JEE MAIN DIVISION

VIBRANT ACADEMY

(India) Private Limited

B-41, Road No.2, Indraprastha Industrial Area, Kota-324005 (Raj.)
Tel. : 06377791915, (0744) 2778899, Fax : (0744) 2423405
Email: admin@vibrantacademy.com **Website : www.vibrantacademy.com**

SAMPLE PAPER

SEAT (SCHOLARSHIP CUM EARLY ADMISSION TEST)

X TO XI MOVING (PEARL COURSE)

Time : 1 Hours **Maximum Marks : 200**

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

INSTRUCTIONS

A. General :

1. This booklet is your Question Paper containing **50** questions. The booklet has **24** pages.
2. The **question paper CODE** is printed on the right hand top corner of this sheet and on the back page (page no. **24**) of this booklet.
3. The question paper contains **2** blank pages for your rough work. No additional sheets will be provided for rough work.
4. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed to be carried inside the examination hall.
5. Fill in the boxes provided below on this page and also write your **Name** and **Regn. No.** in the space provided on the back page (page no. **24**) of this booklet.
6. The answer sheet, a machine-readable Objective Response Sheet (**ORS**), is provided separately.
7. DO NOT TAMPER WITH / MUTILATE THE ORS OR THE BOOKLET.
8. Do not open the question-paper booklet before being instructed to do so by the invigilators.

B. Question paper format

C. Marking scheme

Read the instructions printed on the back page (page no. **24**) of this booklet.

Name of the candidate

UID Number

I have read all the instructions and shall abide by them.

.....
Signature of the Candidate

I have verified all the information filled in by the candidate.

.....
Signature of the invigilator

USEFUL DATA

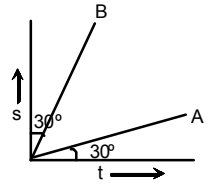
Atomic weights: Al = 27, Mg = 24, Cu = 63.5, Mn = 55, Cl = 35.5, O = 16, H = 1, P = 31, Ag = 108, N = 14, Li = 7, I = 127, Cr = 52, K=39, S = 32, Na = 23, C = 12, Br = 80, Fe = 56, Ca = 40, Zn = 65.5, Ti = 48, Ba = 137, U = 238, Co= 59, B =11, F = 19, He = 4, Ne = 20, Ar = 40 , Mo = 96, g = 10 m/s^2

PART I : PHYSICS

Single Correct Choice Type

This section contains 10 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

1. The displacement (s) and time (t) graphs for two moving objects A and B are straight lines inclined at 30° with the time axis and 30° with the displacement axis respectively. Then what would be their velocity ratio (v_A / v_B) ?



(1) 1/3 (2) 1/2 (3) 1/4 (4) 3

2. A stone fell from the top of a tower to the ground In 8 seconds. How much time did it take to cover the first quarter of the distance starting from the top?

(1) 4 seconds (2) 5 seconds (3) 6 seconds (4) 8 seconds

3. If the kinetic energy of a body increases by 300%, by what percent shall the linear momentum of the body Increase?

(1) 200% (2) 100% (3) 150%. (4) 300%

4. When a stone is freely dropped into a well of depth 45m; the sound of its o ' splash is heard after 3.125 second. Then what Is the value of the speed of sound in air? ($g = 10\ m/s^2$)

(1) 360 m/s (2) 330 m/s (3) 340 m/s (4) 332 m/s.

5. An ice-cube of density 900 kg/m^3 Is floating in water of density 1000 kg/m^3. The percentage of volume of ice cube outside the water is;

(1) 20% (2) 35% (3) 10% (4) 25%

6. A conducting wire of certain length has its resistance R_1 When it is stretched to have its diameter reduced to half its original value, what would be its new resistance R_2 in comparison to R_1?

(1) $R_2 = 16\ R_1$ (2) $R_2 = 8\ R_1$ (3) $R = A\ R_1$ (4) $R = 2\ R_1$

7. An n-particle projected towards west is deflected towards north by a magnetic field. Then the direction of the magnetic field is towards

(1) South (2) East (3) Downward (4) Upward

8. A standard 100W electric bulb in parallel with a heater is connected across the mains. If the 100 W bulb is now replaced by a 200W bulb; the power output of the heater;

(1) will be halved (2) will increase 4 times

(3) will increase 2 times (4) will remain same.

9. The refractive index of diamond with respect to glass is 1.6 and absolute refractive index of glass is 1.5. Then the absolute refractive index of diamond will be;

(1) 2.5 (2) 2.4 (3) 3 (4) 3.5

10. Two thin lenses of focal lengths f_1 and f_2 are placed in contact with each other such that the combination behaves as a glass slab. Then how are f_1 and f_2 related to each other?

(1) $f_1 = \frac{1}{f_2}$ (2) $f_2 = -f_1$ (3) $f_1 = f_2$ (4) $f_1 = \sqrt{f_2}$

PART II : CHEMISTRY

Single Correct Choice Type

This section contains 10 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

11. The solution of acid and base are ……. of electricity :
(1) non-conductor (2) conductor
(3) Semi conductor (4) Not affected

12. Hydrocarbon tail in micelle formation is found :
(1) inside (2) outside
(3) no change (4) along any side

13. The substance which loses electron is called :
(1) oxidant (2) catalyst
(3) reductant (4) None of these

14. The Modern periodic table is based on which property :
(1) atomic structure (2) Atomic weight
(3) Atomic number (4) Valency

15. The energy required to remove an electron from a neutral atom is called :
(1) Electron gain enthalpy
(2) electronegativity
(3) Ionisation enthalpy
(4) Excited energy

16. The molecular formula of Freon-11 is
(1) $CFCl_3$ (2) $C_2F_{21}Cl_4$
(3) CF_2Cl_2 (4) C_2F_4Cl

17. The natural rubber is heated with sulphur to increase its property and tensile strength. This process is called :
(1) Polymerisation (2) Saponification
(3) Vulcanization (4) Simplization

18. The reaction, which is catalysed by product formed, is called :
(1) bio chemical (2) reversible
(3) auto catalysed (4) irreversible

19. When did Maharishi Kanad give the information about atom?
(1) before 500 BCE (2) before 100 BCE
(3) before 460 BCE (4) before 1808 BCE

20. Which of the following is a mixture?
(1) Water (2) Brass
(3) Iron (4) Salt

PART III : MATHEMATICS

Single Correct Choice Type

This section contains 20 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

21. The price of copper rose by 25 per cent and then fell by 20 per cent. The price after these changes was

(1) 20 per cent greater than the original price (2) 5 per cent greater than the original price

(3) the same as the original price (4) 5 per cent less than the original

22. A contract is to be completed in 46 days and 117 men were set to work, each working 8 hours a day. After 33 days 4/7 of the work is completed. How many additional men may be employed so that the work may be completed in time, each man now working 9 hours a day ?

(1) 80 (2) 81 (3) 82 (4) 83

23. A cricket club has 15 members, of whom only 5 can bowl. If the names of the 15 members are put into a box and 11 drawn at random, then the chance of obtaining an eleven containing at least 3 bowlers is

(1) 7/13 (2) 6/13 (3) 11/15 (4) 12/13

24. There are two temples, one on each bank of a river, just opposite to each other. One temple is 54m high. From the top of this temple, the angles of depression of the top and the foot of the other temple are 30° and 60° respectively. Find the width of the river and the height of the other temple.

(1) 30.16 m width, 16 m height (2) 31.17 m width, 36 m height

(3) 32.18 m width, 14 m height (4) 28.20 m width. 22 m height

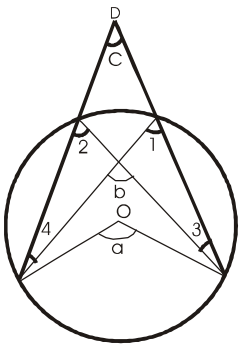
25. The sum of the 6th and 15th elements of an arithmetic progression is equal to the sum of 7th, 10th and 12th elements of the same progression. Which element of the series should necessarily be equal to zero?

(1) 10^{th} (2) 8^{th} (3) 1^{st} (4) None of these

26. If d is the H.C.F. of 56 and 72, then find mn satisfying d = 56m + 72n :

(1) 12 (2) 16 (3) – 12 (4) – 16

27. O is the centre of the circle in the figure given below. The correct relationship between a, b and c is



(1) a + b = c (2) a = b + c

(3) a + c = b (4) None of these

28. If $a^x = b$, $b^y = c$ and $c^z = a$, then the value of $x^2y^2z^2$ is.....

(1) $a^2b^2c^2$ (2) 1 (3) 4 (4) $\frac{1}{a^2b^2c^2}$

29. The length of the sides of a triangle are $3x + 2y$, $4x + \frac{4}{3}y$ and $3(x + 1) + \frac{3}{2}(y - 1)$. If the triangle is equilateral, then its side is

(1) 8 (2) 10 (3) 12 (4) 16

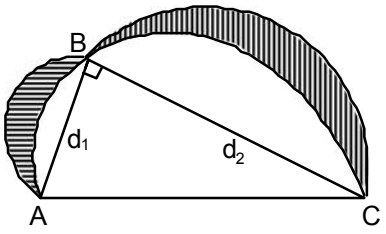
30. If $x^2 - ax + b = 0$ and $x^2 - px + q = 0$ have a roots is common and the second equation has equal roots, the

(1) $b + q = 2ap$ (2) $b + q = \frac{ap}{2}$ (3) $b + q = ap$ (4) none of these

31. Eighteen men take 30 days to complete a piece of work working 10 hours a day. Find the time taken by 25 men to complete five times as much work working 12 hours a day.

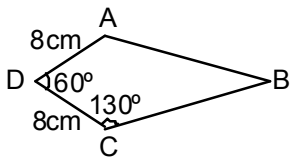
(1) 30 days (2) 36 days (3) 72 days (4) 90 days

32. In the figure below, B is point on the semicircle with diameter AC. Semicircles are constructed with AB and BC as diameters with $AB = d_1$ and $BC = d_2$. Find the ratio of the shaded area to the area of the triangle ABC.



(1) 1 : 2 (2) 22 : 21 (3) 1 : 1 (4) Cannot be determined

33. In the kite ABCD, AD = CD = 8 cm, $\angle ADC = 60^\circ$, $\angle DCB = 130^\circ$ and AB = CB. Find $\angle ABC$.



(1) 50° (2) 40° (3) 60° (4) 25°

34. Find the mode of the given data:

Classes	Frequencies
10–15	30
15–20	45
20–25	75
25–30	35
30–35	25
35–40	15
Total	**225**

(1) 22.89 (2) 15.68 (3) 20.35 (4) 22.14

35. Without using trigonometric tables, evaluate the following :

$$\frac{\cos^2 20^\circ + \cos^2 70^\circ}{\sec^2 50^\circ - \cot^2 40^\circ} + 2\,\text{cosec}^2\,58^\circ - 2\cot 58^\circ \tan 32^\circ - 4\tan 13^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$$

(1) 1 (2) 2 (3) –1 (4) –2

36. If y = 1 is a common root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then ab equals

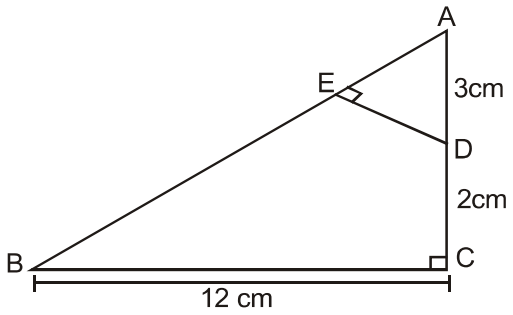
(1) 3 (2) –7/2 (3) 6 (4) –3

37. The length of the shadow of a tower standing on level ground is found to be 2x metres longer when the sun's elevation is 30º than when it was 45º. The height of the tower in metres is :

(1) $(\sqrt{3}+1)x$ (2) $(\sqrt{3}-1)x$

(3) $2\sqrt{3}x$ (4) $3\sqrt{2}x$

38. ΔABC is right angled at C and $DE \perp AB$. Find the length of AE =



(1) $\frac{13}{36}$cm (2) $\frac{15}{13}$cm

(3) $\frac{13}{15}$cm (4) $\frac{36}{13}$cm

39. In an AP, $S_p = q$, $S_q = p$ and S_r denotes the sum of first r terms. Then, S_{p+q} is equal to

(1) 0 (2) –(p + q)

(3) p + q (4) pq

40. Two dice are rolled simultaneoulsy. The probability that they show different faces is :

(1) $\frac{2}{3}$ (2) $\frac{1}{6}$

(3) $\frac{1}{3}$ (4) $\frac{5}{6}$

PART IV : MENTAL ABILITY

Single Correct Choice Type

This section contains 10 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

Directions (Q. 41 to Q. 43) : Find the missing terms :

41. 0, 5, 22, 57, 116, ?

(1) 205 (2) 247

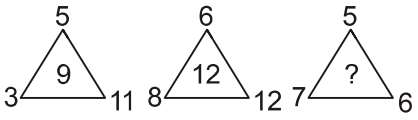
(3) 289 (4) 324

42. LRX, DJP, VBH, NTZ, ?

(1) ELS (2) FMR

(3) GKS (4) FLR

43.



(1) 12 (2) 9 (3) 8 (4) 6

44. In a certain code **HINDU** is written as **61257**, **MAN** is written as **924** then the word **INDIRA** will be coded as

(1) 454626 (2) 594921

(3) 452787 (4) 884572

45. A postman was returning to the post office which was in front of him to the North. When the post office was 100 metres away from him, he turned to the left and moved 50 metres to deliver the last letter at shantivilla. He then moved in the same direction for 40 metres, turned to his right and moved 100 metres. How many metres was he away from the post office ?

(1) 0 (2) 90 (3) 150 (4) 100

46. Showing the lady in the park, Vineet said, "She is the daughter of my grand father's only son. "How is Vineet related to that lady?

(1) Brother (2) Cousin

(3) Father (4) Uncle

47. In the month of Oct. in a year has exactly four Mondays and four Fridays. Find what day of week will be on the 20th of Nov. of that year?

(1) Wednesday (2) Thursday

(3) Tuesday (4) Monday

48. The value of $1001 \div 11 \div 13$ is :

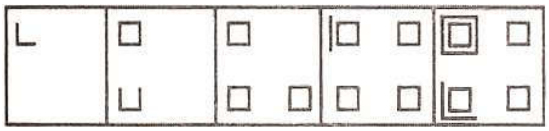
(1) 7 (2) 91 (3) 143 (4) 49

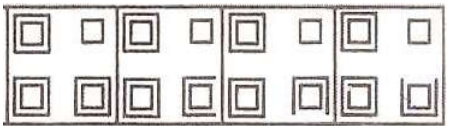
49. If it is possible to make a meaningful word with the third, the fourth and the eleventh letters of the word **CONTROVERSIAL**, which of the following will be the last letter of that word ? If more than one such words can be made, give **M** as the answer and if no such word is there, give **X** as the answer.

(1) S (2) I (3) X (4) M

Direction (Q. 50) : In each of the following, there are some figure which have some particular series. Find out the next.

50.





(1) (2) (3) (4)

Name of the candidate

UID Number

B. Question paper format :

9. The question paper consists of 4 parts (Physics, Chemistry, Mathematics and Mental).

C. Marking Scheme :

10. For each question, you will be **awarded 4 marks** if you darken the bubble corresponding to the correct answer and **zero mark** if no bubble is darkened. In case of bubbling of incorrect answer, **minus one (–1) mark** will be awarded.

ANSWER KEY

1.	1	**2.**	1	**3.**	2	**4.**	1	**5.**	3	**6.**	1	**7.**	4
8.	4	**9.**	2	**10.**	2	**11.**	2	**12.**	2	**13.**	3	**14.**	3
15.	3	**16.**	1	**17.**	3	**18.**	3	**19.**	1	**20.**	2	**21.**	3
22.	2	**23.**	4	**24.**	2	**25.**	2	**26.**	3	**27.**	2	**28.**	2
29.	3	**30.**	2	**31.**	4	**32.**	3	**33.**	2	**34.**	4	**35.**	3
36.	1	**37.**	1	**38.**	2	**39.**	2	**40.**	4	**41.**	1	**42.**	4
43.	3	**44.**	3	**45.**	2	**46.**	1	**47.**	1	**48.**	1	**49.**	4
50.	4												