VIJAY EDUCATION ACADEMY
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**VTSE - 2015**
Scholarship & Talent Reward Exam.

# SAMPLE PAPER

Max. Marks : 180 Duration : 120 Minutes

**Please read the instructions carefully. You are allotted additional 5 minutes specifically for this purpose.**

## CLASS IX

**Write your Name and VTSE SAMPLE PAPER Student Registration No. In the space provided below.**

NAME : _____ REG. NO. : ☐☐☐☐☐☐☐☐☐☐

### GENERAL INSTRUCTIONS EXAMINATION HALL

**A. General :**

1 This Question Paper contains 60 questions. Please check before starting to attempt. The question paper consists **4 parts Mathematics(1 to 30), Chemistry(31 to 40), Physics (41 to 50), Biology (51 to 60).**

2 Space is provided within question paper for rough work hence no additional sheets will be provided.

3 Blank paper, clipboard, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are **not** allowed inside the examination hall.

4 Do not Tamper / mutilate the **ORS** or this booklet.

5 SUBMIT the ORS to the invigilator after completing the test & take away the test paper with you.

6 Any student found/reported using unfair means to improve his/her performance in the test, shall be disqualified from VTSE.

7 Objective Response Sheet (ORS), is provided separately.

8 Do not break the seals of the question-paper booklet before instructed to do so by the invigilators.

**B. How to fill Objective Response Sheet (ORS) for filling details marking answers:**

9 Use only HB Pencil/Blue or Black ball point pen for filling the ORS. Do not use Gel/lnk/Felt pen as it might smudge the ORS.

10 Write your VTSE Student Registration No. in the boxes given at the top left corner of your ORS with blue/black ball point pen. Also, darken the corresponding bubbles with HB Pencil/Blue or Black ball point pen only.

11 If any student does not fill his/her VTSE Student Registration No. correctly and properly, then his/her ORS will not be checked/ evaluated.

12 Since it is not possible to erase and correct pen filled bubble, you are advised to be extremely careful while darken the bubble corresponding to your answer.

13 Neither try to erase / rub / scratch the option nor make the Cross (X) mark on the option once filled. Do not scribble, smudge, cut, tear, or wrinkle the ORS. Do not put any stray marks or whitener anywhere on the ORS.

14 If there is any discrepancy between the written data and the bubbled data in your ORS, the bubbled data will be taken as final.

**C. Question paper format and Marking scheme :**

15 In **Section I** (Total Marks : 90), for each question you will be **awarded 3 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. In all other cases, **minus one (–1) mark** will be awarded.

16 In **Section II** (Total Marks : 30), for each question you will be **awarded 3 marks** if you darken **ALL** the bubble(s) corresponding to the correct answer(s) and **zero marks** if no bubble is darkened. In all other cases, **minus one (–1) mark** will be awarded.

17 In **Section III** (Total Marks : 30), for each question you will be **awarded 3 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. In all other cases, **minus one (–1) mark** will be awarded.

18 In **Section IV** (Total Marks : 30), for each question you will be **awarded 3 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. In all other cases, **minus one (–1) mark** will be awarded.

## SECTION – I
## MATHEMATICS

**1.** For $x^2 + 2x + 5$ to be a factor of $x^4 + px^2 + q$, then the values of p and q must be

(a) 5, 25 (b) 10, 20 (c) -2, 5 (d) 6, 25

**2.** L.C.M. of $\pi$ & 1

(a) $\pi$ (b) 1 (c) not define (d) None of these

**3.** L.C.M. of $\frac{1}{5}$ and $\frac{3}{5}$

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$ (c) 5 (d) None of these

**4.** If $(x^2 + 3x + 5)(x^2 - 3x + 5) = m^2 - n^2$, then n =

(a) $x^2 - 3x$ (b) $x^2 + 5$ (c) $3x$ (d) None of these

**5.** Find the value of x if $\frac{13^3 + 7^3}{13^2 + 7^2 - x} = 20$

(a) 91 (b) 20 (c) 19 (d) None of these

**6.** The expression $2x^3 + px^2 + qx + 3$, where p and q are constants, has a factor of (x - 1) and leaves a remainder of 15 when divided of (x + 2). Find the value of p and q respectively.

(a) $-3, -8$ (b) $3, 8$ (c) $8, -3$ (d) None of these

**7.** The value of $\frac{(x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3}{(x - y)^3 + (y - z)^3 + (z - x)^3}$ is

(a) $3(x + y)(y + z)(z + x)$ (b) $3(x - y)(y - z)(z - x)$

(c) $(x + y)(y + z)(z + x)$ (d) $(x - y)(y - z)(z - x)$

**8.** In a right angle triangle the point of intersection of perpendicular bisector of sides is

(a) Internal point of a triangle (b) External point of a triangle

(c) Mid point of the base (d) Mid point of the hypotenuse

**9.** The locus of a point equidistant from the three sides of a triangle is

(a) circumcentre (b) centroid (c) Orthocentre (d) Incentre.

**10.** A triangle and a trapezium are equal in area. They have the same altitude. If the base of the triangle is 32 cm, the mean of the parallel sides of the trapezium is

(a) 16 cm (b) 32 cm (c) 8 cm (d) None of these

**11.** The supplementary angle of an angle is two-third of itself. Then the angles of its supplement are

(a) $135^\circ, 45^\circ$ (b) $60^\circ, 180^\circ$ (c) $120^\circ, 360^\circ$ (d) $108^\circ, 72^\circ$

**12.** If $x^{\frac{1}{3}} + y^{\frac{1}{3}} + z^{\frac{1}{3}} = 0$ then

(a) $(x + y + z)^3 = 0$ (b) $x + y + z = 27\,xyz$ (c) $x^3 + y^3 + z^3 = 27\,xyz$ (d) $(x + y + z)^3 = 3xyz$

**13.** The linear equation $3x + 4y = 12$ cuts the x-axis at

(a) $(4, 0)$ (b) $(0, 3)$ (c) $\left(2, \frac{3}{2}\right)$ (d) $\left(-2, \frac{9}{2}\right)$

**14.** Point of intersection of the lines $x + y = 1$ and $2x + 3y = 6$

(a) $(2, -1)$ (b) $(3, -2)$ (c) $(4, -3)$ (d) $(-3, 4)$

**15.** Which of the following numbers has the terminal decimal representation ?

(a) $\frac{12}{7}$ (b) $\frac{2}{3}$ (c) $\frac{243}{9}$ (d) $\frac{3456}{5}$

**16.** Find the values of a an b if $\frac{\sqrt{7}+1}{\sqrt{7}-1} - \frac{\sqrt{7}-1}{\sqrt{7}+1} = a + b\sqrt{7}$

(a) $a = 0, b = \frac{-2}{3}$ (b) $a = 0, b = \frac{2}{3}$ (c) $a = \frac{2}{3}, b = 0$ (d) $a = \frac{-2}{3}, b = 0$

**17.** The remainder when $x^4 - y^4$ is divided by x + y is

(a) $x - y$ (b) $x^2 - y^2$ (c) 0 (d) $x^2 + y^2$

**18.** The quotient 'q' of the polynomial $(5x^2 + 14x + 2)^2 - (4x^2 - 5x + 7)^2$ when it is divided by $(x^2 + x + 1)$

(a) $q = x^2 + 19x - 5$ (b) $q = 9(x^2 + 19x - 5)$ (c) $q = x^2 - 19x + 5$ (d) $q = 9(x^2 - 19x + 5)$

**19.** Find the value of k if $\frac{a^2 - 19a - 10}{a - 7} = (a - 12) + \frac{k}{(a - 7)}$

(a) -109 (b) -84 (c) -94 (d) -64

**20.** Find the remainder when $3x^3 - 5x^2 + 7x + 5$ is divided by 2x + 1

(a) 0 (b) $\frac{9}{8}$ (c) $\frac{1}{8}$ (d) 5

**21.** A solid cylinder has total surface area of 462 $cm^2$. Its curved surface area is one third of its total surface are. Find the ratio of height of cylinder to the radius of cylinder.

(a) 1 : 1 (b) 2 : 1 (c) 2 : 3 (d) None of these

**22.** The difference between outside and inside surfaces of a cylindrical metallic pipe 14 cm long is 44 $cm^2$. If the pipe is made of 99 $cm^3$ of metal, find the inner radius of the pipe.

(a) 2.5 cm (b) 2 cm (c) 3.5 cm (d) 3 cm.

**23.** Find the area of a rhombus having each side equal to 13 cm and one of whose diagonal is 24 cm.

(a) $100\ cm^2$ (b) $120\ cm^2$ (c) $140\ cm^2$ (d) $160\ cm^2$

**24.** Together, Ajay and Amit plough a field in 4 days. Amit alone takes 6 days to plough the same field. In how many days can Ajay alone plough the field ?

(a) 12 days (b) 8 days (c) 10 days (d) 6 days

**25.** A and B can do a piece of work in 12 days; B and C in 15 days ; C and A in 20 days. In how many days will they finish it together?

(a) 5 days (b) 10 days (c) 15 days (d) 8 days

**26.** Rani's weight is 25% that of Meena's and 40% that of Tara's. What is the ratio of Tara's weight to the Meena's weight ?

(a) $\frac{5}{8}$ (b) $\frac{8}{5}$ (c) $\frac{2}{3}$ (d) $\frac{3}{2}$

**27.** The earth taken out from a pit is evenly spread over a rectangular field of length 90 m, width 60 m. If the, volume of the earth dug is 3078 $m^3$. Find the height of the field raised.

(a) 60 cm (b) 58 cm (c) 50 cm (d) 57 cm

**28.** Water flows through a pipe of internal diameter 7 cm at 2 cm per second. What is the volume of water (inlitres) discharged in 10 minutes ?

(a) 4620 (b) 6240 (c) 6420 (d) 4260

**29.** Choose the correct statement.

(a) Length of diagonals of rectangle, square and issosceles trapezium are equal.

(b) If the diagonals of a quadrilateral intersect at right angles, it is a rhombus.

(c) The diagonals of a parallelogram are equal.

(d) The diagonals of a rectangle are perpendicular bisector to each other.

**30.** The hypotenuse of a right triangle is 25 cm. The difference between the lengths of the other two sides of the triangle is 5 cm. Find the length of longer side of triangle.

(a) 20 cm (b) 15 cm (c) 10 cm (d) 30 cm.

## SECTION – II
## CHEMISTRY

**31.** 40 ml gas is collected at 25°C. If the temperature is raised by 75°C remaining pressure constant. What would be the new volume of the gas.

(a) 46.71 ml (b) 120 ml (c) 13.33 ml (d) 50.06 ml

**32.** 1 atmosphere is not equal to

(i) $1.01325 \times 10^5$ Kpa (ii) 760 torr

(iii) $1.01325 \times 10^5$ N / m$^2$ (iv) 760 mm Hg

(v) 1.01325 bar

(a) only (i) & (v) (b) only (ii) & (iv) (c) only (i) (d) only (iii)

**33.** The size of particles of a colloidal solution is

(a) $10^{-5} - 10^{-7}$ cm (b) $10^{-7} - 10^{-9}$ cm (c) $10^{-9} - 10^{-11}$ cm (d) $10^{-2} - 10^{-3}$ cm

**34.** About colloidal solution which statement is not correct.

(a) Lyophilic colloids are also called as protective colloid.

(b) Tyndal effect is due to scattering of light by particles of dispersion medium

(c) Brownian motion provide stability to colloidal solution.

(d) Colloidal solution and suspension are heterogeneous in nature whereas true solution is homogeneous in nature.

**35.** Calculate the number of sulphur molecules in 640 g of sulphur

(a) $1.5 \times 10^{24}$ (b) $1.2 \times 10^{25}$ (c) $6.02 \times 10^{24}$ (d) 2.5

**36.** If molecular formula of metal chloride is M$Cl_3$ then the formula of metal pyrophosphate will be

(a) $MPO_4$ (b) $M_4(P_4O_7)_3$ (c) $M(P_4O_7)_3$ (d) $MP_4O_7$

**37.** What is the molar mass of glauber salt

(a) 270 (b) 318 (c) 327 (d) 322

**38.** In the compound of C, N and O the ratio of C : H is 9 : 1 and ratio of H : N is 2 : 7. Find empirical formula of the compound.

(a) $C_2H_3N$ (b) $C_3H_4N$ (c) $C_3H_2N$ (d) $CH_5N$

**39.** Calculate the molecules of carbon monoxide having the same number of oxygen atoms as are present in 32 g of sulphur trioxide

(a) $6.023 \times 10^{23}$ (b) $9.03 \times 10^{23}$ (c) $3.01 \times 10^{23}$ (d) None of these

**40.** For how many electrons of C*l*, value of magnetic quantum number m is equal to zero.

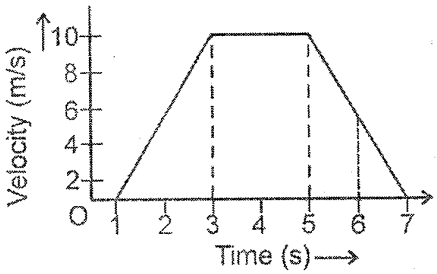
(a) 10 (b) 17 (c) 7 (d) 5

## SECTION – III
## PHYSICS

**41.** A girl swims in a swimming pool of length 100m. She swims from one end to another end and reaches the starting point again in 2 minutes the average speed of the swimmer is :

(a) 100 $ms^{-1}$ (b) 0.83 $ms^{-1}$ (c) 1.67 $ms^{-1}$ (d) zero

**42.** For the velocity time graph shown in figure the distance covered by the body in the last two seconds of its motion is what fraction of the total distance covered ?




(a) 1/2 (b) 1/4 (c) 1/3 (d) 2/3

**43.** A balloon of mass 1000 kg is floating at some height. If 100 kg mass is released from the balloon. Then the acceleration of the balloon is : [g = 10 $ms^{-2}$ ]

(a) 1.1 $ms^{-2}$ upward (b) 1.1 $ms^{-2}$ downward (c) 10 $ms^{-2}$ upward (d) 10 $ms^{-2}$ downward

**44.** A driver accelerates his car first at the rate of 2.4 $m/s^2$ and then at the rate of 1.6 $m/s^2$. The ratio of the two forces exerted by the engine in the two cases will be :

(a) 1 : 1 (b) 2 : 1 (c) 2 : 3 (d) 3 : 2

**45.** A body is whirled in a horizontal circle of radius 20 cm. It has an angular velocity of 10 rad/s. What is the linear velocity at any point on the circular path ?

(a) 10 m/s (b) 2 m/s (c) 20 m/s (d) $\sqrt{2}$ m/s

**46.** When a net force acts on an object, the object will be accelerated in the direction of the force with an acceleration proportional to the :

(a) velocity of the object (b) force on the object (c) inertia the object (d) weight of the object

**47.** A book of 10 N is placed on the table. The force exerted by the surface of the table on the book will be :

(a) 380 N (b) 10 N (c) 20 N (d) None of these

**48.** When external force acts on a system then its linear momentum will not be conserve. If only internal forces are acting on a system then the linear momentum of the system will be :

(a) conserve (b) not conserve

(c) may be conserve and not may be conserve (d) None of these

**49.** The value of G on the surface of earth is $6.67 \times 10^{-11}\ \mathrm{Nm^2/kg^2}$. Then the value of G on the surface of moon (in S.I. unit) will be-

(a) $6.67 \times 10^{-11}$ (b) $12 \times 6.67 \times 10^{-11}$ (c) $\frac{6.67}{12} \times 10^{-11}$ (d) $\frac{6.67}{6} \times 10^{-11}$

**50.** A fresh egg sinks in pure water, whereas it floats in saturated salty water. This is due to :

(a) the fluid matter inside the egg-shell

(b) higher density of the pure water

(c) higher density of the salty water

(d) the fact that the egg-shell is made of calcium which is heavier than pure water

## SECTION – IV
## BIOLOGY

**51.** Which of the following is the largest phylum ?

(a) Arthropoda (b) Annelida (c) Mollusca (d) Coelentrata

**52.** Sex organs are unicellular and non-jacketed in :-

(a) Algae (b) Bryophyta (c) Pteridophyta (d) Gymnosperms

**53.** 5-kingdom classification has given by

(a) Morgon (b) R-whittaker (c) Linnaeus (d) Haeckel

**54.** Wind causes weathering of rocks through

(a) Chemical changes (b) Abrasion (c) Mechanical forces (d) Frost action

**55.** If there were no atmosphere around the earth, the temperature of the earth will

(a) Increase (b) go on decreasing

(c) Increase during day and decrease during night (d) Be unaffected

**56.** Which of the following is known as physical basis of life ?

(a) Gene (b) Protoplasm (c) Nucleolus (d) Mitochondria

**57.** Which of the following is the largest cell organelle present in the plant cell?

(a) Mitochondria (b) Chloroplast (c) Nucleus (d) E.R.

**58.** Which muscles act involuntarily ?

(i) striated muscle (ii) smooth muscle (iii) cardiac muscle (iv) Skeletal muscle

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

**59.** Which one of the following is not a viral disease ?

(a) Dengue (b) AIDS (c) Typhoid (d) Influenza

**60.** Which of the following is natural insecticide ?

(a) Nicotine (b) Neem (c) Pyrethrum (d) All of the above

# ANSWER KEY

## MATHEMATICS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| D | C | B | C | A | D | D | D | A | A |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| D | D | A | D | D | B | B | B | C | B |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| D | B | B | A | B | A | D | A | A | A |

## CHEMISTRY

| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|---|---|---|---|---|---|---|---|---|---|
| D | C | A | B | A | B | D | B | B | A |

## PHYSICS

| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| C | B | A | D | B | B | B | A | A | C |

## BIOLOGY

| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
|---|---|---|---|---|---|---|---|---|---|
| A | A | B | B | C | B | A | B | C | D |