VIDYAPEETH ACADEMY
IIT JEE | NEET | PRE FOUNDATION

Vidyapeeth Mental Aptitude Test
V-MAT
Session - 2024-25

SAMPLE TEST PAPER
A TALENT SEARCH EXAM 2024

Time : 2 Hours	Class : 8ᵗʰ_ STAGE - 2	Max. Marks : 240

INSTRUCTIONS

[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 tabes, silde rules, calculators, cellular phones, pagers and electronic gadgets in any form are **NOT** allowed.

7.   Do not Tamper / multilate 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 corrrect 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

Corporate Office :

📍 **Grand Plaza, Fraser Road, Dak Bunglow, Patna-1, 8448446676, 9631835989**

Our Branch:

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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   What disit will be at the unit place of $(2017)^{2017}$

    (A)   9   (B)   7   (C)   3   (D)   1

Q.2   Find the number of factors of 1080.

    (A)   32   (B)   28   (C)   24   (D)   36

Q.3   Mukesh bought 3 apples, 5 bananas and 7 custard apples for certain amount (which is even). The cost of apples, bananas and custard apples could be (in Rs)

    (A)   5, 7, 9   (B)   9, 8, 6   (C)   2, 4, 5   (D)   9, 10, 11

Q.4   What should be added to 2714 to make the sum a perfect cube ?

    (A)   10   (B)   517   (C)   30   (D)   150

Q.5   Find how many three-digit perfect cubes are there whose sum of the digits is perfect square.

    (A)   1   (B)   2   (C)   3   (D)   4

Q.6   If $4(4x)^7 = 4^{6^2}$, then what is the value of x ?

    (A)   5   (B)   25   (C)   64   (D)   256

Space for rough works

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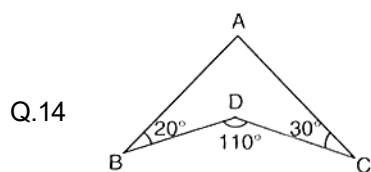
Q.7   A number is multiplied by half of itself and then 32 added to the product. if the final result is 130, then find the original number.

(A)   4   (B)   7   (B)   5   (D)   14

Q.8   If $11^x = 3^y = 99^z$, then $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} =$

(A) $\dfrac{2}{z} - \dfrac{1}{y}$ (B) $\dfrac{2}{z} + \dfrac{1}{y}$ (C) $-\dfrac{1}{y}$ (D)   0

Q.9   The LCM of the polynomials $(x-3)(x+5)^2$, $(x+5)(x-7)^2$ and $(x-7)(x-3)^2$ is

(A) $(x-3)(x-7)(x-5)$ (B)   1

(C) $(x-3)^2(x-7)^2(x+5)^2$ (D) $(x-3)^2(x-7)^2$

Q.10   If $h(y) = y^2$ and $g(z) = z^3$, then the HCF of $h(b) - h(a)$ and $g(b) - g(a)$ is

(A) $a + b$ (B) $a^2 - b^2$ (C) $b - a$ (D)   None of these

Q.11   A vendor bought 5 lemons for a rupee. How many lemons must be sold for Rs 7 to gain $16\dfrac{2}{3}\%$?

(A)   30   (B)   35   (C)   49   (D)   None of these

Q.12   A train takes 10 seconds to cross bridge of length 100 m travelling at 90 kmph. Find the length of the train (in m).

(A)   120   (B)   130   (C)   140   (D)   150

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Q.13 Shiva walks at 3 km/h from his house and reaches his office 17 minutes late. If he walks at 5km/h he is early to the office by 15 minutes. Find the distance between his office and house.

(A)   3 km   (B)   5 km   (C)   4 km   (D)   2 km

Q.14

In the figure above, $\angle ABD = 20^o$, $\angle BDC = 110^o$ and $\angle DCA = 30^o$. What is the value of $\angle BAC$?
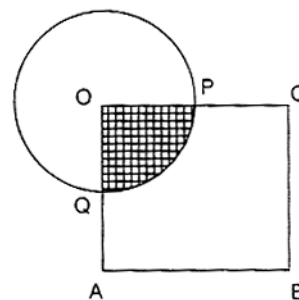
(A) 30° (B) 60° (C) 90° (D) 120°

Q.15 If $\left(\dfrac{a}{b}\right) + \left(\dfrac{b}{a}\right) = 2$, then fing $\left(\dfrac{a}{b}\right)^{10} - \left(\dfrac{b}{a}\right)^{10}$.

(A) $\dfrac{20^{20} - 1}{2^{10}}$ (B)   2   (C)   0   (D) $\dfrac{2^{20} + 1}{2^{10}}$

Q.16 In the figure below, O is the centre of the circle and OABC is a square. P and Q are the midpoints of OC and OA respectively. The area of the square (in cm^2), if the area of the shaded part is $38.5 \ cm^2$, is _____.

(A)   49

(B)   81

(C)   144

(D)   196

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Q.17 $\sqrt[3]{1 + 3 + 5 + 7 + ... + 53}$ = _____ .

(A)   11   (B)   13   (C)   7   (D)   9

Q.18   If $\sqrt{x} + \dfrac{58}{\sqrt{x}} = 31$, then which of the following can be the value of x ?

(A)   529   (B)   931   (C)   729   (D)   841

Q.19   If $x^2 + y^2 - xy = 3$ and $y - x = 1$, then find $\dfrac{xy}{x^2 + y^2}$.

(A) $\dfrac{2}{5}$ (B) $\dfrac{5}{2}$ (C) $\dfrac{3}{2}$ (D) $\dfrac{5}{3}$

Q.20   If $P : Q : R = 2 : 3 : 4$ and $P^2 + Q^2 + R^2 = 11600$, then find $P + Q - R$, where P, Q and R whole numbers.

(A)   15   (B)   16   (C)   18   (D)   20

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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.

Q.21   The day before the day before yesterday is three days after saturday. What day is it today?

(A)   Monday   (B)   Tuesday   (C)   Thrusday   (D)   Friday

Q.22   Which letter is least like the others ?

Z   M   F   N   H   K

(A)   M   (B)   Z   (C)   K   (D)   F

Q.23   At a conference, 12 members shook hand with each other before & after the meeting. How many total number of hand shakes occured ?

(A)   100   (B)   132   (C)   145   (D)   144

Q.24   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

Q.25   Find the missing term : 3,   1,   4,   5,   9,   14,   23,   ?

(A)   32   (B)   37   (C)   41   (D)   28

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Direction (Q. No. 26 to Q. No.27)

In each of the following questions, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and fill in the blank spaces.

Q.26   4, 10, (....), 82, 244, 730

(A)   24   (B)   28   (C)   77   (D)   21
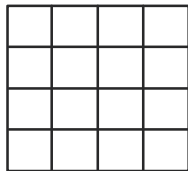
Q.27   17, 19, 23, 29, (....), 47

(A)   37   (B)   33   (C)   35   (D)   36

Q.28   Find the next number for the given squence.

11, 12, 15, 21, 31, ?

(A)   46   (B)   45   (C)   38   (D)   40

Q.29   Find the total number of square in the given figure

(A)   16   (B)   30   (C)   25   (D)   28

Q.30   In a certain code language, BENCHMARK is written as CNEBHKRAM. How is DESPERATE coded in that ?

(A)   PSEDETARA   (B)   PSEDEETRA   (C)   PSEDEETAR   (D)   EDPSEARET

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   A car increases its speed from 36 km/hr to 72 km/hr in 10 s. It's acceleration is?

(A) $1 \, m/s^2$ (B) $2 \, m/s^2$ (C) $3.6 \, ms/^2$ (D) $5 \, ms/^2$

Q.32   When an apple falls from a tree:

(A)   only earth attracts the apple   (B)   only apple attracts the earth

(C)   both the earth and apple attract each other   (D)   None of these

Q.33   If there is no flow of charge between two charged bodies when they are connected to each other. Then

(A)   they have the same quantity of charge   (B)   they have the same energy

(C)   they have the same potential   (D)   None of these

Q.34   Mirages are observed in deserts due to the phenomenon of

(A)   interference of light   (B)   total internal reflection of light

(C)   scattering of light   (D)   double refraction of light

Q.35   Action-reaction forces

(A)   act on same body   (B)   act on different bodies

(C)   act along different lines   (D)   act in same direction

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Q.36 Find the wavelength of a wave whose time period is 0.05 s and speed is 200m/s

(A) 5 m   (B) 10 m   (C) 15 m   (D) 20 m

Q.37 A brick of weight 80 N stands upright on the ground as shown in figure. The pressure exerted on the ground by brick is

(A) $\dfrac{5 \times 10}{80} \times 10^{-4}\, Nm^{-2}$

(B) $80 \times 5 \times 10^{-4}\, Nm^{-2}$

(C) $\dfrac{10}{80 \times 5 \times 10^{-4}}\, Nm^{-2}$

(D) $\dfrac{80}{10 \times 5 \times 10^{-4}}\, Nm^{-2}$
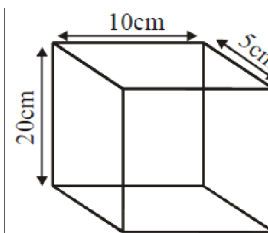
Q.38 In a _____wave, matter in the medium moves forward and backward in the same direction as the wave.

(A) transverse   (B) longitudinal

(D) refracted   (D) reflected

Q.39 If the angle of incidence of a light ray is 60°, then the angle of deviation of reflected ray will be

(A) 30°   (B) 60°

(C) 90°   (D) 120°

Q.40 The reason assigned for the formation of day and night on the earth is the :

(A) revolution of the sun around the earth.   (B) revolution of the earth around the sun.

(C) rotation of the earth on its own axis.   (D) revolution of the moon around the earth.

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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 ?
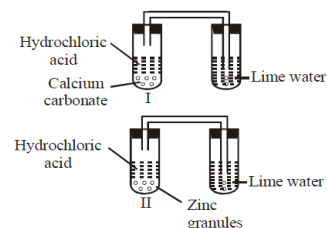
(A)   The gas coming out from test tube I turns lime water milky.

(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   Rahul had a mixture, he separated the constituents of the mixture in the following way

The mixture could be

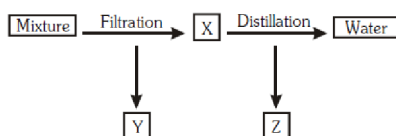(A)   water + sand + iron fillings   (B)   stone + rice + water

(C)   oxygen + hydrogen + salt   (D)   sand + sugar + water

Q.43   If the formulae of oxide of X and nitride of Y are X_2O_3 and X_3N_2 respectively then the valencies of X and Y are

(A)   3 and 2   (B)   3 and 4   (C)   1 and 1   (D)   1 and 4

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Q.44 The four diagrams below represents the results of mixing atoms of different substances. Each atom is represented by a different symbol. Which diagram correctly shows a chemical change ?

(A)

(B)

(C)

(D)
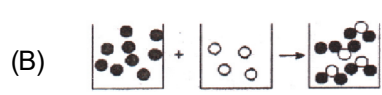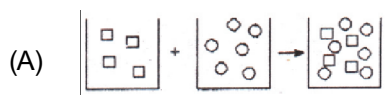
Q.45 Which of the following elements does not have neutron

(A)   H   (B)   He   (C)   Mg   (D)   Li

Q.46 Find the odd one out

(A)   Li   (B)   K   (C)   Na   (D)   Mg

Q.47 The nucleus of an atom is

(A)   Positively charged

(B)   Negatively charged

(C)   Neutral

(D)   None of these

Q.48 Oxygen can be supplied to a fish tank by bubbling air in to water. The pressure and the volume of the air bubbles while they are rising respectively

(A)   Decreases, increases

(B)   Decreases, decreases

(C)   Increases, decreases

(D)   Increases, increases

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Q.49   The acid used in the making of vinegar is :

(A)   formic acid   (B)   acetic acid

(C)   sulphuric acid   (D)   nitric acid

Q.50 $? + O_2 \rightarrow 2K_2O$

(A)   K   (B) K_2

(C)   2K   (D)   4 K

────────────── *Space for rough works* ──────────────

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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   Which chemical method is used to prevent rust of wheat in the crop ?

(A)   Pesticides   (B)   rodenticide   (C)   Fungicide   (D)   Herbicide

Q.52   Pasteurisation of milk destroys

(A)   fats   (B)   vitamins   (C)   Proteins   (D)   Bacteria

Q.53   Viruses are

(A)   Eukaryotes   (B)   Microbes   (C)   Prokaryotes   (D)   Protozoans

Q.54   The disease that spreads through air water, food or physical contact is

(A)   waterborne   (B)   communicable   (C)   bacterial   (D)   viral

Q.55   To make milk bacteria free it is heated to

(A) $50^\circ C$ (B) $90^\circ C$ (C) $70^\circ C$ (D) $100^\circ C$

Q.56   This is not found in an animal cell

(A)   mitochondrion   (B)   cell wall   (C)   nucleus   (D)   nucleolus

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Q.57   Which of the following cells found in human can change their shape

(A)   nerve cell   (B)   WBC   (C)   muscle cell   (D)   RBC

Q.58   The organism which has both the male and female sex organs is called

(A)   multisexual   (B)   Hermaphrodite

(C)   unisexual   (D)   None of these

Q.59   The first menstrual flow is called

(A)   menopause   (B)   menarche

(C)   preganancy   (D)   implantation

Q.60   This hormone prepares the body to fight or run fast

(A)   insulin   (B)   Testosterone

(C)   adrenaline   (D)   thyroxine

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ANSWER KEY V-MAT 2024 STATE – 2_ Class-8th

	MATH		MENTAL ABILITY		PHY		CHE		BIO
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answers
1	B	21	D	31	A	41	A	51	C
2	A	22	A	32	C	42	D	52	D
3	D	23	B	33	C	43	A	53	C
4	C	24	D	34	B	44	B	54	B
5	A	25	B	35	B	45	A	55	C
6	D	26	B	36	B	46	D	56	B
7	D	27	A	37	D	47	A	57	B
8	A	28	A	38	B	48	A	58	B
9	C	29	B	39	B	49	B	59	B
10	C	30	C	40	C	50	D	60	C
11	A								
12	D								
13	C								
14	B								
15	C								
16	D								
17	D								
18	D								
19	A								
20	D								

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