VMC Vidyamandir Classes SINCE 1986

IIT JEE | MEDICAL | FOUNDATION

| Sample Paper | 4 Year (Foundation) |
|---|---|

**Duration: 2 Hrs** **Maximum Marks: 180**

**For Students Presently in Class 8 (Stream: Foundation)**

**PAPER SCHEME:**

- This paper contains **35 Objective Type Questions** divided into four sections: **Section - I, Section – II, Section - III** and **Section - IV**
- **Section I** contains **5 Multiple Choice Questions (1-5)** based on **Mental Aptitude**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section II** contains **10 Multiple Choice Questions (6-15)** based on **Science**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section III** contains **10 Multiple Choice Questions (16-25)** based on **Mathematics**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section IV** contains **10 Numerical Value Type Questions (1-10).** The answer to each of these questions ranges from 0 to 99.

**MARKING SCHEME:**

- **Section I**: For each question, **4 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.
- **Section II & III**: For each question, **5 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.
- **Section IV:** For each question, **6 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.

## SECTION – I | MENTAL APTITUDE

**1.** In a certain code language, if the word "REASON" is coded as TGCQML, then "MANUAL" is coded as:

**(A)** OCPWCN **(B)** OCPSYJ

**(C)** OCPSJY **(D)** OCPNCW

**2.** If "EXAMINATION" = 121 and "PAPER" = 25, then what is the value of "TREASURE" ?

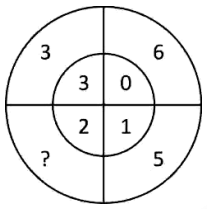
**(A)** 64 **(B)** 360

**(C)** 290 **(D)** 81

**3.** Prashant is seventeenth from the right end of the row and Vijay is fourteenth from the left end of the row. If Rajneesh is fourth to the right of Prashant and third to the left of Vijay, how many persons are there in the row?

**(A)** 17 **(B)** 19 **(C)** 23 **(D)** 38

**4.** Find the Missing Number?




**(A)** 6 **(B)** 4 **(C)** 8 **(D)** 10

**5.** Shiva travels 10 *m* towards West. He turns left and travels 15 *m*. Again, he turns to his left and walks 10 *m* further. Finally, he walks 13 *m* towards North and then stops. At what vertical distance is he from his house?

**(A)** 13 *m* **(B)** 15 *m*

**(C)** 28 *m* **(D)** 2 *m*

## SECTION – II | SCIENCE

**6.** An electric fuse protects electrical appliances by

**(A)** Increasing the current

**(B)** Storing electricity

**(C)** Melting when excess current flows

**(D)** Producing heat

**7.** Friction reduces efficiency of machines due to :

**(A)** Production of heat **(B)** Wearing out of moving parts

**(C)** Increase in energy consumption **(D)** All of these

**8.** The strength of an electromagnet can be increased by

**(A)** Reducing the number of turns

**(B)** Increasing the current through the coil

**(C)** Removing the iron core

**(D)** Using a wooden rod

**9.** When you kick a football, the force applied is mainly

**(A)** Magnetic force **(B)** Muscular force

**(C)** Electrostatic force **(D)** Gravitational force

**10.** Boiling points of some gases are given below:

| **Gas** | **Boiling point (°C)** |
|---|---|
| Helium | –269 |
| Methane | – 162 |
| Neon | –246 |
| Oxygen | –183 |
| Xenon | –108 |

The gases that would exist in liquid state at –200°C are:

**(A)** Methane, Oxygen and Xenon **(B)** Helium, Neon and Xenon

**(C)** Helium and Neon **(D)** Oxygen and Helium

**11.** Which of these is not a pure substance?

**(A)** Tin **(B)** Lead **(C)** Carbon dioxide **(D)** Bronze

**12.** Which food preservation method involves heating to 70°C and rapid cooling?

**(A)** Pasteurization **(B)** Fermentation

**(C)** Dehydration **(D)** Freezing

**13.** What gases are primarily present in biogas produced by microorganisms?

**(A)** Oxygen and nitrogen **(B)** Carbon dioxide and methane

**(C)** Hydrogen and nitrogen **(D)** Oxygen and methane

**14.** Micro-organism used for commercial production of wine and alcohol is :

**(A)** Yeast **(B)** *Lactobacillus*

**(C)** *Propionibacterium* **(D)** *Streptococci*

**15.** Consider the following statements about microorganisms:

**Statement I:** Bacteria and *Amoeba* are examples of unicellular microorganisms.

**Statement II:** All fungi are unicellular and cannot exist as multicellular organisms.

**(A)** Both statement I and Statement II are correct

**(B)** Statement I is correct, but Statement II is incorrect

**(C)** Statement I is incorrect, but Statement II is correct

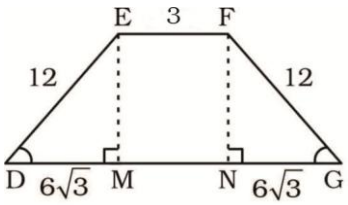
**(D)** Both Statement I and Statement II are incorrect

## SECTION – III | MATHEMATICS

**16.** $ABCD$ is a rhombus such that $\angle ACB = 40°$. Then $\angle ADB$ is:

**(A)** 40° **(B)** 45° **(C)** 50° **(D)** 60°

**17.** In the given figure. area of isosceles trapezium $DEFG$ is:(in square units)




**(A)** $18+36\sqrt{3}$ **(B)** $6+36\sqrt{3}$ **(C)** $9+\sqrt{3}$ **(D)** $9+3\sqrt{3}$

**18.** If $x=\frac{1}{1+\sqrt{2}}$, then the value of $x^2+2x+3$ is:

**(A)** 3 **(B)** 0 **(C)** 4 **(D)** 1

**19.** If $a+b+c=0$, then $\frac{a^2}{bc}+\frac{b^2}{ca}+\frac{c^2}{ab}$ is :

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

**20.** The value of $\sqrt{17+4\sqrt{13}}-\sqrt{17-4\sqrt{13}}$ is :

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

**21.** The units digit of $(257)^{406}$ is :

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

**22.** The greatest number that can divide 545 and 726 by leaving remainders 5 and 6 respectively, is:

**(A)** 90 **(B)** 180 **(C)** 45 **(D)** 60

**23.** If $a=1-2x, b=2x-3$ and $c=2$, then $a^3+b^3+c^3=$ _____.

**(A)** $3(1-2x)(2x-3)$ **(B)** $6(1-2x)(2x-3)$

**(C)** $9(1-2x)(2x-3)$ **(D)** $2(2x-3)(1-2x)$

**24.** If $N=\frac{\sqrt{15}+\sqrt{35}+\sqrt{21}+5}{\sqrt{3}+2\sqrt{5}+\sqrt{7}}$, then $\left(2N-\sqrt{3}\right)^2-7$ is equal to :

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

**25.** $\frac{1}{1+x^{(b-a)}+x^{(c-a)}}+\frac{1}{1+x^{(a-b)}+x^{(c-b)}}+\frac{1}{1+x^{(b-c)}+x^{(a-c)}}=$ _____.

**(A)** 0 **(B)** 1 **(C)** $x^{a-b-c}$ **(D)** None of these

## SECTION - IV [NUMERICAL VALUE TYPE QUESTIONS]

**This Section contains 10 Integer-Type Questions. Each question has an integer answer between 0 and 99. Enter the correct Numerical Value.**

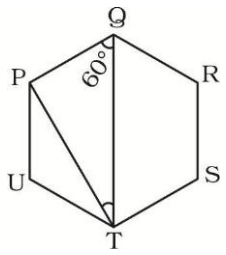
**1.** Let $a$, $b$, $c$ be positive real numbers such that $abc \neq 1$, $(ab)^2 = (bc)^4 = (ca)^x = abc$, then $10x$ is equal to _____.

**2.** If $a$ and $b$ are positive numbers and $a^b = b^a$ such that $b = 9a$, then the value of $a^4$ is _____.

**3.** How many diagonals does a regular hexagon have?

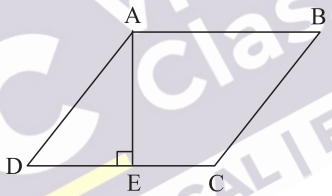
**4.** If the square root of 1234321 is subtracted from the square of 51, then the smallest positive number that should be added to the resultant to make it a perfect square is _____.

**5.** In the given figure, $PQRSTU$ is a regular hexagon. If $\angle PQT = 60°$, then find $\angle PTQ$ (in degrees).




**6.** If $9x^2 - 36x + 35 = (3x - a)(3x - b)$, where $a$, $b$ are natural numbers such that $a > b$ and the value of $a^2 + b^2 - c^2 = 70$, $(c > 0)$, then the value of $(a - b - c)$ is _____.

**7.** In the given figure, $ABCD$ is a rhombus, $DE = 3$ *cm* and $AE = 4$ *cm*. The perimeter of the rhombus (in *cm*) is _____.




**8.** In a cryptarithm problem, if:

$$\begin{array}{r} A\ B \\ +\ B\ A \\ \hline 9\ 9 \end{array}$$

Then $A + B =$ _____.

**9.** The value of $\sqrt{\dfrac{8^{10} + 4^{10}}{8^4 + 4^{11}}}$ is _____.

**10.** The remainder when 987654 is divided by 11 is____.

**End of Sample Paper | 4 Year Foundation**