

TAKSHILA[®]

I N S T I T U T E

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Test Code: X-B

TNTSE SAMPLE PAPER

Takshila's National Talent Scholarship Examination

For Students of Class X

This Booklet contains 4 Pages

SCIENCE : 20 QUESTIONS

MATHEMATICS : 20 QUESTIONS

REASONING : 10 QUESTIONS

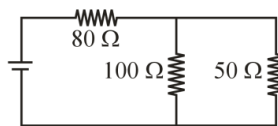
General Instructions:

Please do not write anything on question paper.

1. The candidates will use their own ball point pens, HB pencils, erasers etc.
2. Candidates will find out the right answer of the question and will darken the appropriate circle completely with Blue or Black Pen Only.
3. Total No. of Question = 50
4. All questions carry equal marks. Science, Mathematics & Reasoning are compulsory.
5. For each correct Answer = 4 marks, there is no negative marking.
6. Please bring separate sheet for Rough work.
7. Total Time : 1 Hour
8. Maximum Marks : 200

SCIENCE

Q.1 The total circuit resistance in the given figure is

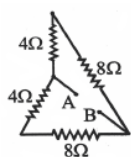


- (a) 113.3Ω (b) 131.3Ω
(c) 311.3Ω (d) 130.3Ω

Q.2 There are 8 equal resistance R. Two are connected in parallel, such four groups are connected in series. The total resistance is

- (a) R/2 (b) 2R
(c) 4R (d) 8R

Q.3 Calculate the effective resistance between A and B.



- (a) 24 Ω (b) 10 Ω
(c) 8 Ω (d) 6 Ω

Q.4 A technician has two resistance coils. By using them separately, in series or in parallel, he is able to obtain resistance of 3, 4, 12 and 16 (not in the same order). What is the resistance of the two coils?

- (a) 4 Ω , 12 Ω (b) 7 Ω , 9 Ω
(c) 5 Ω , 11 Ω (d) 6 Ω , 10 Ω

Q.5 If a copper rod carries a direct current, the magnetic field associated with the current will be

- (a) only inside the rod
(b) only outside the rod
(c) both inside and outside the rod
(d) neither inside nor outside the rod

Q.6 Energy in a current-carrying coil is stored in the form of

- (a) electric field (b) magnetic field
(c) dielectric strength (d) heat

Q.7 If the distance between two bodies is doubled, the force of attraction F between them will be

- (a) $\frac{1}{4}$ F (b) 2F
(c) $\frac{1}{2}$ F (d) F

Q.8 What is the chemical name for slaked lime ?

- (a) Calcium carbonate (b) Calcium oxide
(c) Calcium hydroxide (d) Carbon monoxide

Q.9 A balanced chemical equation is in accordance with

- (a) Avogadro's law
(b) Law of multiple proportion
(c) Law of conservation of mass
(d) Law of gaseous volumes

Q.10 Nature of SO₂ is

- (a) Basic (b) Acidic
(c) Amphoteric (d) Neutral

Q.11 What is the special name given to the 17th group?

- (a) Chalcogens (b) halogens
(c) alkali metals (d) inert gases

Q.12 If pH of a solution is 4, its [H⁺] is

- (a) 10⁻²M (b) 10⁴M
(c) 10⁻⁴M (d) 10⁻⁶M

Q.13 Aluminium oxide is :

- (a) Basic in nature
(b) Acidic in nature
(c) Amphoteric in nature
(d) None of these

Q.14 Which of the following non-metal is a good conductor of electricity?

- (a) N (b) P
(c) C (Graphite) (d) I

Q.15 The lungs are covered by two thin membranes called

- (a) Ventilator (b) Alveoli
(c) Thoracic cavity (d) Pleura

Q.16 Which one of the following is called pace maker of the heart?

- (a) SA node (b) AV node
(c) Chordae tendinae (d) AV septum

Q.17 An organism with two identical alleles of a gene in a cell is called

- (a) homozygous (b) dominant
(c) heterozygous (d) hybrid

Q.18 Mendel studied seven contrasting characters for his breeding experiment with Pisum sativum, which of the following character did he not use?

- (a) pod colour (b) pod shape
(c) leaf shape (d) plant height

Q.19 Ovaries perform the function of :

- (a) progesterone secretions
(b) oestrogen secretion
(c) ovum formation

- Q.20 (d) all of these
 _____ is the product of meiosis.
 (a) megaspore mother cell
 (b) microspore mother cell
 (c) primary endosperm nucleus
 (d) megaspore

MATHEMATICS

- Q.21 Someone is asked to make a number from 1 to 100. The probability that it is a prime is.....
 (a) $1/2$ (b) $1/3$
 (c) $1/4$ (d) $2/3$

- Q.22 If p is prime, then HCF and LCM of p and $p + 1$ would be
 (a) HCF = p , LCM = $p + 1$
 (b) HCF = $p(p + 1)$, LCM = 1
 (c) HCF = 1, LCM = $p(p + 1)$
 (d) None of the above

- Q.33 The unit place digit of HCF of $2^2 \times 3^2 \times 5^3 \times 7$, $2^3 \times 3^3 \times 5^2 \times 7^2$ and $3 \times 5 \times 7 \times 11$ is
 (a) 70 (b) 105
 (c) 175 (d) 225

- Q.34 If α, β be two zeroes of the quadratic polynomial $ax^2 + bx - c = 0$, then find the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$.

- (a) $\frac{b^2 - 2ac}{a^2}$ (b) $\frac{3abc - b^3}{c^3}$
 (c) $\frac{3abc - b^3}{a^2c}$ (d) $\frac{b^3 + 3abc}{a^2c}$

- Q.35 The value of $\frac{a + \sqrt{a^2 - b^2}}{a - \sqrt{a^2 - b^2}} + \frac{a - \sqrt{a^2 - b^2}}{a + \sqrt{a^2 - b^2}}$ is.....

- (a) $\frac{a^2}{b^2}$ (b) $\frac{b^2}{a^2}$
 (c) $\frac{a}{b}$ (d) $\frac{2(2a^2 - b^2)}{b^2}$

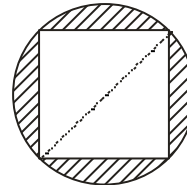
- Q.36 Find the sum of first 20 terms of an A.P. whose n th term is given by $T_n = (7 - 3n)$
 (a) 382 (b) -490
 (c) 420 (d) -382

- Q.27 The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. The area of the sector is
 (a) 15.1 cm^2 (b) 15.5 cm^2

- (c) 15.6 cm^2 (d) 15.9 cm^2

- Q.28 In a circle of radius 42 cm, an arc subtends an angle of 60° at the centre. Then, the length of the arc is
 (a) 44 cm (b) 24 cm
 (c) 48 cm (d) 46 cm

- Q.29 In figure, a square of diagonal 8 cm is inscribed in a circle, then the area of the shaded region is



- (a) $(32\pi - 16)\text{cm}^2$ (b) $(16\pi - 32)\text{cm}^2$
 (c) $(11\pi - 32)\text{cm}^2$ (d) $(16\pi - 64)\text{cm}^2$

- Q.30 If $x = r \sin A \cos B$, $y = r \sin A \sin B$ and $z = r \cos A$, then the value of $x^2 + y^2 + z^2$ is

- (a) $\frac{r^2}{2}$ (b) r^2
 (c) $r^2 - 1$ (d) $r^2 + 1$

- Q.31 If $\sqrt{3} \tan \theta = 2 \sin \theta$, then the value $\sin^2 \theta - \cos^2 \theta$ is

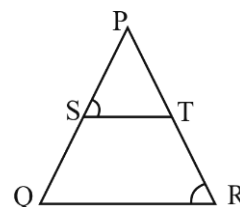
- (a) $1/2$ (b) $-1/2$
 (c) $3/2$ (d) $-3/2$

- Q.32 In a ΔPQR , $\angle Q = 90^\circ$. If $PQ = 10$ cm and $PR = 15$ cm. Then, the value of $\tan^2 P + \sec^2 P + 1$ is

- (a) $5/2$ (b) $3/17$
 (c) $9/2$ (d) $4/5$

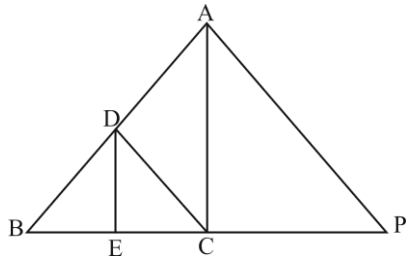
- Q.33 In the adjoining figure,

$\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Then ΔPQR is an



- (a) equilateral triangle
 (b) right angle triangle
 (c) isosceles triangle
 (d) Cannot say

- Q.34 In the given figure of $\triangle ABC$, $DE \parallel AC$. If $DC \parallel AP$, where point P lies on BC produced, then $\frac{BE}{EC} =$



- (a) $\frac{BD}{CP}$ (b) $\frac{BC}{CP}$
 (c) $\frac{BC}{DA}$ (d) None of these
- Q.35 The ratio in which the point P (m, 6) divides the join A (-4, 3) and B(2, 8) is
 (a) 2 : 3 (b) 1 : 2
 (c) 3 : 2 (d) 2 : 1
- Q.36 If P (9a - 2, -b) divides line segment joining A(3a + 1, -3) and B(8a, 5) in the ratio 3 : 1, then the values of a and b is
 (a) a = -1, b = 3 (b) a = -1, b = -3
 (c) a = 0, b = 0 (d) a = 1, b = -3
- Q.37 One equation of a pair of dependent linear equations is $-5x + 7y - 2 = 0$. The second equation can be
 (a) $10x + 14y + 4 = 0$ (b) $-10x - 14y + 4 = 0$
 (c) $-10x + 14y + 4 = 0$ (d) $10x - 14y + 4 = 0$
- Q.38 A fraction becomes $\frac{4}{5}$, if 2 is added to both numerator and denominator, if however 4 is subtracted from both numerator and denominator, then the fraction becomes $\frac{1}{2}$. The algebraical representation of situation is
 (a) $5x - 4y + 2 = 0, x - y = 0$
 (b) $5x - 4y + 2 = 0, 2x - y - 4 = 0$
 (c) $x + 4y = 0, y + 2x = 0$
 (d) None of the above
- Q.39 The value of x and y in $\frac{5}{x+1} - \frac{2}{y-1} = \frac{1}{2}$; $\frac{10}{x+1} + \frac{2}{y-1} = \frac{5}{2}$, $x \neq -1$ and $y \neq 1$, is
 (a) x = 4, y = 5 (b) x = 5, y = 4
 (c) $x = \frac{1}{4}, y = \frac{1}{5}$ (d) None of these

- Q.40) Two dice are rolled once. Then the probability of getting such numbers on the two dice, whose product is 12 is
 (a) $\frac{1}{9}$ (b) $\frac{2}{9}$
 (c) $\frac{4}{9}$ (d) $\frac{5}{9}$

REASONING

- Q.41 Nisha was born on 30 January. Reshama is older than Nisha by 21 days. During that year, the Republic day was celebrated on Wednesday. On which day was Reshma born?
 (a) Sunday (b) Monday
 (c) Tuesday (d) Friday
- Q.42 Find the missing number from the given option
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- (a) 95 (b) 108
 (c) 120 (d) 143
- Q.43 Inspector Jatin travelled from his police station for 400 metres. He then turned left and travelled 500 metres straight after which he turned left again and travelled for 400 metres straight. He then turned right and walked for another 600 metres straight. How far is he from the Police station?
 (a) 1.0 km (b) 1.1 km
 (c) 1.4 km (d) 1.8 km
- Q.44 If in a certain language TEN is called 72, MEN is called 65, then HEN is called ?
 (a) 52 (b) 68
 (c) 60 (d) 62

Directions (Q. 45 to Q.49) : Read the following information to answer these questions Consider a group comprising of four students – Reena, Beena, Neena and Meena, who stand in a row. Reena and Beena stand in 6th and 7th position respectively from the left. Meena and Neena stand in 4th and 5th position respectively from the right. When Beena and Meena exchange their positions then, Beena will be 15th from the left.

- Q.45 Originally, Neena's position from the left is
 (a) 5 (b) 13
 (c) 14 (d) None of these
- Q.46 Reena's position from the right is
 (a) 6 (b) 13
 (c) 18 (d) None of these

<p>Q.47 If Neena and Reena also exchange their positions between themselves, then after the exchange, Neena's position from the left will be (a) 6 (b) 10 (c) 11 (d) None of these</p> <p>Q.48 After exchange of positions between Beena and Meena, Meena's position from the right is (a) 5 (b) 10 (c) 12 (d) 7</p> <p>Q.49 A postman was returning to the post office which was in front of him to the north. When the post office was 100 meters away from him, he turned to the left and moved 50 meters to deliver the last letter at Shantivilla. He then moved in the same direction</p>	<p>for 40 meters, turned to his right and moved 100 meters. How many meters was he away from the post office (a) 0 (b) 90 (c) 150 (d) 100</p> <p>Q.50 In a row Manoj is last but second. Ramesh is standing before him after three students. Suresh is standing on 7th place before Ramesh. The place of suresh is 5th in a row, so what is the total No. of students in a row. (a) 13 (b) 16 (c) 14 (d) 17</p>
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