BE SURE WITH vidyalankar

TEST ID: EM/Sample Paper/L1

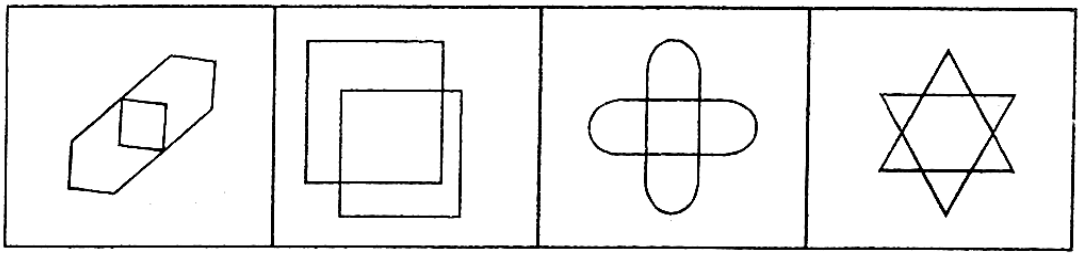
VIDYALANKAR SCHOLARSHIP CUM ADMISSION TEST (Level 1)

(For Engineering / Medical Aspirant)

Note : *i) Do not make any marks in this booklet.*
ii) Mark your answers on the separate Answer Sheet.

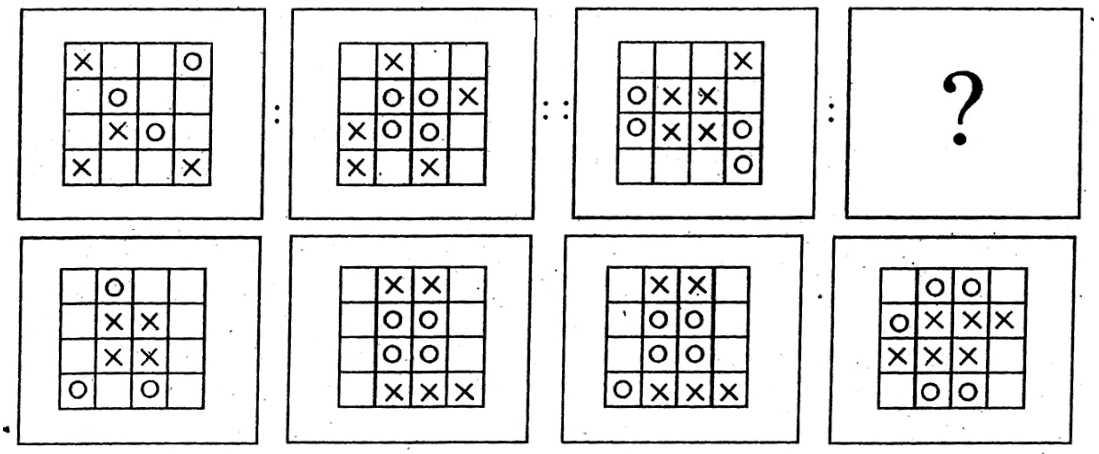
Section I : Aptitude Test

1. Find the odd term out.



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

2. In the following question there is a specific relationship between the first and second term. The same relationship exists between the third and fourth term which will replace the question mark (?). Select the correct term from the alternatives given.



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

3. ambccmamcbcamcabacamcmamcb. In the given alphabet series how many times 'm' is immediately preceded by 'a' and immediately succeeded by 'c'

(A) 6 (B) 3 (C) 5 (D) 4

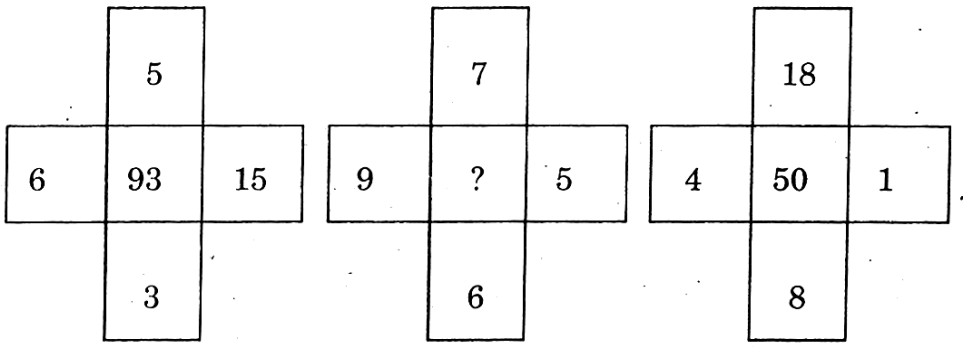
4. In a certain code language if D = 4 and DEAR = 7, then how will then word HOTEL be written?

(A) 8 (B) 10 (C) 12 (D) 20

5. A, B, C, D, E and F are six families living in different houses in a row. F and D are neighbors of B. E is neighbor of A and C. A is not a neighbor of F or D. Also C is not a neighbor of D. Who is the neighbor of F?

(A) B and C (B) B and F (C) B and D (D) Only B

6. Find the correct alternative which will replace the question mark.

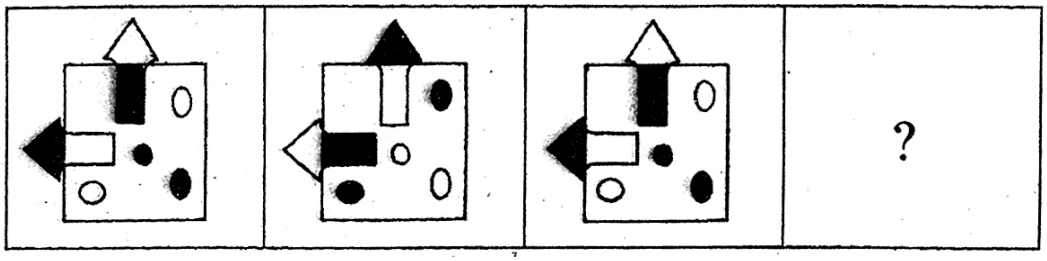


(A) 5 (B) 19 (C) 27 (D) 89

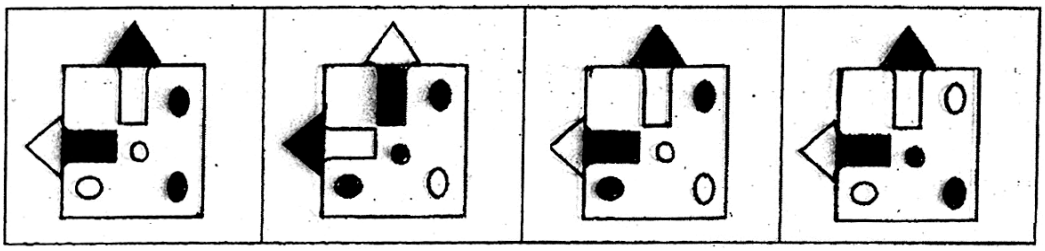
7. Birthday of three siblings falls on 1st August. Ages of Kshama and Rama on 1st August 2002 were seven years and three years respectively. If Uma is neither elder to Kshama, nor younger to Rama, then among the following, which is the birth year of Uma?
(A) 1995 (B) 1994 (C) 1997 (D) 1999

8. Find the odd term out.
(A) R22D (B) P36T (C) M29G (D) V24B

9. In the following question figures changes in a particular order. Find out the correct figure from the alternatives which will replace the question mark (?).
Question Figures:



Answer Figures:



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

10. Vivek is standing at the centre of a row of boys. Subhash is sixth to the right of Vivek. Niwas is standing fifteenth to the left of Subhash. Niwas is standing eleventh to the right of Yogesh and Yogesh is standing at one end of the row. Find the total number of boys standing in a row.
(A) 38 (B) 41 (C) 40 (D) 42

Q. 11 and 12 → **Directions :** Two tables are given below, in which two groups of alphabets are written. In table I the rows and column are numbered 0–4 and in table II the rows and columns are numbered 5–9. The alphabets in the tables are represented first by their row number and then by their column number e.g. A is represented as A = 12, 44.

Table I

	0	1	2	3	4
0	D	O	B	A	I
1	O	B	A	I	D
2	B	A	I	D	O
3	A	I	D	O	B
4	I	D	O	B	A

Table II

	5	6	7	8	9
5	W	N	R	M	L
6	N	R	M	L	W
7	R	M	L	W	N
8	M	L	W	N	R
9	L	W	N	R	M

11. Which group of numbers represents DRAW?
(A) 41, 66, 23, 55 (B) 14, 89, 12, 78 (C) 23, 57, 30, 68 (D) 32, 75, 44, 76

12. Which group of numbers represents LOAN?
(A) 95, 33, 12, 58 (B) 77, 10, 42, 97 (C) 68, 42, 03, 56 (D) 59, 24, 12, 67

13. In the following question there is a specific relationship between the first and second terms. The same relationship exists between the third and the fourth term. Understanding the relation find the term which will replace the question mark (?).
82 : 40 : : 36 : ?
(A) 19 (B) 15 (C) 74 (D) 17

14. Prakash is standing facing East. After turning 180° in anticlockwise direction, he travels straight for 8 km. Turning to right he travels 2 km, then again turn right and travels 11 km, again turns right and covers 6 km. how far is he from his starting point?
(A) 10 km (B) 3 km (C) 5 km (D) 13 km

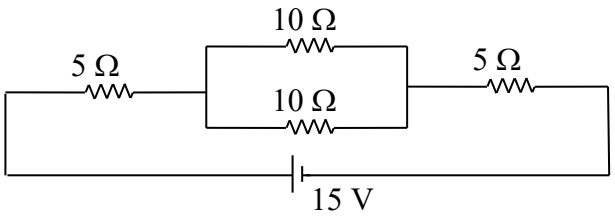
Section II : Subject Test

PHYSICS

15. The image of an object formed by a convex lens is of the same size as the object. If the image is formed at a distance of 40 cm from the lens; what is the power of the lens?
(A) 5D (B) 10D (C) 2.5D (D) 20D

16. A ray of light travelling in air is incident on the surface of a plastic slab at some angle. If the angle of refraction is 30° and the refractive of plastic is $\sqrt{3}$, what is the angle of incidence?
(A) 30° (B) 45° (C) 60° (D) 90°

17. What will be the energy dissipated as heat in 10 s in the following circuit?



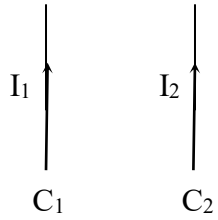
(A) 100 J (B) 150 J (C) 200 J (D) 300 J

18. Three equal resistors connected in series across a voltage source together dissipate 10 W power. If the same resistors are connected in parallel across the same source then the power dissipated will be

(1) 30 W (B) 10 W (C) 90 W (D) $\frac{10}{3}$ W

19. Two long current carrying straight conductors C_1 and C_2 are placed near each other as shown in figure. Force on C_2 due to the magnetic field produced by C_1 will be

(A) towards right
(B) towards left
(C) pointing out of the plane of the paper
(D) pointing into the plane of the paper



20 Two wires of same dimension but resistivities ρ_1 and ρ_2 are connected in series. The equivalent resistivity of the combination is:

(A) $\rho_1 + \rho_2$ (B) $\frac{1}{2}(\rho_1 + \rho_2)$ (C) $\sqrt{\rho_1\rho_2}$ (D) $2(\rho_1 + \rho_2)$

CHEMISTRY

21. Which of the following is an INCORRECT statement?

(A) Roasting is a process of heating the concentrated ore to a high temperature in absence of air.

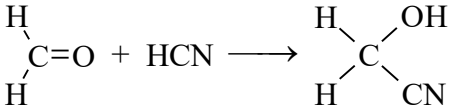
(B) Calcination is a process in which carbonate ores are strongly heated in a limited supply of air to transform them into oxides.

(C) Sulphide ores like zinc blende and galena are lighter than the impurities present. Hence, they are concentrated by froth floatation process.

(D) The process of separating gangue from the ores is called concentration of ores.

22. Identify an INCORRECT reaction from following.

(A) Substitution reaction : $CHCl_3 + Cl_2 \xrightarrow{\text{Sunlight}} CCl_4 + HCl$

(B) Addition reaction : 

(C) Oxidation reaction : $CH_3CH_2OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O + \text{Heat} + \text{Light}$

(D) Dehydration reaction : $CH_3CH_2OH \xrightarrow[\text{conc. } H_2SO_4]{170^\circ C} CH_2{=}CH_2 + H_2O$

23. What is CORRECT about the chemical reaction between potassium chloride and silver nitrate?

(A) Silver nitrate and potassium chloride undergo a decomposition reaction to form silver chloride and potassium nitrate.

(B) Silver nitrate and potassium chloride undergo a neutralization reaction to form silver chloride and potassium nitrate.

(C) Silver nitrate and potassium chloride undergo a combination reaction to form silver chloride and potassium nitrate.

(D) Silver nitrate and potassium chloride undergo a double displacement reaction to form silver chloride and potassium nitrate.

24. Refer below table carefully.

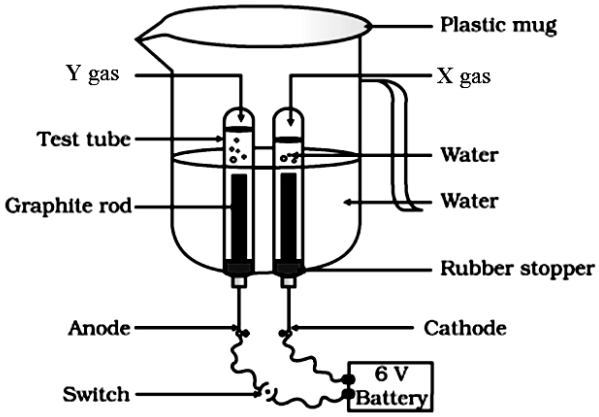
Group No.	1–IA	2–IIA	13–IIIA	14–IVA	15–VA	16–VIA	17–VIIA	18–O
2^{nd} period	Li		D			O	J	Ne
3^{rd} period	A	Mg	E	Si		H	M	
4^{th} period	R	T	I		Q	U		Y

In the above table, H does not represent hydrogen. Some elements are given in their own symbol and position in the periodic table while others are shown with a letter. Answer the following questions.

(i) Identify the most electronegative element.
(ii) Identify the most reactive element of group 1.
(iii) Identify the element from period 3 with least atomic size.
(iv) How many valence electrons are present in Q.
(v) Which element from group 2 would have the least ionization energy?

(A) (i)–J, (ii)–A, (iii)–M, (iv)–7, (v)–T
(B) (i)–M, (ii)–Li, (iii)–A, (iv)–5, (v)–Mg
(C) (i)–O, (ii)–R, (iii)–H, (iv)–3, (v)–Mg
(D) (i)–J, (ii)–R, (iii)–M, (iv)–5, (v)–T

25. Identify the gases liberated at cathode (X) and anode (Y) respectively during electrolysis of water.



(A) H_2 is liberated at cathode and O_2 is liberated at anode in 2 : 1 ratio.
(B) O_2 is liberated at cathode and H_2 is liberated at anode in 1 : 1 ratio.
(C) H_2 is liberated at cathode and O_2 is liberated at anode in 1 : 2 ratio.
(D) O_2 is liberated at cathode and H_2 is liberated at anode in 2 : 1 ratio.

26. Match the following columns.

Column I		**Column II**	
(a)	Natural gas	(i)	Polymerization of ethene
(b)	Coke	(ii)	Benzene
(c)	C_nH_{2n}	(iii)	Methane
(d)	Kerosene	(iv)	Destructive distillation of coal
(e)	C_6H_6	(v)	Refining of petroleum
(f)	Polythene	(vi)	General formula of Alkene

(A) (a)–(i), (b)–(ii), (c)–(vi), (d)–(iii), (e)–(iv), (f)–(v)
(B) (a)–(ii), (b)–(i), (c)–(iii), (d)–(v), (e)–(iv), (f)–(vi)
(C) (a)–(vi), (b)–(i), (c)–(ii), (d)–(iv), (e)–(iii), (f)–(v)
(D) (a)–(iii), (b)–(iv), (c)–(vi), (d)–(v), (e)–(ii), (f)–(i)

MATHEMATICS

27. The number of real roots of the equation $(x^2 + 1)^2 - x^2 = 0$ is
(A) 4 (B) 2 (C) 0 (D) 3

28. A man standing on a top of 100 m high tower sees a car moving towards the tower at an angle of depression of 30°. After some time, the angle of depression becomes 60°. Find the distance travelled by car in this time interval.
(A) $100\sqrt{3}$ m (B) $200\sqrt{3}$ m (C) $\frac{200}{\sqrt{3}}$ m (D) $\frac{100}{\sqrt{3}}$ m

29. In an A.P. if a = 1, $a_n = 20$ and $S_n = 399$, then n =
(A) 19 (B) 21 (C) 38 (D) 42

30. Unit place of 7^{400} is
(A) 3 (B) 9 (C) 7 (D) 1

31. In an election the supporters of two candidates A and B were taken to polling booth in two different vehicles, capable of carrying 10 and 15 voters, respectively. If 90 vehicles were required to carry a total of 1200 voters, then find the number of votes by which the election was won by a candidate.
(A) 900 (B) 600 (C) 300 (D) 500

32. A triangle is formed by points (6, 0), (0, 0), and (0, 6). How many points with the integer coordinates are in the interior of the triangle?
(A) 7 (B) 6 (C) 8 (D) 10

Biology

33. With an expansion in community groups , the close attachment among the people also increased, and this has resulted in the extensive breakout of
(A) Non – infectious disease (B) Virus
(C) Communicable disease (D) Infectious disease

34. When a person suddenly shifts to a dark room, after travelling from a highly radiant area, then certain problem occurs in perceiving the objects for a short period of time and then there is considerable improvement in vision after a while. This refinement is known as
(A) Light adaptation (B) Dark adaptation (C) Rhodopsin (D) Light intensity

35. The lymph glands found on the side of neck helping in defence are called–
(A) Lymph (B) Thymus (C) Interstitial fluid (D) Tonsils

36. Which of the following statements about food chain and energy flow through ecosystem is false?
(A) Food webs include two or more food chains.
(B) All organisms that are not producers are consumers.
(C) A single organism can feed at several trophic levels.
(D) Detritivores feed at all trophic levels except the producer level.

37. The main cause for abundant coliform bacteria in the river Ganga is–
(A) disposal of human excreta directly
(B) discharge of effluents from electroplating industries
(C) washing of clothes
(D) immersion of ashes.

38. A boy has taken fresh twig from a tree and then he placed it into coloured water. After a few hours he cut the surface of the twig and examines it with a magnifying glass to study the path of water movement. This experiment demonstrates that movement of water occurs through–
(A) Xylem (B) Phloem (C) Sieve tube (D) Casparian strip

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