



SMARTPREP

ACADEMY

SAMPLE PAPER

Scholarship Cum Admission Test

PRESENTLY STUDYING IN CLASS - 10th

ENGINEERING

IMPORTANT INSTRUCTIONS

1. Duration of Test is 2 **Hours** and Question paper Contains **60 Questions**. The **Max. Marks are 240**.
2. Student cannot use log tables and calculators or any other material in the examination hall.
3. Student must abide by the instructions issued during the examination, by the invigilators or the centre in charge.
4. Each correct answer carries **4 marks** and **1 marks** will be deducted for incorrect response of each question

NAME :- _____ SCHOOL _____

SCIENCE

1. A sheet of paper is placed on a table and a jug full of water is kept on it while pulling the paper suddenly, it is observed that the water does not spill out of jug. It is due to the inertia of the
(A) paper sheet (B) jug & water in it (C) hard surface (D) table
2. "Every Action has equal & opposite reaction" was discovered by
(A) Pascal (B) Newton (C) Edison (D) Copernicus
3. If a car travels a distance of 100km & it takes 25 minutes to reach its destination, the speed of the car is
(A) 4 km/min (B) 4 mt/min (C) 400 mt/min (D) None of these
4. A 1500 w electric geyser used every day for 2 hrs. Calculate the energy consumed in the month of April?
(A) 90 kwh (B) 30 kwh (C) 750 Kwh (D) None of these
5. The instrument for measuring electric current is known as
(A) Ammeter (B) Voltmeter (C) Galvanometer (D) Chromometer
6. A person using convex lens must be suffering from
(A) Myopia (B) Astigmatism (C) Hypermyopia (D) None of these
7. The mass of an object is 10 Kg on earth, So we can say-
(A) Its weight on earth is 10 N. (B) Its weight on earth is 1.67 N.
(C) Its weight on moon is 10 N. (D) Its mass on moon is 10 Kg.
8. You are provided with a concave lens having focal length 15 cm. If it diminishes the image by one-third, calculate the distance of image from lens?
(A) 5 cm (B) 10 cm (C) 5 m (D) 10 m
9. Calculate the electricity bill for 30 days of a house in which a bulb 100 W operates for 6 hours/day, a fan rated 80 W operates for 10 hours/day and a refrigerator rated 400 W operates for 24 hours/day. Assume the cost of energy is Rs 8.00 per kWh.
(A) Rs 26.40 (B) Rs 264.00 (C) Rs 2640.00 (D) Rs 26400.00
10. Choose the material most suitable for the core of electromagnets
(A) air (B) soft iron (C) wood (D) steel

Rough Work

11. Atom that can neither gain nor lose electrons is said to be
(A) Inert (B) Reactive (C) Metallic (D) Non-metallic
12. Which one of the following is known as “king of Chemicals”
(A) Hydrochloric acid (B) Sulphuric acid (C) Nitric acid (D) Phosphoric acid
13. The common gas used in our refrigerator
(A) marsh gas (B) producer gas (C) freon (D) Water gas
14. Alum is added with muddy water to
(A) Kill bacteria (B) Make filtration of milk
(C) Make the sedimentation process quick (D) None of these
15. To protect the metal from corrosion it is some times coated with a thin layer of Al_2O_3 (Aluminium oxide) and the process is called
(A) Electroplating (B) Electroforming (C) Aluminizing (D) None of these
16. When two liquids in a mixture differ by their boiling points, which of the following is the best method to separate these liquids?
(A) Evaporation (B) Distillation (C) Chromatography (D) Filtration
17. Which of the following is a chemical change?
(A) Melting of ice (B) Dissolving salt in water
(C) Rusting of iron (D) Boiling of water into steam
18. The gas used in welding and cutting metal is-
(A) Ethyne (B) Ethene (C) Ethane (D) Propane
19. When a burning splinter is brought near the gas jar containing hydrogen gas, a popping sound is observed. It is because the reaction is
(A) exothermic (B) endothermic (C) exothermic and endothermic (D) None of these
20. When copper sulphate solution reacts with iron metal, copper metal is formed. This reaction comes under which of the following category?
(A) Decomposition reaction (B) Single displacement reaction
(C) Double displacement reaction (D) Combination reaction

Rough Work

MATHEMATICS

21. The factorisation of

$$2p(a - b) + 3q(5a - 5b) + 4r(2b - 2a) \text{ yields}$$

(A) $(b - a)(2p + 15q - 8r)$

(B) $(a - b)(2p + 15q - 8r)$

(C) $(b - a)(2p - 15q + 8r)$

(D) $(a - b)(2p - 15q + 8r)$

22. The sides of a triangle are 11 m, 60 m and 61 m. The altitude of the smallest side is -

(A) 11 m

(B) 66 m

(C) 60 m

(D) 50 m

23. If $x = \frac{(\sqrt{3} + 1)}{2}$, then the value of $4x^3 + 2x^2 - 8x + 7$ is

(A) 8

(B) 10

(C) 15

(D) 14

24. The volume (in cm^3) of the largest right circular cone that can be cut off from a cube of edge 4.2 cm is -

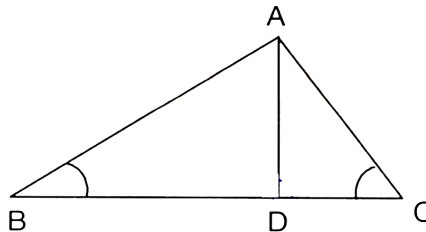
(A) 9.7

(B) 77.6

(C) 58.2

(D) 19.4

25. In a given fig., if $AD = 7\sqrt{3}$; $\angle B = 30^\circ$, $\angle ADC = 90^\circ$, and $\angle C = 60^\circ$ then BC equals to -



(A) 14 m

(B) 27 m

(C) 29 m

(D) 28 m

Rough Work

26. The value of $(1 + \cot \theta - \operatorname{cosec} \theta) \cdot (1 + \tan \theta + \sec \theta)$ is
(A) -2 (B) 3 (C) 2 (D) 1
27. If the p^{th} term of an AP is q and the q^{th} term is p , then the n^{th} term is
(A) $p + q - n$ (B) $p + q + n$ (C) $p - q - n$ (D) $q - p - n$
28. If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then the value of p is -
(A) 4 (B) ± 4 (C) -4 (D) 0
29. The probability of guessing the correct answer to a certain test question is $\frac{x}{12}$. If the probability of not guessing the correct answer is $\frac{2}{3}$, then x is equal to -
(A) 2 (B) 3 (C) 4 (D) 6
30. In a flight of 600 Km an aeroplane was slowed down due to a bad weather. If the average speed for the trip was reduced by 200 Km/h and the time of flight increased by 30 minutes, then the duration of flight is -
(A) 1 hr (B) 2 hrs (C) 3 hrs (D) 4 hrs
31. If, $x + \frac{1}{y} = 1$ and $y - \frac{1}{z} = 1$, then the value of xyz is
(A) 1 (B) -1 (C) 0 (D) -2
32. The difference between a discount of 40% of Rs.1000 and two successive discount of 30% and 10% on the same amount is
(A) 0 (B) 20 (C) 30 (D) 40
33. Each side of an equilateral triangle is a cm. Find out the ratio of areas of the circumcircle and the incircle of the triangle
(A) 1 : 2 (B) 2 : 1 (C) 4 : 1 (D) 1 : 4

Rough Work

34. Find out the value of $\sqrt{\sec^2 \theta + \operatorname{cosec}^2 \theta}$
- (A) $\tan \theta + \cot \theta$ (B) $\sec \theta + \operatorname{cosec} \theta$ (C) $\frac{\sec^2 \theta}{\operatorname{cosec}^2 \theta}$ (D) $\tan \theta - \sec \theta$
35. A copper wire of certain length is turned into a square first and then into a circle. Which one of them has larger area ?
- (A) square (B) circle (C) both of them are equal (D) none of the above
36. If $x^2 + y^2 + 10 = (2\sqrt{2}x + 4\sqrt{2}y)$ then the value of $(x + y)$ is
- (A) $4\sqrt{2}$ (B) $3\sqrt{2}$ (C) $6\sqrt{2}$ (D) $9\sqrt{2}$
37. The height of a cone is 30 cm. A small cone is cut off by a plane parallel to its base. If its volume be $\frac{1}{27}$ th of the volume of the given cone, at what height above the base is the section cut?
- (A) 21 cm (B) 20.5 cm (C) 18 cm (D) 20 cm
38. Circumference of a circle is S cm. and its area is A sq.cm. which one of the following relations is true?
- (A) $\pi S^2 > 4A$ (B) $S^2 < 2\pi A$ (C) $S = 4\pi A$ (D) $S^2 = 4\pi A$
39. If, $\tan 9^\circ = \frac{x}{y}$ then, the value of $\frac{\sec^2 81^\circ}{1 + \cot^2 81^\circ}$ is
- (A) $\frac{x^3}{y^3}$ (B) $\frac{x^4}{y^4}$ (C) $\frac{x^5}{y^5}$ (D) $\frac{y^2}{x^2}$
40. If $x^2 - 6x + 5 < 0$, then real values of x satisfies
- (A) $1 < x < 5$ (B) $3 < x < 7$ (C) $4 < x < 5$ (D) $7 < x < 10$

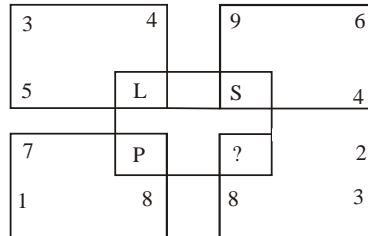
Rough Work

MENTAL ABILITY

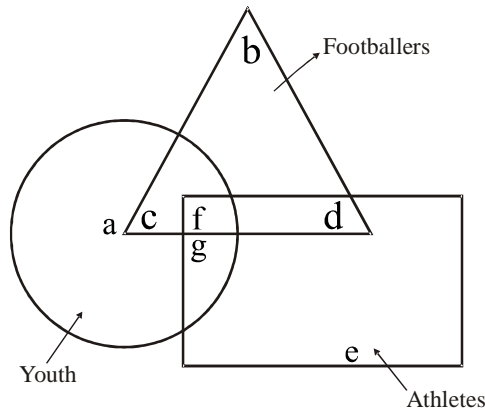
41. Engineer : Machine :: ?
(A) Doctor : Disease (B) Doctor : Medicine (C) Doctor : Hospital (D) Doctor : Body
42. A person took a loan of Rs 1500 from his employer for 3 months at 12% per annum simple interest. The amount he has to return is
(A) Rs 45 (B) Rs 1500 (C) Rs 1545 (D) Rs 1455
43. A wholesaler allows a discount of 20% on the list price to a retailer. The retailer sells at 8% discount on the list price. The profit percent of the retailer is
(A) 20% (B) 15% (C) 12% (D) 8%
44. A can complete a piece of work in 12 days and B is 60% more efficient than A. In how many days B will complete the same work?
(A) 5 Days (B) 7.5 Days (C) 6 Days (D) 8 Days
45. A, B & C can complete a piece of work in 6, 12 and 24 days, respectively, Working together, they will complete the same work in
(A) $1/24$ Days (B) $7/24$ Days (C) $24/7$ Days (D) 4 Days
46. Find the next number in the sequence 0, 2, 24, 252, ____
(A) 620 (B) 1040 (C) 3120 (D) 5430
47. The average age of three persons is 27 years. Their ages are in the proportion of 1:3:5. What is the age in years of the youngest one among them.
(A) 10 (B) 12 (C) 9 (D) 8
48. D-4, F-6, H-8, J-10, ?
(A) M-14 (B) K-13 (C) L-12 (D) S-21

Rough Work

49. AB, BA, ABD, DBA, PQRS, ?
 (A) SRQP (B) OYRB (C) RPOS (D) SXRG
50. 25, 49, 89, 145, 217, ?
 (A) 305 (B) 327 (C) 309 (D) 303
51. Find the letter to be placed in '?' of the figure given.



- (A) Q (B) N (C) M (D) R
52. In the figure, the circle represents youth, the triangle represents footballers and the rectangle represents athletes. Which letter(s) represent(s) athletes among youths who are not footballers?



- (A) g (B) g and c (C) f (D) f and d

Rough Work

53. Amongst five friends, Lata, Alka, Rani, Asha and Sadhana, Lata is older than only three of her friends. Alka is younger to Asha and Lata. Rani is older than only Sadhana. Who amongst them is the eldest ?
- (A) Alka (B) Lata (C) Asha (D) Sadhana
54. Mother was asked how many gifts she had in the bag. She replied that there were all dolls but six, all cars but six, and all books but six. How many gifts had she in all ?
- (A) 9 (B) 18 (C) 27 (D) 36
55. In a certain code, MONKEY is written as XDJMNL. How is TIGER written in that code ?
- (A) QDFHS (B) SDFHS (C) SHFDQ (D) UJHFS

Question 56-57: Answer the questions based on the following information.

Six men R, S, T, U, V and W sat around circular table playing cards. It was noticed that no two men, the initial letters of whose names are adjacent in the alphabetical order, sat next to each other. U was opposite of R. V was not to the immediate right of R.

56. Who sat to the immediate left of R ?
- (A) S (B) T (C) V (D) W
57. Who sat to the immediate right of R ?
- (A) S (B) T (C) V (D) W
58. I am facing South. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point ?
- (A) North (B) North west (C) East (D) North east
59. A walks 10 metres towards East and then 10 meters to his right. Then every time turning to his left, he walks 5, 15 and 15 meters respectively. How far is he now from his starting point?
- (A) 5 meters (B) 10 meters (C) 15 meters (D) 20 meters
60. Heart : Blood : : Lung : ?
- (A) Oxygen (B) Chest (C) Purification (D) Air

Rough Work

OUR TOP PERFORMERS

IIT - JEE / NEET



JEE MAIN - 2022
Rank - 1
BOKARO TOPPER

AIR 261

ARVIND KR. SHARMA
4-Years Arete Batch

AIR 1736*

RAVI KR. VERMA
2-Year Classroom Program



AIR 4076*

KUMAR SUBIGYA



AIR 5401*

ROSMAN KR. GUPTA
2-Year Classroom Program



93.6
Percentile

RAVI ADITYA
2-Year Classroom Program



94.45
Percentile

SNEHA
2-Year Classroom Program



93.5
Percentile

KUMAR ARPIT
2-Year Classroom Program



and 30+ Students scored above 90%ile

AIR-11 JEE MAIN - 2021

AIR-76 JEE Advanced - 2021 (OBC)

AIR-981 KVPY



JEE MAIN (2021)

KUMAR SATYADARSHI



NEET (2021)

SUDHANSHU KESHRI

621 / 720

RESULTS

NEET (2021)



620
720

SALONI SINGH



606
720

ARYAN RAJ



604
720

GUDIA SINGH



603
720

PAWANI BHARDWAJ



596
720

SRISHTI KUMARI



563
720

SUDHANSHU RAJ



563
720

SUMANTOSH



540
720

ANKITA MUKHERJEE

JEE ADVANCED (2021)



AIR 2701
(OBC - 411)

ROHIT RAJ



AIR 3413

SATYAJEET



AIR 6642

ABHISHEK

JEE ADVANCED (2020)



IIT MADRAS
563

ULLAS KUMAR MANDAL



IIT KHARAGPUR
2675

AKASH ARYAN



IIT KANPUR
5977

SWETA KUMARI



IIT DELHI
596

SURBHI KHARAKIYA

JEE MAIN (2021)

12th BOARD (2020)



CBSE **96.6%**

SWETA KUMARI



CBSE **96.4%**

NAINCY GHIRIA



CBSE **96.2%**

M.K. BHASKAR



CBSE **95.8%**

JYOTI KUMARI



CBSE **95.4%**

NISHA RANJAN



CBSE **95.4%**

ULLAS KR. MANDAL



CBSE **95%**

MOHINI



AIR 1034
(OBC - 411)

ROHIT RAJ



AIR 1682

SATYAJEET



AIR 4591

ADITYA



AIR 5715

ABHISHEK

60+ Selections in JEE Main.

12th BOARD (2022)



CBSE **97.8%**

JYOTSANA KUMARI



CBSE **96.4%**
MATHEMATICS
100/100

ARVIND KR. SHARMA



CBSE **95.6%**

RAVI ADITYA



CBSE **95.4%**

ANSHIKA



CBSE **92.6%**

RAVI VERMA



CBSE **91%**

KUMAR ARPIT



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