37 A ray of light travelling in air is incident on the plane of transparent medium. The angle of incidence is 45° and that of refraction is 30° . Find the refractive index of the medium.

- (A) 2 (B) $\frac{1}{\sqrt{2}}$
(C) 1 (D) $\sqrt{2}$

Q.38 A small block B is placed on block A of mass 5 kg and length 20 cm. If initially the block is placed at the right end of block A. A constant horizontal force of 10 N is applied on the block A. All the surfaces are assumed frictionless. Find the time in which B separates from A.



- (A) 0.2s (B) 0.5 sec (C) $\sqrt{5}$ sec (D) $\frac{1}{\sqrt{5}}$ sec

Space for rough works

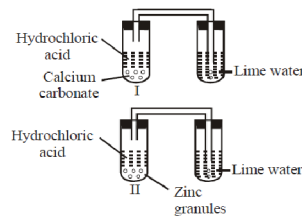
- Q.39 An object of height 5 cm is kept at a distance 25 cm from the optical centre of a converging lens of focal length 10 cm. The height of the image is
- (A) 2.33 cm (B) 2.32 cm
(C) 3.33 cm (D) 2.22 cm
- Q.40 A particle starts from rest with uniform acceleration and its velocity after n seconds is v . The displacement of the body in last two seconds is
- (A) $\frac{v(n+1)}{n}$ (B) $\frac{2v(2n+1)}{n}$ (C) $\frac{2v(n-1)}{n}$ (D) $\frac{v(n-1)}{n}$

Space for rough works

SECTION-B (CHEMISTRY)**(SINGLE CORRECT ANSWER TYPE)**

This section contains **(41-50) multiple choice questions**. Each questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Q.41 Kanav took two test tubes marked as I and II. In test tube I, he put calcium carbonate and hydrochloric acid while in test tube II, he put zinc granules and hydrochloric acid. He passed the gas coming out from both the test tubes in lime water. What are his observations ?



- (A) The gas coming out from test tube I turns lime water milky.
 (B) The gas coming out from test tube II turns lime water milky.
 (C) The gases coming out from both the test tubes turn lime water milky.
 (D) None of these

Q.42 The charge on 1 gram ions of Al^{3+} is : (N_A = Avogadro number, e = charge on one electron)

- (A) $\frac{1}{27} N_A e$ coulomb
 (B) $\frac{1}{3} \times N_A e$ coulomb
 (C) $\frac{1}{9} \times N_A e$ coulomb
 (D) $3 \times N_A e$ coulomb

Q.43 Which of the following correctly represents 360 g of water ?

- (i) 2 mole of H_2O
 (ii) 20 mole of water
 (iii) 6.022×10^{23} molecules of water
 (iv) 1.2044×10^{25} molecules of water
 (A) (i) (B) (i) and (iv) (C) (ii) and (iii) (D) (ii) and (iv)

Space for rough works

Q.44 Which of the following statements are correct ?

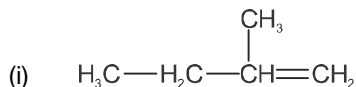
- (I) In the long form of periodic table, the number of period indicates the value of principal quantum number.
 (II) There are four d-block series comprising of total 40 elements in the long form of periodic table.
 (III) s-block, d-block and f-block elements are metals.

(A) (I) and (II) only (B) (I) only (C) (II) and (III) only (D) (I), (II) and (III)

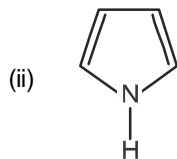
Q.45 Match the following

Structure

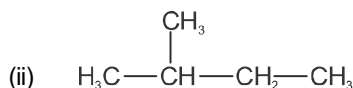
Compounds



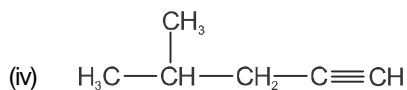
(a) Heterocyclic



(b) Alkyne



(c) Alkane



(d) Alkene

(A) i - d, ii - a, iii - c, iv - b

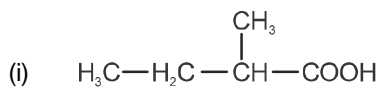
(B) i - c, ii - d, iii - b, iv - a

(C) i - c, ii - b, iii - d, iv - a

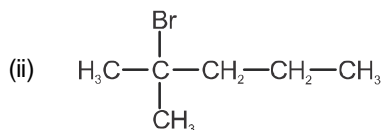
(D) i - c, ii - d, iii - a, iv - b

Space for rough works

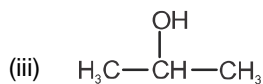
Q.46 Match the following



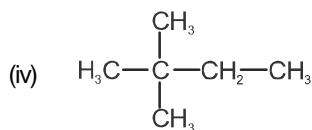
(a) Propan-2-ol



(b) 2, 2-Dimethyl butane



(c) 2-Methyl butan-1-oic acid



(d) 2-Bromo-2-methyl pentane

(A) i - a, ii - c, iii - d, iv - b

(B) i - c, ii - d, iii - b, iv - a

(C) i - c, ii - b, iii - d, iv - a

(D) i - c, ii - d, iii - a, iv - b

Q.47 Ionisation potential of Na would be equal in magnitude with

(A) Electronegativity of Na

(B) Electron Affinity of Na

(C) Electronegativity of Na^+ (D) Electron affinity of Na^+

Q.48 An element with atomic number 40 is placed in period

(A) 5

(B) 6

(C) 4

(D) 3

Space for rough works

- Q.49 The molecular mass of compound A is 168 g/mol. Its empirical formula is C_4H_4S find its molecular formula.
- (A) C_4H_5S (B) $C_8H_8S_2$ (C) C_2H_2S (D) C_2H_4S
- Q.50 The concentration of an HCl solution having pH equal to 2 is 10^{-x} M. Calculate the value of x. Assume complete dissociation of HCl.
- (A) 1 (B) 2 (C) 4 (D) 5

Space for rough works

SECTION-C (BIOLOGY)**(SINGLE CORRECT ANSWER TYPE)**

This section contains (51-60) multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Q.51 Acid rain is due to the precipitation of

- (A) CO_2 (B) Hydrogen sulphide
(C) Oxides of sulphur (D) CFCS

Q.52 Chronic bronchites due to inhalation of cotton fibres over long time is due to

- (A) Silicosis (B) Asbestosis (C) Byssinosis (D) Pneumoniosis

Q.53 The term factor was given by mendel is now known is

- (A) Chromosome (B) DNA (C) Gene (D) Pisum sativum

Q.54 A DNA helix complimentary pairing is always between

- (A) A and C (B) A and G (C) A and T (D) C and T

Q.55 Energy absorb by producer is

- (A) 100 % (B) 10 % (C) 1 % (D) None of these

Space for rough works

Q.56 "Origin of species" was written by

- (A) Mendel (B) Lamarck (C) Darwin (D) Calvin

Q.57 AIDS virus contains genetic material

- (A) DNA (B) RNA (C) Chromosome (D) Gene

Q.58 Sterilization in male is performed surgically by

- (A) Vasectomy (B) Gonorrhoea
(C) AIDS (D) Tubectomy

Q.59 Oestrogen is released from

- (A) Adrenal cortex (B) Pancreas
(C) Testes (D) Ovary

Q.60 Vasopressin is produced by

- (A) Thyroid (B) Pancreas
(C) Adrenal (D) Pituitary

Space for rough works

[illegible]

V-MAT REWARDS & RECOGNITION

