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 (MICRO 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   Read the instructions printed on the back page

C.   Marking scheme   (page no. **24**) of this booklet.

Name of the candidate   **UID Number**

I have read all the instructions and shall abide by them.	I have verified all the information filled in by the candidate.
.... **Signature of 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, $g = 10 \text{ m/s}^2$

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. If an object is moving along a straight line then
(A) Magnitude of the displacement will be equal the distance
(B) Magnitude of the displacement may be equal the distance
(C) Magnitude of the displacement will be greater than the distance
(D) Magnitude of the displacement will be less than the distance

2. It a body is moving along a curved path of radius 'r' and angular velocity 'ω' then linear velocity of body is given by

(A) $\omega^2 r$ (B) $\dfrac{\omega^2}{r}$ (C) ωr (D) $\omega^2 r$

3. A monochromatic light ray travelling in water has a frequency υ_1 while travelling in petrol has a frequency υ_2 then which of the following relation is true
(A) $\upsilon_1 = \upsilon_2$ (B) $\upsilon_1 > \upsilon_2$ (C) $\upsilon_1 < \upsilon_2$ (D) Data is insufficient

4. Two thin lenses of power 2D and 8D respectiely are placed in contact. The effective focal length of the combination (in cm) is
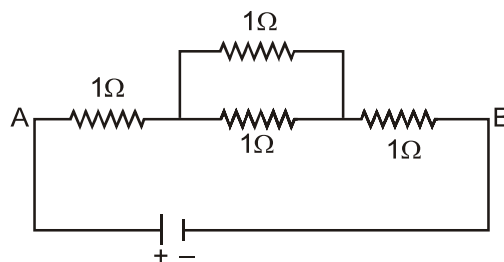(A) 10   (B) 0.1   (C) 1000   (D) 1

5. If only one of the three co-ordinates specifying the position of object changes w.r.t time, then motion will be
(A) Along a circular path   (B) Along a straight line
(C) Along a curved path   (D) 3D motion

6. If the momentum of the body is increased by 100% the kinetic energy will incrases by
(A) 100%   (B) 200%   (C) 300%   (D) 400%

7. Which of the following is not the unit of power
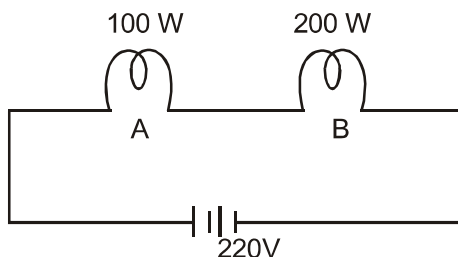(A) Horse power   (B) N-m/s   (C) Watt   (D) Kg-m/s^2

8. A car moving with 20 m/s in brought to rest in 10 seconds. The retardation provided to the car is
(A) 4 m/s^2 (B) 2 m/s^2 (C) 1 m/s^2 (D) 3 m/s^2

9. What is the effective resistance between A and B?

(A) 2.Ω (B) 4 Ω (C) 2.5 Ω (D) 3 Ω

10. Which will glow bright?

(A) Bulb A   (B) Bulb B

(C) Both will glow equally bright   (D) Data is insufficient

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.
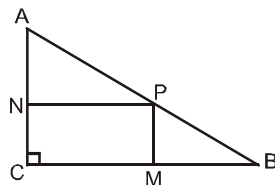
11. When common salt is added is ice

(A) its melting point decreases   (B) its melting point increases

(C) its melting point does not change from 0ºC   (D) ice becomes harder

12. Separation of cream from milk is done by

(A) filtration   (B) centrifugation method

(C) evaporation   (D) boiling

13. The law of constant composition is applied to

(A) Any element   (B) Any chemical compound

(C) Pure chemical compound   (D) None of these

14. The no. of oxygen atoms in 4.4 g of CO_2 is approx

(A) 6×10^{22} (B) 6×10^{23} (C) 12×10^{23} (D) 1.2×10^{23}

15. Which of the following represents the electronic configuration of d-block elements?

(A) $(n-1)s^2 nd^{1-10}$ (B) $(n-1)d^{1-10}ns^{1-2}$

(C) $(n-1)d^{1-10} ns^2p^6$ (D) $(n-1)p^4ns^2$

16. Elements A, B, C, D and E having the following electronic configuration

(i) $1s^2, 2s^2, 2p^1$

(ii) $1s^2, 2s^2, 2p^6, 3s^2, 3p^1$

(iii) $1s^2, 2s^2, 2p^6, 3s^2, 3p^3$

(iv) $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$

(v) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$

Electronic configurations belonging to same group are

(A) (i) and (iii)   (B) (i) and (iv)

(C) (i) and (ii)   (D) (i) and (v)

17. Carnallite is

(A) $KCl. MgCl_2$ (B) $KCl. MgCl_2. 3H_2O$

(C) $KCl. MgCl_2.6H_2O$ (D) $KCl. MgCl_2. H_2O$

18. Chemically rust is

(A) hydrated ferrous oxide

(B) hydrated ferric oxide

(C) only ferric oxide

(D) None of these

19. According to Lewis concept, a base is a substance which

(A) donates an electron pair

(B) accepts an electron pair

(C) produces hydronium ions

(D) combines with OH⁻ ions

20. A solution has pH = 9. On dilution the pH value

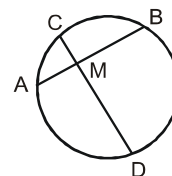(A) decreases

(B) increases

(C) remain same

(D) none of these

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 sum of the third and seventh terms of an A.P. is 6 and their product is 8, then common difference is :

(A) ± 1

(B) ± 2

(C) $\pm \dfrac{1}{2}$

(D) $\pm \dfrac{1}{4}$

22. If $\dfrac{b+c-a}{a}$, $\dfrac{c+a-b}{b}$ and $\dfrac{a+b-c}{c}$ are in A.P. and $a + b + c \neq 0$, then :

(A) $b = \dfrac{ac}{a+c}$

(B) $b = \dfrac{2ac}{a+c}$

(C) $b = \dfrac{a+c}{2}$

(D) $b = \sqrt{ac}$

23. If sum of n terms of a sequence is given by $S_n = 2n^2 + 3n$, find its 50th term.

(A) 250

(B) 225

(C) 201

(D) 205

24. The sides of a triangle are in the ratio 4 : 6 : 11. Which of the following words best described the triangle?

(A) obtuse

(B) isosceles

(C) acute

(D) impossible

25. In the diagram $\triangle ABC$ is right angled at C. Also M, N and P are the mid points of sides BC, AC and AB, respectively. If the area of $\triangle APN$ is 2 sq. cm, then the area of $\triangle ABC$, in sq. cm is :
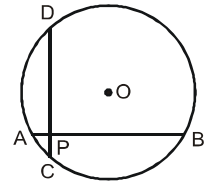

(A) 8

(B) 12

(C) 16

(D) 4

26. In the circle shown AB = 24, and the perpendicular chord CD bisects AB. If DM is 4 times as long as CM then the length of BD, is

(A) $8\sqrt{5}$

(B) $12\sqrt{5}$

(C) $16\sqrt{5}$

(D) $20\sqrt{5}$

27. Let P be a point on the circumference of a circle. Perpendiculars PA and PB are drawn to points A and B on two mutually perpendicular diameters. If AB = 36 cm, the diameter of the circle is :

(A) 16 cm (B) 24 cm (C) 36 cm (D) 72 cm

28. In the circle with centre 'O' as shown, chord AB and CD intersect at P and are perpendicular to each other. If AP = 4, PB = 6 and PC = 2, then the area of the circle is

(A) 45π

(B) 49π

(C) 50π

(D) $41\pi4$

29. Which is a true statement.

(A) If n is odd positive integer then 8 divides $n^2 - 1$

(B) If n and m are odd positive integer, then $n^2 + m^2$ is not a prefect square

(C) For every positive integer n, $\dfrac{n^5}{5} + \dfrac{n^3}{3} + \dfrac{7n}{15}$ is an integer

(D) all of these

30. The product of the solutions to the quadratic equation $ax^2 + bx + c = 0$ is 6. The product of the solutions of $bx^2 + cx + a = 0$ is 8. The product of the solutions of $cx^2 + ax + b = 0$, is :

(A) $\dfrac{4}{3}$ (B) $\dfrac{1}{48}$ (C) $\dfrac{3}{4}$ (D) 48

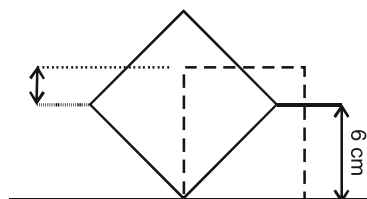**31.** If $\tan\theta + 4\cot\theta = 4$, the value of $\tan^3\theta + \cot^3\theta$ is :

(A) $8\dfrac{1}{8}$ (B) 16 (C) $7\dfrac{9}{8}$ (D) $27\dfrac{1}{27}$

32. The angle of elevation of the top of a building from the foot of tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. It the tower is 30 m high, then the height of the building is

(A) 30 m (B) 20 m (C) 15 m (D) 10 m

33. Divide 600 biscuits among 5 boys so that their shares are in Arithmetic progression and the two smallest shares together make one-seventh of what the other three boys get. What is the sum of the shares of the two boys who are getting lesser number of biscuits, than the remaining three ?
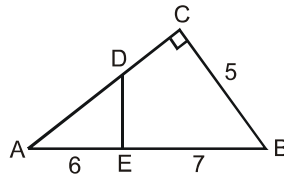
(A) 75 (B) 85 (C) 185 (D) 90

34. A square board side 10 centimeters, standing vertically, is tilted to the left so that the bottom-right corner is raised 6 centimeters from the ground. By what distance is the top-left corner lowered from its original position?
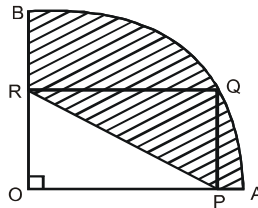

(A) 1 cm (B) 2 cm (C) 3 cm (D) 0.5 cm

35. In the figure C is a right angle, DE ⊥ AB, AE = 6, EB = 7 and BC = 5. The area of the quadrilateral EBCD is
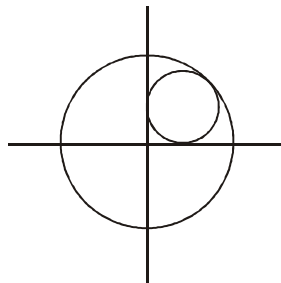

(A) 27.5　　　　　(B) 25　　　　　(C) 22.5　　　(D) 20

36. In this figure, AOB is a quarter circle of radius 10 and PQRO is a rectangle of perimeter 26. The perimeter of the shaded region is :

(A) 13 + 5π　　　　(B) 17 + 5π　　　　(C) 7 + 10π　　　　(D) 7 + 5π

37. In the figure shown, the bigger circle has radius 1 unit. Therefore, the radius of smaller circle must be

(A) $\sqrt{2}$ + 1　　　(B) $\dfrac{1}{2}$　　　(C) $\dfrac{1}{\sqrt{2}}$　　　(D) $\dfrac{1}{\sqrt{2}+1}$

38. The expression $\dfrac{bx(a^2x^2 + 2a^2y^2 + b^2y^2) + ay(a^2x^2 + 2b^2x^2 + b^2y^2)}{(ax + by)^2}$ is equal to

(A) a(x + y)　　　(B) bx + ay　　　(C) ax + by　　　(D) b(x + y)

39. A cubic polynomial p(x) is such that p(1) = 1, p(2) = 2, p(3) = 3 and p(4) = 5, then the value of p(6) is :
(A) 16　　　　　(B) 13　　　　　(C) 10　　　　　(D) 7

40. The sum of real values of y satisfying the equations $x^2 + x^2y^2 + x^2y^4 = 525$ and $x + xy + xy^2 = 35$ is :
(A) 15　　　　　(B) 10　　　　　(C) 5/2　　　　　(D) 3/2
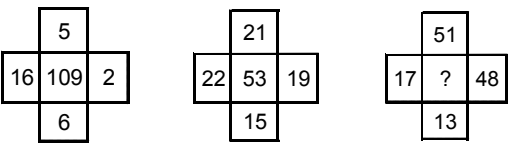
PART IV : MENTAL ABILITY
Single Correct Choice Type

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.

Direction : Find the next term :

41. 132, 138, 150, 156, 168, ?

(A) 180   (B) 183   (C) 188   (D) 191

Direction : Find the missing term :

42.

	5				21				51	
16	109	2		22	53	19		17	?	48
	6				15				13	

(A) 25   (B) 129   (C) 7   (D) 49

43. From a number of apples, a man sells half the number of existing apples plus 1 to the first customer, sells $\frac{1}{3}$ rd of the remaining apples plus 1 to the second customer and $\frac{1}{5}$ th of the remaining apples plus 1 to the third customer. He then finds that he has 3 apples left. How many apples did he have originally?
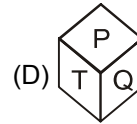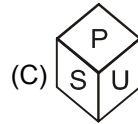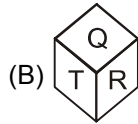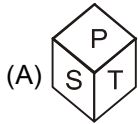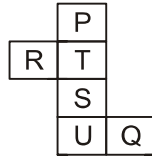
(A) 15   (B) 18   (C) 20   (D) 25

Directions (Q. 44) : Refer to the following addition. Each letter represent distinct single digit number and no two letter represents the same digit.

If E is the largest single digit prime number and B = 2H then

```
    A  B  C  D  E
 +  F  H  G  H  G
 ─────────────────
 F  I  I  I  H  F
```

44. Find the value of A + H + F

(A) 11   (B) 12   (C) 9   (D) 13

45. A boy introduced a girl, "Her father-in-law is the father of my father-in-law. What is the relation of girl to boy?

(A) Mother   (B) Mother-in-law

(C) Aunt   (D) Sister

46. On what dates of October, 1985 did Thursday fall ?

(A) 3rd, 10th, 17th, 24th, 31th

(B) 7th, 14th, 21st, 28th

(C) 6th, 13th, 20th, 27th

(D) 2nd, 9th, 16th, 23rd, 30th

47. At what time between 5 and 6 O' clock the hands of a clock will make an angle of 18° ?

(A) 20 minute past 5

(B) 24 minute past 5

(C) 25 minute past 5

(D) 22 minute past 5

48. Which of the following dices is identical to the unfolded figure as shown here?

(A) (B) (C) (D)

49. In a row at a bus stop, **A** is **7th** from the left and **B** is 9th from the right. They both interchange their positions. Now A becomes **11th** from the left. How many people are there in the row?

(A) 18   (B) 19   (C) 20   (D) 21

Directions : (Q. 50) A sheet has been folded in the manner as shown in X, Y and Z respectively and punched. You have to choose from the alternatives how it will look when unfolded.

50.

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