9. A person starts towards South direction. Which of the following order of directions will lead him to East direction ?

(A) right, right, right (B) left, left, left (C) left, right, right (D) left, right, left

10. If I stand on my head with my face pointing Northwards, in what direction will my right-hand point ?

(A) East (B) West (C) North (D) South

11. The time on the watch is quarter to three. If the minute-hand points to North-East, in which direction does the hour hand point ?

(A) South-West (B) South-East (C) North-West (D) North-East

12. A and B start walking from the same point. A foes North and covers 3 km; then turns right and covers 4 km. B goes west and covers 5 km, then turns right and covers 3 kms. How far apart are they from each other ?

(A) 10 km (B) 9 km (C) 8 km (D) 5 km

13. A and B start walking in opposite direction. A walked 5 km, B 6 km. Thereafter both turned to their right and walked 2 km. They turned to right again and walked 3 km, again turned to right and walked 2 km. How much distant apart are they from each other ?

(A) 2 km (B) 13 km (C) 3 km (D) 5 km

14. A watch reads 4 : 30. If the minute-hand points to East, in which directions does the hour-hand point ?

(A) North-East (B) South-East (C) North-West (D) North

15. L is to South-West of K, M is to the East of L and South-East of K and N is to the North of M in line with LK. In which direction of K is N located ?

(A) North (B) East (C) South-East (D) North-East

16. If South-East becomes North, North-East becomes West and so on, what will South become ?

(A) North-East (B) South - West (C) South (D) Northwest

17. I run along the sides of a square field ABCD where C is to the North-East of A and D is to the South-East of B. Starting From A in anti-clockwise direction, in which direction shall I be running after crossing C ?

(A) East (B) West (C) North (D) South

18. Shehnaz wants to go to the School. She starts from her home which is in North and comes to the crossing. The road to her left ends in a park and straight ahead is the office complex. In which direction is the School ?

(A) East (B) North (C) West (D) South

Directions : (19 to 23) Read the following statements and choose the correct alternative.

(i) A is a north of E and west of C.
(ii) B is north of A and west of P.
(iii) D is south and east of A.
(iv) E is north of F and east of D.
(v) F is north D and west of A.
(vi) C is south of F and west of D.

19. Which of the towns is furthest to the north west ?

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

20. Which of the following must be both north and east of F ?

I. A II. C III. E

(A) II only (B) III only (C) I and II (D) I and III

21. Which of the following towns must be situated both south and west of at least one other town ?

(A) A and E (B) A and F (C) B and F (D) C, D and E

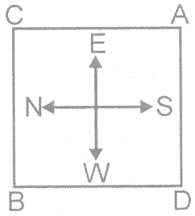
22. Which of the following statements, if true, would make the information in the numbered statements more specific ?

(A) C is north of D (B) E is north of D (C) A is east of B (D) C is east of F

23. I run along the sides of square field ABCD where C is to the north east of A and D is to the south east of B. Starting from A in anticlock wise direction, in which direction shall I be running after crossing B ?

(A) North (B) South (C) East (D) West

Directions : (24 to 26) The following questions are based on the diagram given below showing four persons stationed at the four corners of a square piece of plot as shown.



24. A starts crossing the field diagonally. After walking half the distance, he turns right, walks some distance and turns left. Which direction is A facing now ?

(A) North-east (B) North-west (C) North (D) South-east

25. From the original position given in the above figure. A and B move one arm length clockwise and then cross over to the corner diagonally opposite ; C and D move one arm length anti-clockwise and cross over the corner diagonally opposite. The original configuration ADBC has now changed to

(A) CBDA (B) BDAC (C) DACB (D) ACBD

26. From the original position, B and D move one and a half length of sides clockwise and anticlockwise respectively. Which one of the following statements is true?

(A) B and D are both at the midpoint between A and C

(B) D is at the midpoint between A and C, and B at the corner originally occupies by C.

(C) B is at the midpoint between A and C, and D at the corner originally occupied by A.

(D) B and D are both at the midpoint between A and D.

ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	A	B	A	D	A	D	A	D	A	B	A	B	D
Que.	14	15	16	17	18	19	20	21	22	23	24	25	26
Ans.	A	D	A	B	C	B	D	B	A	B	B	A	A

➤➤➤ ANALOGY ➤➤➤

Analogy means **'Similarity'.** A particular relationship is given and another similar relationship has to be identified from the alternative provided.

KINDS OR RELATIONSHIPS :

Study & topic Relationship :

Some Examples :

1. Botany : Study of Plants	**2.** Zoology : Animals	**3.** Seismology : Earthquakes
4. Astrology : Future	**5.** Pathology : Diseases	**6.** Cardiology : Heart
7. Astronomy : Planets	**8.** Tectonics : Buildings	**9.** Taxidermy : Stuffing (Animals)
10. Penology : Punishment	**11.** Cytology : Cells	**12.** Geology : Earth
13. Archaeology : Artifacts	**14.** Ecology : Environment	**15.** Anthology : Collection of Poems
16. Trigonometry : Triangles	**17.** Menstruation : Area	**18.** Ornithology : Birds
19. Onomatology : Names	**20.** Ontology : Reality	**21.** Ethnology : Human Races
22. Herpetology : Amphibians	(Anthropology : Man)	**23.** Paleography : Writings
24. Ichthyology : Fish (es)	**25.** Semantics : Language	**26.** Nephrology : Kidney
27. Concology : Shells	**28.** Hematology : Blood	**29.** Mycology : Fungi
30. Oology : Eggs	**31.** Virology : Viruses	**32.** Craniology : Skill
33. Entomology : Insects	**33.** Occultism Supernatural	**37.** Taxonomy : Classification
38. Orogaphy : Mountains	**39.** Selenography : Moon	**40.** Eccrinology : Secretions
41. Histology : Tissues	**42.** Nidology : Nests	**43.** Phycology : Algae
44. Bryology : Bryophyte		

Worker & Tool Relationship :

Ex. Laborer : Spade

Spade is a tool used by a Laborers.

Some more examples -

1. Carpenter : Saw	**2.** Wood cutter : Axe	**3.** Blacksmith : Anvil
4. Soldier : Gun	**5.** Tailor - Needle	**6.** Chef : Knife
7. Framer : Plough	**8.** Author : Pen	**9.** Warrior : Sword
10. Sculptor : Chisel	**11.** Mason : Plumb line	**12.** Doctor : Stethoscope
13. Gardner : Harrow	**14.** Surgeon : Scalpel	**15.** Cobbler : Awl
16. Lumberjack : Axe	**17.** Painter : Brush	**18.** Violinist : Bow
19. Barber : Scissors	**20.** Butcher : Chopper	
21. Astronomer : Telescope	**22.** Jockey : Tack	

Tool & Action Relationship :

Ex. Needle : Saw

1. Knife : Cut **2.** Gun : Short **3.** Pen : Write

4. Microscope : Magnify **5.** Spanner : Grip **6.** Sword : Slaughter

7. Filter : Purity **8.** Spade : Dig **9.** Mattock : Dig

10. Steering : Drive **11.** Spoon : Feed **12.** Chisel : Carve

13. Axe : Grind **14.** Shield : Guard **15.** Loudspeaker : Amplify

16. Auger : Bore **17.** Oar : Row **18.** Shovel : Scoop

Worker and Working place :

Ex. Chef : Kitchen

Chef works in a kitchen

1. Farmer : Field **2.** Warrior : Battle field **3.** Engineer : Site

4. Sailor : Ship **5.** Pilot : Cockpit **6.** Beautician : Parlor

7. Actor : Stage **8.** Mechanic : Garage **9.** Lawyer : Court

10. Scientist : Laboratory **11.** Waiter : Restaurant **12.** Gambler : Casino

13. Servant : House **14.** Worker : Factory **15.** Umpire : Pitch

16. Teacher : School **17.** Artist : Theatre **18.** Doctor : Hospital

19. Clerk : Office **20.** Driver : Cabin **21.** Painter : Gallery

22. Grocer : Shop

Worker & Product :

Ex. Poet : Poem

Poet writes poem :

Ex. Chef : Food

Chef makes food

1. Farmer : Crop **2.** Author : Book **3.** Gold Smith : Ornaments

4. Cobbler : Shoes **5.** Editor : Newspaper **6.** Hunter : Prey

7. Carpenter : Meat **8.** Butcher : Meat **9.** Judge : Justice

10. Producer : Film **11.** Architect : Design **12.** Tailor : Clothes

13. Dramatist : Play **14.** Choreographer : Ballet **15.** Teacher : Educations

16. Mason : Wall

Product and Raw Material :

Ex. Cloth : Fibre (Cloth is made of Fibre)

1. Paper : Pulp **2.** Book : Paper **3.** Jewelry : Gold

4. Oil : Seed **5.** Road : Asphalt **6.** Sack : Jute

7. Metal : Ore **8.** Fabric : Yarn **9.** Pullover : Wool

10. Furniture : Wood **11.** Butter : Milk **12.** Wine : Grapes

13. Omelette : Egg **14.** Rubber : Latex **15.** Wall : Brick

16. Shoes : Leather **17.** Prism : Glass **18.** Linen : Flax

19. Jaggery : Sugarcane

Instrument & Measurement :

Ex. Ammeter : Current

1. Scale : Length Scale in an Instrument used to measure length.

2. Balance : Mass **3.** Thermometer : Temperature **4.** Odometer : Speed

5. Hygrometer : Humidity **6.** Screw gauge : Thickness **7.** Seismograph : Earthquake

8. Anemometer : Wind vane **9.** Taseometer : Strains **10.** Rainguage : Rain

11. Barometer : Pressure **12.** Sphymonometer : Blood Pressure

Quantity & Unit :

Ex. Time : Seconds

Seconds in the unit of Time.

1. Force : Newton **2.** Length : Meter **3.** Energy : Joule

4. Work : Joule **5.** Current : Ampere **6.** Volume : Litre

7. Power : Watt **8.** Potential : Volt **9.** Mass : Kilogram

10. Pressure : Pascal **11.** Area : Hectare **12.** Temperature : Degrees

13. Resistance : Ohm **14.** Angle : Radians **15.** Magnetic field : Oersted

16. Conductivity : Mho **17.** Luminosity : Candela

Animal & Young ones :

Ex. Dog : Puppy (Puppy is the young one of Dog)

1. Lion : Cub **2.** Man : Child **3.** Hen : Chicken

4. Sheep : Lamp **5.** Cow : Calf **6.** Cat : Kitten

7. Duck : Duckling **8.** Horse : Pony/Calf **9.** Insect : Larva

10. Stallion : Colt **11.** Butterfly : Caterpillar **12.** Frog : Tadpole

Male & Female :

Ex. Tiger : Tigress

Tigress is Female tiger

1. Son : Daughter **2.** Gentleman : Lady **3.** Nephew : Niece

4. Drone : Bee **5.** Dog : Bitch **6.** Stage : Doe

7. Sorcerer : Sorceress **8.** Horse : More **9.** Lion : Lioness

Word & Synonym :

Ex. Vacant : Empty (Empty means almost the same as Vacant)

1. Substitute : Replace **2.** Blend : Mix **3.** House : Home

4. Solicit : Request **5.** Flaw : Defect **6.** Fierce : Violent

7. Dearth : Scarcity **8.** Ban : Prohibition **9.** Mend : Repair

10. Assign : Allot **11.** Abduct : Kidnap **12.** Sedate : Calm

13. Alight : Descend **14.** Pressure : Assume **15.** Presage : Predict

16. Fallacy : illusion **17.** Brim : Edge **18.** Dissipate : Squander

19. Haughty : Proud **20.** Dissipate : Squander

Word & Antonym :

Ex. Good : Bad

1. Cruel : Kind	**2.** Best : Worst	**3.** Sink : Float
4. Strong : Weak	**5.** Initial : Final	**6.** Start : End
7. Ignore : Notice	**8.** Advance : Retreat	**9.** Create : Destroy
10. Gentle : Harsh	**11.** Gradual : Abrupt (Sudden)	**12.** Condense : Expand
13. Deep : Shallow	**14.** Affirm : Deny	**15.** Kindle : Extinguish
16. Mourn : Rejoice	**17.** Cordial : Hostile	**18.** Kindle : Extinguish
19. Chaos : Peace	**20.** Fresh : Stale	**21.** Lend : Borrow

Words & Intensity :

Ex. Quarrel : War

1. Anger : Rage	**2.** Kindle : Burn	**3.** Error : Blunder
4. Wish : Desire	**5.** Sink : Drown	**6.** Famous : Renowned
7. Unhappy : Sad	**8.** Crime : Sin	**9.** Refuse : Deny
10. Moist : Drench		

SIMPLE ANALOGY :

Directions : (1 to 3) In the following questions, choose the words that show the same relationship as given in the each questions.

Ex.1 **Flower** is to a **Bouquet** as **Minister** is to a.

(A) Voter (B) Cabinet (C) Constituency (D) Department

Sol. (B) Second word **Bouquet** is group of first word 'Flower'. In the same manner **Cabinet** is a group of **Ministers.**

Ex.2 **Hour** is related to **Second** in the same way as **Tertiary** is related to

(A) Ordinary (B) Secondary (C) Primary (D) Intermediary

Sol. (C) **Second** is the third positions after **Hour** in time measurement. Likewise **Tertiary** is the third position after **Primary** in he other of ranking.

Ex.3 **Sports** is related to **Logo** in the same way as **Nation** is related to

(A) Emblem (B) Animal (C) Ruler (D) Anthem

Sol. (A) The symbol **Logo** is related to **Sports.** Likewise **Emblem** is related to **Nation.**

LETTER ANALOGY :

In letter analogy questions, the question pair and answer pair consists of letter. You have to examine the question pair and find the relationship between them and choose the answer pair that contains the same analogy or relationship as in the question pair.

Directions : (4 to 13) In each of the following questions, there are two terms to the left of the sign :: which are related in some way. Obtain the same relationship between the term to the right of the sign :: from one of the flour alternatives given under it.

Ex.4 ef : jk :: no : ?
(A) dc (B) gi (C) ml (D) tu
Sol. (D) In the questions pair 'ef : jk'. The letters of the first term 'ef' are in natural alphabetic sequence. So is the second term 'jk'. The letter **'no'** are also in the natural alphabetic sequence.

Ex.5 FG : LM :: ? : ?
(A) NO : TO (B) HI : RS (C) CH : KL (D) DE : BA
Sol. (A) Examine the questions pair 'FG : LM'. The relationship is that the lettes are in alphabetic order and five letters are skipped between terms.

Ex.6 LXNU : NYPV : QTBR : ?
(A) RUSD (B) SDSU (C) SUDS (D) RSUD
Sol. (C) Second term is obtained from the first by moving its first and third letters two steps forward while the second and fourth letters one step forward.

Ex.7 MANTEL : NAMLET :: VANITY : ?
(A) NAVYIT (B) NAVYTI (C) NAVIYI (D) AVNTIY
Sol. (B) Group of three letters is reversed.

Ex.8 TUEDAY : UUFSCAX :: SQUAREE : ?
(A) TQUASED (B) TQVASED (C) TQVAQED (D) TQVARED
Sol. (C) Sequence is + 1, 0, +1, 0, -1, 0, -1

Ex.9 AEZ : EIY :: IOX : ?
(A) UYZ (B) AEZ (C) EIX (D) OUW
Sol. (D) Each term has two vowels in the beginning, and the first letter from backward sequence. Hence AE (vowels) Z, EI (vowels) Y etc.

Ex.10 ECF : FDG :: IEH : ?
(A) OFJ (B) OFI (C) GHI (D) LMN
Sol. (B) Each item stars with a vowel which maintains the sequence of AEIOU as is seen from other items. After a vowel, 2 letters follow, of which 2 intervening consecutive letters are skipped. i.e. C(DE) F, D(F) G, E(FG) H and F (GH) I.

Ex.11 CG : EI :: FJ : ?

(A) JK (B) IJ (C) LM (D) GK

Sol. (D) Letter groups consist of 2 letters in alphabetic order skipping 3 letters immediately following :

Ex.12 DFHJ : LNPR :: ? : BDFH

(A) VXZT (B) UVXZ (C) TXVZ (D) TVXZ

Sol. (D) All the letters of the second term are moved eight steps backward to obtain the first term.

Ex.13 DULC : EVMD :: ? : GXOF

(A) FWNE (B) HNWE (C) HWNE (D) FUEN

Sol. (A) First term is obtained from the second by moving all its letters one step backward.

WORD ANALOGY :

Ex.14 India Gate : Delhi : _____ : _____

(A) Chicago : USA (B) Albany : New York

(C) Agra : Taj Mahal (D) Chandigarh : Rock Garden

Sol. (B) India Gate is in Delhi, Albany is in New York.

Ex.15 PUNJAB : AMRITSAR :: _____ : _____

(A) Golden Temple : Amritser (B) Moscow : Russia

(C) India : Asia (D) Agra : Taj Mahal

Sol. (D) Amritser is in Pujab, Taj Mahal is in Agra

Direction : (16) In each of the following questions, two words indicated by I and Ii have been left out. The correct word to come in place of I is given as one of the four alternatives against I and the correct word to come in place of Ii is given as one of the four alternatives against II. Read with the correct words, there is some relationship between the two words to the left of the sign (: :) and the same relationship obtains between the two words to the right of the sign (: :) The correct combination is given as one of the four alternatives (a), (b), (c) and (d). Find the correct combination in each case.

Ex.16 I : Melt : : Bright : II

I. (a) Liquid (b) Ice (c) Heat (d) Freeze

II. (P) Dull (Q) Dazzle (R) Light (S) Colour

(A) aS (B) bR (C) cQ (D) dP

Sol. (d) The words in each pair are antonyms of each other.

Directions : (17 to 18) In each of the following questions, a group of three interrelated words is given. Choose a word from the given alternates, that belongs to the same group.

Ex.17 Marble : Slate : Gneiss

(A) Quartzite (B) Limestone (C) Coal (D) Sandstone

Sol. (A) All are metamorphic rocks.

Ex.18 Pituitary : Thyroid : pancreas

(A) Adrenal (B) Heart (C) Liver (D) Kidney

Sol. (A) All are endocrine glands.

Directions : (19 to 20) Three words in bold letters are given in each question, which have something in common among themselves. Out of the four given alternatives, choose the most appropriate de-scription about these three words.

Ex.19 Analects : Zend Avesta : Torah

(A) These are places of worship (B) These are three sects of Muslims

(C) These are names of religions (D) These are names of religious books.

Ans. (D)

Ex.20 Hiss : Hoot : Trumpet

(A) They are sounds made by certain creatures

(B) They are joyous cries of children

(C) They are sound made by war-instruments.

(D) The terms are used in connection with under-world activities.

Ans. (A)

NUMBER ANALOGY :

Directions : (21 to 23) In each of the following questions, there is a certain relation between two given number on one side of :: and one number is given on another side of :: while another number is to be found from the given alternatives, having the same relation with this number as the numbers of the given pair bear. Choose the best alternative.

Ex.21 7584 : 4251 :: 4673 : ?

(A) 1367 (B) 1340 (C) 1531 (D) None of these

Ex.22 225 : 257 :: 289 : ?

(A) 301 (B) 316 (C) 320 (D) 325

Ex.23 5 : 18

(A) 30 : 96 (B) 21 : 66 (C) 19 : 61 (D) 11 : 35

Sol. (B) The relationship is x : (3x + 3)

Directions : (24 to 26) In each of the following questions, choose one number which is similar to the numbers in the given set.

Ex.24 Given set : 192, 282, 372

(A) 453 (B) 461 (C) 236 (D) 425

Sol. (A) In all the numbers, the sum of digits is 12 and the largest digit lies in the middle.

Ex.25 Given set : (8, 15, 24)

(A) (6, 13, 21) (B) (10, 17, 28) (C) (11, 18, 27) (D) (13, 20, 32)

Sol. (C) In each set, 2nd number = 1st number + 7 ; 3rd number = 2nd number + 9.

Ex.26 Given set : (8, 3, 2)

(A) (10, 6, 5) (B) (63, 8, 3) (C) (95, 24, 5) (D) (168, 15, 4)

Sol. (B) each set, 1st number = (2nd number)^2 - 1 ; 2nd number = (3rd number)^2 - 1.

PRACTICE EXERCISE

Directions : (1 to 4) in the Following questions, choose the words that show the same relationship as given in the each questions.

1. **Bank** is related to **Money** in the same way as **Transport** is related

(A) Goods (B) Road (C) Terrace (D) Floor

2. What is related to **Taka** in the same way as **Lira** is related to **Italy ?**

(A) Pakistan (B) Jordan (C) Mexico (D) Bangladesh

3. **Needle** is related to **Clock** as **Wheel** is related to _____

(A) Drive (B) Vehicle (C) Circular (D) Move

4. **Boat** is related to **Oar** in the same way as **Bicycle** is related to

(A) Road (B) Wheel (C) Seat (D) Paddle

Directions : (5 to 11) In each of the following questions, there are two terms to the left of the sign :: which are related in some way. Obtain the same relationship between the term to the right of the sign :: from one of the four alternatives given under it.

5. ? : CEIG :: LNRP : OKUM

(A) FELD (B) ZHFJ (C) FHFJ (D) ABLD

6. KLQM : CFMK :: NRPT : ?

(A) FLLR (B) HIJH (C) FLTM (D) RLTM

7. LJPN : KMOQ :: ? : XVTZ

(A) YSUV (B) SUWY (C) VTWY (D) YSUW

8. APOC : ? :: ITSK : MVUN

(A) DRQH (B) ERQF (C) EQRG (D) DQRH

9. AZB : BYC :: CXD : ?

(A) DWE (B) DEF (C) DFG (D) DMN

10. ABCD : WXYZ :: EFGH : ?

(A) STUV (B) TSUV (C) STUE (D) STVU

11. ACEG : ? :: BDFH : KMOQ

(A) LMNO (B) JLNP (C) JNLO (D) JLON

Directions : (12 to 13) In each of the following questions, two word indicated by I and Ii have been left out. The correct word to come in place of I is given as one of the four alternatives against I and the correct word to come in place of Ii is given as one of the four alternatives against II. Read with the correct words, where is some relationship between the two words to the left of the sign (::) and the same relationship obtains between the two words to the right of the sign (::). The correct combination is given as one of the four alternatives (a), (b), (c) and (d). Find the correct combination in each case.

12. I : Water :: Thermometer : II

I.	(a) Humidity	(b) Rain	(c) Pitcher	(d) Evaporation
II.	(P) Temperature	(Q) Mercury	(R) Doctor	(S) Fever

(A) aS (B) cQ (C) dP (D) bR

13. I : Flower :: Milky way : II

I.	(a) Garden	(b) Plant	(c) Fruit	(d) petals
II.	(P) Galaxy	(Q) Star	(R) Sky	(S) Planet

(A) bP (B) dR (C) aQ (D) cS

Directions : (14) Question consists of a pair of numbers that have a certain relationship to each other, followed by four other pairs of numbers given as alternatives. Select the pair in which the numbers are similarly related as in the given pair.

14. 11 : 1210

(A) 6 : 216 (B) 7 : 1029 (C) 8 : 448 (D) 9 : 729

Direction : (15) Questions consists of a particular pattern. Find the pattern and answer the questions.

15. Given set : 992, 733, 845, 632

(A) 114 (B) 326 (C) 425 (D) 236

Direction : (16) In each of the following questions, choose that set of numbers form the alternative sets. That is similar to the given set ?

16. Given : (246, 257, 358)

(A) (144, 235, 325) (B) (143, 253, 246) (C) (273, 365, 367) (D) (233, 343, 345)

Directions : (17 to 18) In each of the following questions, a group of three interrelated words in given. Choose a word from the given alternatives that belongs to the same group.

17. Potato : Carrot : Reddish

(A) Tomato (B) Spinach (C) Sesame (D) Groundnut

18. Basket : Pail : Pan

(A) Spoon (B) Bowl (C) Fork (D) Knife

Directions: (19 to 20) three words in bold letters are given in each question, which have something in common among themselves. Out of the four given alternatives, choose the most appropriate description about these three words.

19. Spinach : Fenugreek : Celery

(A) These are cactus plant (B) These are wild flowers

(C) These are wild plants (D) These are leafy vegetables

20. Petrol : Phosphorus : Cooking gas

(A) They are fuels (B) They are highly inflammable

(C) They can't be sold without permit (D) India has to import them

Directions : (21 to 27) In the following question, choose the pair/group of words that show the same relationship as given at the top of every pair/group.

21. Manager : Cabin

(B) Driver : Train (B) Captain : Desk (C) Pilot : Cockpit (D) Servant : Hospital

22. Aeroplane : Hanger

(A) Train : yard (B) Train : Plant form (C) Train : Rail (D) Train : Railway station

23. Engineer : Machine

(A) Doctor : Disease (B) Doctor : Medicine (C) Doctor : Hospital (D) Doctor : Body

24. Mosquito : Malaria : :

(A) Tobacco : Cancer (B) Road : Accident (C) Housefly : Food (D) Soil : Erosion

25. Light : Ray :: Sound : ?

(A) Hear (B) Wave (C) Audio (D) Pitch

26. Paisa - Rupee, centimeter - Metre, Kilogram - ?

(A) Metric tonne (B) Hectogram (C) Quintal (D) Gram

27. Water : Oxygen

(A) Helium : Nitrogen (B) Salt : Sodium (C) Tree : Plant (D) Food : Hunger

Direction : (28 to 29) Find out the correct words from the options to fill in the blanks. The world which is in some way related to the word on the right as well as to the word on its left is the correct answer.

28. Medicine __spacecraft

(A) Effective (B) Advanced (C) Capsule (D) Homeopathy

29. Money __ River

(A) Flow (B) Liquid (D) Dam (D) Bank

ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	A	D	B	D	B	A	D	B	A	A	B	B	C	C	C
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Ans.	C	D	B	D	B	C	A	D	A	B	C	B	B	D	

CLASSIFICATION

CLASSIFICATION :

'Classification' means 'to assort the items of a given group on the basis of certain common quality they posses and then spot the stranger out'/

Directions (1 to 5) In each of the following questions, five words are given, out of which four are same in one way and the fifth one is different from others. Select the odd one.

Ex.1 (A) Sun (B) Moon (C) Venus (D) Mars
(E) Earth
Sol. (B) All the terms except **Moon** are related to the Solar system.

Ex.2 (A) Green (B) Violet (C) Brown (D) Yellow
(E) Orange
Sol. (C) Except **Brown** all the colours are present in rainbow.

Ex.3 (A) Silk (B) Fur (C) Milk (D) leather
(E) Rubber
Sol. (E) Only **Rubber** is the three product.

Ex.4 (A) Milk (B) Syrup (C) Squash (D) Tea
(E) Cake
Sol (E) All other are the drinks.

Ex.5 (A Conscience (B) Morality (C) Conduct (D) Will-power
(E) Weight
Sol. (E) All other terms are used to represent human behavioral personality factors.

Directions : (6 to 9) In each of the following questions four out of five alternatives contain alphabet placed in a particular from. Find the one that does not belong to the group.

Ex.6 (A) NKMJ (B) FCEB (C) URTQ (D) KHJG
(E) TQRP
Sol. (E) In all other groups there is a gap of one letters in the alphabet between second and third letter.

Ex.7 (A) DW (B) GT (C) KP (D) FR
(E) HS

Sol. (D) In all other pairs of words first and second letters are equidistant from the beginning and end respectively in the alphabetical series.

Ex.8 (A) A8C (B) D22G (C) H42M (D) B36P
(E) F34J

Sol. (E) In all other groups number between first and second letter is twice the sum of positions of first and last letters in the alphabet.

Ex.9 (A) KQ14 (B) AY13 (C) MT11 (D) GW15
(E) LZ19

Sol. (C) In all other groups number at the end is half of the positions of sum of first and second letters in the alphabet.

Directions : (10 to 14) In the following question, numbers given in four out of the five alternatives have some relationship. You have to choose the one which does not belong to the group.

Ex.10 (A) 3 : 8 (B) 6 : 35 (C) 7 : 50 (D) 1 : 0
(E) 9 : 80

Sol. (C) In other numbers second number is one less than the square of first number.

Ex.11 (A) 21 : 24 (B) 28 : 32 (C) 14 : 16 (D) 70 : 80
(E) 54 : 62

Sol. (E) The ratio among the number is 7 : 8

Ex.12 (A) 4 (B) 8 (C) 16 (D) 9
(E) 25

Sol. (B) All other numbers are square of natural numbers.

Ex.13 (A) 22 : 0 (B) 24 : 12 (C) 23 : 5 (D) 18 : 63
(E) 24 : 18

Sol. (E) Second number is the difference of the square of digits of first number.

Ex.14 (A) 43 (B) 53 (C) 63 (D) 73
(E) 83

Sol. (C) All other numbers are prime numbers.

PRACTICE EXERCISE

Directions : (1 to 23) In the following questions, three out of the four alternatives are same in a certain way and so form a group. Find the odd one that does not belong to the group.

1. (A) Gold (B) Silver (C) Bronze (D) Iron

2. (A) Yen (B) Lira (C) Dollar (D) Ounce

3. (A) Huge (B) Tiny (C) Heavy (D) Small

4. (A) Teeth (B) Tongue (C) Palate (D) Chin

5. (A) Silk (B) Cotton (C) Nylon (D) Wool

6. (A) Triangle (B) Tangent (C) Square (D) Rhombus

7. (A) Lion-Deer (B) Cat-Mouse (C) Hawk-Pigeon (D) Pig-Piglet

8. (A) Work-Leisure (B) Day-Night
(C) Expedite-procrastinate (D) Frequently-Always

9. (A) April (B) May (C) July (D) September

10. (A) DBF (B) HFK (C) NLP (D) XVZ

11. (A) MrW (B) ChN (C) KpU (D) BgL

12. (A) DFHB (B) KMOJ (C) PRTN (D) XZBV

13. (A) ROQP (B) KHJI (C) VSUT (D) JHIG

14. (A) ACE (B) MOQ (C) RTV (D) UWY

15. (A) BDI (B) KMR (C) PRW (D) FHN

16. (A) 232 (B) 362 (C) 661 (D) 284

17. (A) 488 (B) 929 (C) 776 (D) 667

18. (A) 9 : 80 (B) 1 : 0 (C) 12 : 13 (D) 10 : 91

19. (A) 4, 6, 10, 7 (B) 4, 12, 20, 28 (C) 1, 3, 5, 7 (D) 2, 6, 10, 14

20. (A) 22 : 44 (B) 39 : 981 (C) 45 : 1625 (D) 24 : 464

21. (A) 385 (B) 572 (C) 671 (D) 427

22. (A) 27 (B) 125 (C) 1321 (D) 729

23. (A) 9 - 27 (B) 15 - 45 (C) 10 - 30 (D) 20 - 60

ANSWEERS

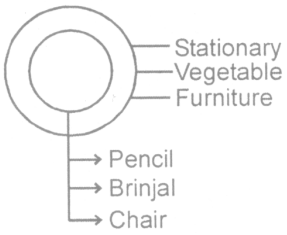
Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	C	D	C	D	A	B	D	D	A	B	B	B
Que.	13	14	15	16	17	18	19	20	21	22	23	
Ans.	D	C	D	A	D	D	A	D	D	C	A	

LOGICAL VENN DIAGRAM

1. An object is called a subset of another object, if former is a part of latter and such relation is shown by two concentric circle.

(i) Pencil, Stationary (ii) Brinjal, Vegetable (ii) Chair, Furniture

It is very clear from the above relationship that one object is pat of other, and hence all such relationships can be represented by figure below -

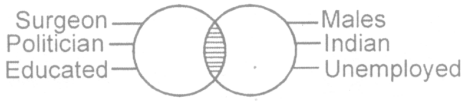


2. An object is said to have an intersection with another object, when two objects share some thing in common.

(i) Surgeon, Males

(ii) Politician, Indian

(iii) Educated, Unemployed



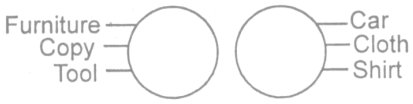
All the three relationship given above have something in common as some surgeons can be male and some female, some politician may be Indian and some may belong to other countries, educated may be employed and unemployed as well. And all the three relationships can be represented by figure above.

3. Two objects are said to be disjoint when neither one is subset of another nor they share anything in common. In other words, totally unrelated object fall under this type of relationship

(i) Furniture, Car

(ii) Copy, Cloth

(iii) Tool, Shirt



It is clear from the above relationship hat both the objects are unrelated to each other, and hence can be represented diagrammatically as shown in figure above.

From the above discussion we observe that representation of relationship of two objects is not typical if students follows the above points. But representation of three objects diagrammatically pose slight problem before the students. A variety of such relationship is being discussed in the following examples.

Direction : (1 to 4) Each of these questions given blow contains three group of things. you are to choose from the following five numbered diagrams, a diagram that depicts the correct relationship among the three groups of thing in each question.

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

Ex.1 Moon, Earth, Universe

Ex.2 India, Pakistan, Asia

Ex.3 Batsman, Cricket, Stick

Ex.4 Book, Pen, Pencil

Sol (1 to 4) :

1. Moon and Earth, are the parts of universe and therefore are subsets of universe and hence this relationship is represented by diagram A).

2. India and Pakistan are the subsets of Asia. Hence, option (A) represents this relationship.

3. Batsman is a subset of Cricket and, Stick is something unrelated to Cricket, therefore, our answer is (D).

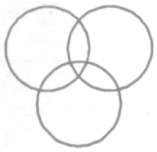
4. Book, Pen, Pencil are neither subset of one another nor have anything in common. Therefore, our answer is (C).

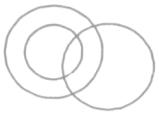
Ex.5 Which of the following diagram correctly represents the relationship among Tennis Fans, Cricket players and Students.

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

Sol. (A) From the relationship given in the question, we observe that each of the objects carries something in commo0n to one another. A Tennis fan can be a cricket player as well as student. Hence Diagram (A) represents this relationship.

Ex.6 Which of the following diagrams correctly represents the relationship among smokers, bidi smokers, cancer patients.


(A)

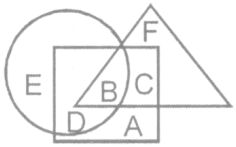

(B)


(C)


(D)

Sol. (B) Bidi smokers is a subset of smokers and cancer patient may be a smoker, bidi smoker and non-smoker. Hence third object shares a common relationship with first and second object as well.

Directions : (7 to 12) In the following diagram, three classes of populations are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.



Ex.7 Married persons living in joint families but not working as school teachers are represented by
(A) C (B) F (C) D (D) A

Ex.8 Persons who live in joint families, are unmarried and who do into work school teachers are represented by
(A) C (B) B (C) E (D) D

Ex.9 Married teachers living in joint families are represented by
(A) C (B) B (C) D (D) A

Ex.10 School teachers who are married but do not live in joint families are represented by
(A) C (B) F (C) A (D) D

Ex.11 School teachers who are neither married nor do live in joint families are represented by
(A) F (B) C (C) B (D) A

Sol. (7 to 11)

7. (C) Married persons living in joint families are presented by the region common to the square and the circle i.e., D and B. But, according to the given conditions, the persons should not be school teachers. So, B is to be excluded. Hence, the required condition is denoted by region D.

8. (C) Persons living in joint families are represented by the circle. According to the given conditions, the persons should be unmarried and not working as school teachers. So, the region should not be a part of either the square of the triangle. Thus, the given conditions are satisfied by the regions E.

9. (B) Married teachers are represented by the region common to the square and the triangle i.e., B and C. But, according to the given conditions, the persons should be living in joint families. So, the required regions should be a part of the circle. Since B lies inside the circle, so the given conditions are satisfied by the persons denoted by the regions B.

10. (A) As in the above questions, married teachers are represented by B and C. Bit. here, the given conditions lay down that the persons should not be living in joint families. So, the required regions should lie outside the circle. Since C lies outside the circle, so the given conditions are satisfied by the person denoted by the regions C.

11. (A) School teacher are represented by the triangle. But according to the given conditions, persons are neither married nor do they live in joint families. So, the regions should to be a part of either the square or the circle. Such a region is F.

PRACTICE EXERCISE

Directions : (1 to 2) Each questions below has three items having certain relationship among them. The same relationship is expressed by sets of circles, each circle representing one item irrespective of its size. Match the item with right set of circles.

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

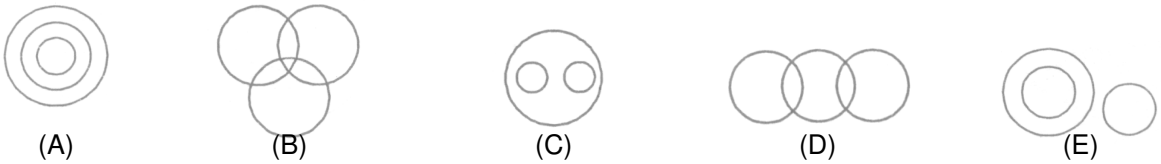
1. Women, Married persons, Wives who work.

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

2. Computer skilled, Graduates, Employed.

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

Directions : (3 to 4) Out of the four alternatives in each of the following questions, three alternatives are such that the three words in each are related among themselves in one of the five ways represented by (A), (B), (C), (D) and (E) below, And one of the alternative represented a relationship which is not represented by any of the figures given below. The relationship that complies this condition is your answer.

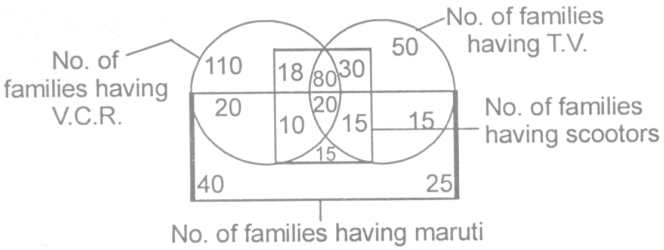


(A) (B) (C) (D) (E)

3. (A) Animal, Mammal, Cow (B) Colour, Cloth, Merchant
(C) Colour, Red, Blue (D) Male, Horse, Mare

4. (A) Periodicals, Weekly, Book (D) Mineral, Copper, Wood
(C) Doctors, Human beings, Married people (D) Army, Doctors, Engineers

Directions : (5 to 9) Study the figure below and answer the following questions.



5. Find out the number of families which have all the four things mentioned in the diagram.
(A) 40 (B) 30 (C) 35 (D) 20

6. Find out the number of families which have scoters
(A) 145 (B) 100 (C) 188 (D) 240

7. Find out the number of families which have V.C.R. and T.V. both
(A) 84 (B) 24 (C) 104 (D) 100

8. Find out the number of families which have only one thing, that is, either V.C.R. or T.C. or Scooter or Maruti.
(A) 160 (B) 184 (C) 225 (D) 254

9. Find out the number of families which have T.V. and scooter both but have neither V.C.R. nor Maruti.
(A) 15 (B) 30 (C) 4 (D) 50

Directions : (10 to 12) Each questions below contains three groups of things. You are to choose from the following five numbered diagrams, the diagram that depicts the correct relationship among the three groups of thins in each question.

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

10. Vegetable, Apple, Spinach

11. Clever, Punctual, Poor

12. Copper, Cobalt, Silver

Directions : (13 to 15) in each of the following questions, select the diagram out of the five that best represents the relationship among the items given in the questions.

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

13. Doctor, Lawyer, Male

14. Man, Husband, Son

15. Female, Medicine, Physician

Directions :L (16 to 20) Out of the four alternatives in each of the following questions, three alternatives are such that the three words in each are related among themselves in one of the five ways represented by (A), (B), (C), (D) and (E) below, And one of the alternatives represents a relationship which is not represented by any of the figures given below. The relationship that complies this conditions is your answer.

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

16. (A) Army, General, Colonel (B) Boy, Student, Player
(C) Painter, Scholar, Table (D) Man, Typist, Peon

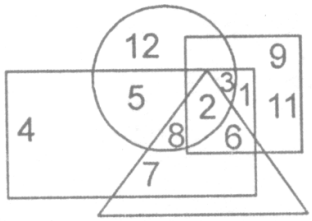
17. (A) Hen, Dog, Cat (B) Body, Ear, Mouth
(C) Bed, Ward, Nurse (D) Tiger, Animal, Carnivorous

18. (A) Mineral, Iron, Copper (B) Dean, Painter, Singer
(C) Seed, Leaf, Root (D) Piston, Engine, Wheel

19. (A) Direction, Engineer, Musician (B) Apple, Orange, Mango
(C) Fruit, Mango, Grass (D) Oxygen, Air, Water

20. (A) Atmosphere, Air, Oxygen (B) Boy, Girl, Student
(C) Man, Worker, Garden (D) Animal, Dog, Cat

Directions : (21 to 24) Read the following information carefully and answer the questions based on them : The circle represents poor boys, the square educated boys, the triangle represents the boys who are employed somewhere and the rectangle represents those who help in the family business. Each section of the diagram is numbered.



21. Which number represents those poor boys who help in family business but are not educated or employed elsewhere ?
(A) 2 (B) 3 (C) 4 (D) 5

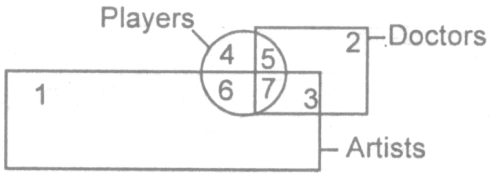
22. Which number represents the group of educated poor boys who are employed somewhere but do not help in family business ?
(A) 3 (B) 11 (C) 2 (D) None of these

23. Which section does number 12 represent ?
(A) Uneducated poor boys who do not help in family business
(B) Educated poor boys employed in service
(C) Uneducated boys who help in family business
(D) Educated poor boys who help in family business.

24. Which number represents that section of poor boys who are neither educated nor are in any employment or have any family business ?

(A) 5 (B) 1 (C) 11 (D) 12

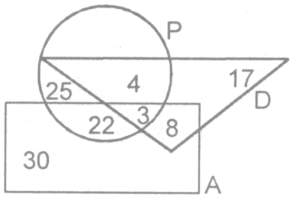
25. Which numbered space in the figure, represents doctors who are players as well as artists ?



(A) 2 (B) 3 (C) 6 (D) 7

Directions : (26 to 26) Study the following figure carefully and answer the questions :

The triangle represented doctors. The circle represents players and the rectangle represents artists.



26. How many doctors are both players and artists ?

(A) 6 (B) 8 (C) 4 (D) 3

27. How many artists are players ?

(A) 30 (B) 29 (C) 25 (D) 17

28. How many artists are neither players nor doctors ?

(A) 29 (B) 30 (C) 22 (D) 8

29. How many doctors are neither players nor artists ?

(A) 17 (B) 30 (C) 8 (D) 19

ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	B	B	C	D	C	D	C	B	C	A	B	D	C	B
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Ans.	C	A	C	B	C	D	D	A	D	D	D	C	B	A	

THE CALENDAR

CONCEPT :

We are to find the day of the week on a mentioned date. Certain concept are defined as under.

ODD DAYS :

The no. of days exceeding the complete no. of weeks in a duration is the no. of odd days during that duration.

ORDINARY YEAR :

An ordinary year has 365 days.

LEAP YEAR :

A leap year has 366 days. Every year which is divisible by 4 is called as leap year. For example 1200, 1600, 1992, 2004, etc. are all leap years.

IMPORTANT REMARK :

The First year of every century year ending in 00's but not a multiple of 400 is not considered a leap year. For example 900, 1000, 1100, 1300, 1400, 1500, 1700, 1800, 1900, 2100, are not leap years.

COUNTING OF ODD DAYS :

(i) Every Ordinary years has 365 days = 52 weeks + 1 day $\therefore$ (ordinary year has 1 odd day).

(ii) Every leap year 366 days = 52 weeks + 2 days $\therefore$ (leap year has 2 odd days).

(iii) 100 years = 76 ordinary years + 24 leap years (The year 100 is not a leap year)

= 76 odd days + 2 × 24 odd days $\Rightarrow$ 124 odd days.

$\frac{124}{7} = 5$ (Remainder) = 05 odd days

Similarly, 200 years = 10 odd days = 03 odd days

300 years = $\frac{15}{7}$ = 01 odd day

400 years = $\frac{20+(1)}{7}$ = 0 odd days {1 is added as 400 is a leap year}

Similarly, 800, 1200, 1600, 2000, 2400 years contain 0 odd days

COUNTING OF DAYS :

After counting the odd days, we find the day according to the no. of days $\rightarrow$ Sunday for 0 odd day, Monday for 01 odd day and so on.

IMPORTANT NOTES :

(i) In an Ord. Year, First & last day of the year are the same.

Ex. If 1 Jan is Friday than 31 Dec. will also have Friday.

(ii) For a leap year, if first day is Monday than last day will be Tuesday for the same year.

(iii) Calendar year 1 Jan to 31 Dec. Financial year 1 April to 31 March.

(iv) The day on which calendar Started i.e., 1 Jan. 001 was Monday

(v) In a Leap year, February is of 29 days. In an ordinary year, February has 28 days.

Ordinary Year – 365 days		**Leap year – 366 days**	
January	31	January	31
February	28	February	29
March	31	March	31
April	30	April	30
May	31	May	31
June	30	June	30
Total	**181 days**	**Total**	**182 days**
July	31	July	31
August	31	August	31
September	30	September	30
October	31	October	31
November	30	November	30
December	31	December	31
Total	**184 days**	**Total**	**184 days**

ILLUSTRATIONS :

Ex.1 Find the day of the week on 16 January, 1969.

Sol. 1600 years have **'0'** odd day .....(A)

300 years have **'1'** odd day ..... (B)

68 years have 17 leap years and 51 ordinary years.

Thus = $(17 \times 2 + 51 \times 1) = 85$ odd days

$\cong$ **'01'** odd day .....(C)

16 January has = **'02'** odd days .....(D)

Adding (A) + (B) + (C) + (D),

We get, 0 + 01 + 01 + 02 = 04 odd days

Ans. Thursday

Ex.2 Find the day of the week on 18 July, 1776 (leap year)

Sol. Here 1600 years have **'0'** odd day .....(A).

100 years have **'5'** odd days .....(B)

75 years = (18 leap years + 57 ordinary years)

= (18 × 2 + 57 × 1)

= 93 odd days

= (7 × 13 + 2) = **'2'** odd days .....(C)

Now, the no. of days from 1st January to 18 July, 1776

= 182 + 18 = 200 days

= (28 × 7 + 4) days = **'4'** odd days ..... (D)

Adding (A) + (B) + (C) + (D),

We get, 0 + 5 + 2 + 4 = 04 odd days

Ans. Thursday

Ex.3 On what dates of October, 1975 did Tuesday fall ?

Sol. For determining the dates, we find the days on 1st Oct, 1975.

1600 years have **'0'** odd days .....(A).

300 years have **'01'** odd days .....(B)

74 years have (18 leap years + 56 ordinary years)

2 × 18 + 1 × 56 = 92 odd days

= **'01'** odd days .....(C)

Days from 1st January to 1st Oct., 1975

1st Jan - 30 June + 1st July to 1st Oct.

181 + 31 + 31 + 30 + 1 = 274 days

= **'01** odd days ....(D) (274/7 = 01 days)

Adding (A) + (B) + (C) + (D) = 0 + 01 + 01 + 01 = **'03'** odd days

Ans. Wednesday (1st Oct), hence, 7, 14, 21, 28, Oct. will Tuesday fall

Ex04 Calendar for 1995 will serve for 2006, prove ?

Sol. The Calendar for 1995 and 2006 will be the same, if day on 1st January of both the years is the same. This is possible only if the total odd days between 31st Dec. 1994 and 31st Des. 2005 is 0. [one day before both the years as we want to know the day on 1st January of both the years i.e. same]

During this period, we have

3 *leap years* ***and*** *08 ordinary years*

(1996, 2000, 2004) (1995, 1997, 1998, 1999, 2001, 2002, 2003, 2005)

Total odd days = (2 × 3 + 1 × 8) = 14 = odd days **(Thus Proved)**

Ex.5 The year next of 1996 having the same Calendar will be -

Sol. 1996 1997 1998 1999 2000 2001 2002 2003

2 1 1 1 2

Total = **2 + 1 + 1 + 1 + 2 = 7 = 0 odd days**

Hence, year 2001 will have the same calendar as year 1996.

Ex.6 Prove that last day of a century cannot be Tuesday, Thursday or Saturday.

Sol. 100 years have = 5 odd days ∴ Last days of Ist century is Friday

200 years have = 10 odd days ∴ Last day of IIst century is Wednesday

= 3 odd days

300 years have = 15 odd days ∴ Last day of IIIrd century is Monday

= 01 odd day

400 years have = (5 × 4 + 1) Last day of 4th century is Sunday

= 21 odd days

= 0 odd days

Since the order keeps on cycling, we see that the lat day of the century cannot be Tuesday, Thursday or Saturday.

Tables : For calculating odd days

Month	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Odd days	3	0/1 ord./Leap yr	3	2	3	2	3	3	2	3	2	3

Months of years	**Ist three months 1 Jan to 31 March**	**IInd Three months 1 Apr to 30 June**	**IIIrd three months 1 July to 30 Sep.**	**Ivth (last) three months**	**Total year 1 Jan to 31 Dec.**
Total days	90 / 91 ord / leap	91	92	92	365/366 ord./leap
Odd days	6 / 0 ord./leap	0 odd day	1 odd day	1 odd day	1 / 2 odd days

PRACTICE EXERCISE

1. Find the day of the week on 26 January, 1950.

(A) Tuesday (B) Friday (C) Wednesday (D) Thursday

2. Which two months in a year have the same calendar ?

(A) June, October (B) April, November (C) April, July (D) October, December

3. Are the years 900 and 1000 leap years ?

(A) Yes (B) No (C) Can't say (D) None of these

4. If it was Saturday on 17th November, 1962 what will be the day on 22nd November, 1964 ?

(A) Monday (B) Tuesday (C) Wednesday (D) Sunday

5. Sangeeta remembers that her father, birthday was certainly after eighth but before thirteenth of December. Her sister Natasha remembers that their father's birthday was definitely after ninth but before fourteenth of December. On which date of December was their father's birthday ?

(A) 10th (B) 11th (C) 12th (D) Data inadequate

6. Find the day of the week on 15 August, 1947.

(A) Tuesday (B) Friday (C) Wednesday (D) Thursday

7. Karan was born on Saturday 22nd March 1982. On what day of the week was he 14 years 7 months and 8 days of age ?

(A) Sunday (B) Tuesday (C) Wednesday (D) Monday

8. If on 14 day after 5th march be Wednesday, what day of the week will fall on 10th Dec. of the same year ?

(A) Friday (B) Wednesday (C) Thursday (D) Tuesday

9. If the day before yesterday was Saturday, what day will fall on the day after tomorrow ?

(A) Friday (B) Thursday (C) Wednesday (D) Tuesday

10. If February 1, 1996 is Wednesday, what ay is March 10, 1996 ?

(A) Monday (B) Sunday (C) Saturday (D) Friday

11. If the seventh day of a month is three days earlier than Friday, what day will it be on the nineteenth day of the month ?

(A) Sunday (B) Monday (C) Wednesday (D) Friday

12. Mohini went to the moves nine days ago. She goes to the moves only on Thursday. What day of the week is today ?

(A) Thursday (B) Saturday (C) Sunday (D) Tuesday

ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	D	C	B	D	D	B	C	B	C	C	A	B

CLOCK TEST

IMPORTANT NOTES :

(i) Minutes hand and hour hand coincides once in every hour. They coincide 11 times in 12 hours & 22 times in 24 hours. They don't coincide between 12 & 1 O' Clock.

(ii) Minute hand & hour hand are opposite once in every hour. Then the two hands are opposite in direction, distance between them is of 30 minutes. They make an angle of 180^0 with each other. They do it 11 times in 12 hours & 22 times in 24 hours. It doesn't happen between 6 to 7 o'clock.

(iii) Both hands (Minutes & hour) are perpendicular twice in every hour. They make an angle of 9^0. 22 times in 12 hours and 44 times in 24 hours.

(iv) In One Minute, hour hand moves $1/2^0$ & Minute hand moves 6^0. In one hour, hour hand moves 30^0 & minute hand moves 360^0.

(v) In an hour, minute hand moves 55 minutes ahead of hour hand.

HANDS COINCIDE :

Ex.1 At what time between 3 & 4 will the two hands coincide ?

Sol. At 3 o'clock the distance between the two hands is 15 minutes. When they are at zero minutes distance, they are coincide to each other. The time taken = 15 minutes.

$\therefore$ minute hand is 55 minutes ahead of hour hand in 60 minutes.

_____1 minutes _____ $\frac{60}{55}$

_____15 minutes _____ $\frac{60\times15}{55} = 3 \& 16\frac{4}{11}\text{minute}$

HANDS ARE OPPOSITE :

Ex2. At what time between 2 & 3 will the two hands are opposite ?

Sol. At 2 o' clock the distance between the two hands is 10 minutes. When they are at 30 minutes distance, they are opposite to each other. The time taken (30 + 10) = 4 minutes

$\therefore$ minute had is 55 minutes ahead of hour hand in 60 minutes.

_____ 1 minute _____ $\frac{60}{55}$

_____40 minutes _____ $\frac{60\times40}{55} = 2 \ \& \ 43\frac{7}{11}\text{minute}$

Table $\longrightarrow$ Hands are opposite

1 & 2	2 & 3	3 & 4	4 & 5	5 & 6	6 & 7	7 & 8	8 & 9	9 & 10	1 & 11	11 & 12	12 & 1
1 & $38\frac{2}{11}$	2 & $43\frac{7}{11}$	3 & $49\frac{1}{11}$	4 & $54\frac{6}{11}$	6	6	7 & $5\frac{5}{11}$	8 & $10\frac{10}{11}$	8 & $16\frac{4}{11}$	10 & $21\frac{9}{11}$	11 & $27\frac{3}{11}$	12 & $32\frac{8}{11}$

HANDS ARE PERPENDICULAR :

Ex.3 At what time between 4 & 5 will the hands are perpendicular ?

Sol. At 4 o'clock the distance between the two hands is 20 minutes. When they are at 15 minutes distance, they are perpendicular to each other. The time taken 5 and (5 + 30) = 5 and 35 minutes.

$\therefore$ minutes hand is 55 minutes ahead of hour hand in 60 minutes.

_____1 minutes _____ $\frac{60}{55}$

_____5 minutes _____ $\frac{60\times5}{55} = 4\,\&\,5\frac{5}{11}\,\text{minute}$

And _____35 minutes _____ $\frac{60\times35}{55} = 4\ \&\ 38\frac{2}{11}\ \text{minute}$

MIRROR IMAGE OF CLOCK :

1. If the time is between 1 to 11 o; clock, then to find the mirror image, time is subtracted by 11 : 60.

2. If the time is between 11 to 1, then to find the mirror image, time is subtracted by 23 : 60

Ex.4 The time in the clock is 4 : 46, what is the mirror image ?

Sol. 11 : 60 - 4 : 46 = 7 : 14

or

12 - 4 : 46 = 7 : 14

Ex.5 The time in the clock is 12 : 35, then its mirror image will be -

Sol. 23 : 60 - 12 : 35

= 11 : 25

TO FIND THE ANGLE BETWEEN TWO HANDS :

Minute hand moves 30^0 in 5 minutes & 360^0 in 1 hour i.e., It moves 6^0 in One Minute

Hour Hand moves 30^0 in 60 minutes

In one minute, it moves 0.5^0

Angle are of two types :

Positive angle : It is obtained by moving from hour hand to minute Hand.

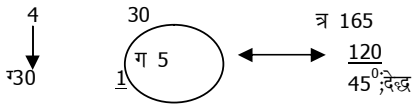
Negative angle : It is obtained by moving from minute hand to hour hand.

Note : Both type of angles are 36^0 in total. If one angle is known, other can be obtained by subtracting from 360^0

Formula : minutes of the given time are multiplied by $5\frac{1}{2}$..... a, Hour hand is multiplied by 30 ..... b, then a - b is the angle required.

Ex.6 AT 4 : 30, what is the angle formed between hour hand & minute Hand ?

Sol.



Ex.7 At 3 : 15 what is the angle formed between hour hand & minute hand ?

$$\begin{array}{l} 3 \\ \downarrow \\ \times 30 \\ \hline 90 \end{array} \qquad \begin{array}{l} 15 \\ \times 5\frac{1}{2} = 82\frac{1}{2}^\circ \end{array}$$

Sol.

$$\frac{(-)90}{-7\frac{1}{2}^\circ}$$

$$360 - 7\frac{1}{2}^\circ = 352\frac{1}{2}^\circ$$

PRACTIVE EXERCISE

1. At what time are the hand of a clock together between 5 and 6 ?

(A) $33\frac{3}{11}$ min. past 5 (B) $28\frac{3}{11}$ min. pat 5 (C) $27\frac{3}{11}$ min. past 5 (D) $26\frac{3}{11}$ min. past 5

2. At what time between 9 and 10 will the hands of a clock be in the straight line, but not together ?

(A) 16 minutes past 9 (B) $16\frac{4}{11}$ minutes past 9

(C) $16\frac{6}{11}$ minutes past 9 (D) $16\frac{9}{11}$ minutes past 9

3. At what time between 5 & 5 : 30 will be hands of a clock be at right angle ?

(A) $10\frac{10}{11}$ minutes past 5 (B) $11\frac{5}{11}$ minutes past 5

(C) $9\frac{10}{11}$ minutes past 5 (D) $10\frac{9}{11}$ minutes past 5

4. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop ?

(A) 8.30 a.m. (B) 4.85 a.m. (C) 8.55 a.m. (D) Data inadequate

5. The priest told the devotee, "The temple bell is rung at regular intervals of 45 minutes. The last bell was rung five minutes ago. The next bell is due to be rung at 7.45 a.m. "At what time did the priest give this information to the devotee ?

(A) 7.40 a.m. (B) 7.05 a.m. (C) 6.55 a.m. (D) none of these

6. There are twenty people working in an office. The first group of five works between 8.00 A.M. and 2.00 P.M. The second group of ten works between 10^0 A.M. and 4.00 P.M. And the third group of five works between 12 noon and 6.00 P.<. There are three computer in the office which all the employees frequently use. During which of the following hours the computers are likely to be used most ?

(A) 10.00 A.M. - 12 noon (B) 12 noon - 2.00 P.M.

(C) 1.00 P.M. - 3.00 P.M. (D) 2.00 P.M. - 4.00 P.M.

7. A tired worker slept at 7.45 p.m. If he rose at 12 noon, for how many hours did he sleep ?

(A) 5 hours 15 min. (B) 16 hours 15 min. (C) 12 hours (D) 6 hours 45 min.

8. How many time are the hands of a clocks perpendicular in a day ?

(A) 42 (B) 48 (C) 44 (D) 46

9. If a clock shows 04 : 28 then its mirror image will be ?

(A) 07 : 42 (B) 07 : 32 (C) 08 : 32 (D) 08 : 42

10. A watch, which gain uniformly, is 3 minutes slow at noon an Monday and is 3 minutes 48 seconds fast at 2 p.m. on the following Monday. What time it was correct ?

(A) 2 p.m. On Tuesday (B) 2 p.m. On Wednesday

(C) 3 p.m. On Thursday (D) 1 p.m. On Friday.

11. How many times are the hands of a clocks coincide in a day ?

(A) 10 (B) 11 (C) 12 (D) 22

12. At what time between 2 and 3 O'clock the hands of a clock will make an angle of 160^0 ?

(A) 20 minutes past 2 (B) 30 minutes past 2 (C) 40 minutes past 2 (D) 50 minutes past 2

13. Ashish leaves his house at 20 minutes to seven in the morning, reaches Kunal's house in 25 minutes, they finish their breakfast in another 15 minutes and leave for their office which takes another 35 minutes. At what time do they leave Kunal's house to each their office ?

(A) 7.40 am (B) 7.20 am (C) 7.45 cm (D) 8.15 cm

14. The train for Lucknow leaves every two and a half hours from New Delhi Railway Station. An announcement was made at the station that the train for Lucknow had left 40 minutes ago and the next train will leave at 18.00 hrs. At what time was the announcement made ?

(A) 15.30 hrs (B) 17.10 hrs (C) 16.00 hrs (D) None of these

15. A monkey climbs 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 a.m., at what time will he first touch a flag at 120 feet from the ground ?

(A) 4 p.m. (B) 5 p.m. (C) 6 p.m. (D) None of these

16. If the two incorrect watches are set at 12 : 00 noon at correct time, when will both the watches show the correct time for the first time given that the fist watch gains 1 min in 1 hour and second watch loses 4 min in 2 hours :

(A) 6 pm, 25 days later (B) 12 : 00 noon, 30 days later

(C) 12 noon, 15 days later (D) 6 cm 45 days later

17. Rajeev and Sanjeev are too close friends Rajeev's watch gains 1 minute in an hour and Sanjeev's watch loses 2 minutes in an hour. Once they set both the watches at 12 : 00 noon, with my correct watch. When will the two incorrect watches of Rajeev and Sanjeev show the same time together ?

(A) 8 days later (B) 10 days later (C) 6 days later (D) can't be determined

18. Ramu purchased a second hand Swiss watch which is very costly. In this watch the minute-hand and hour hand coincide after every $65\frac{3}{11}$ minutes. How much time does the watch lose or gain per day ?

(A) 4 min (B) 5 min (C) 4 min, 20 sec (D) none of these

Directions : (19 to 20) : A 12 dial clock has its minute had defective. Whenever it touches dial 12, it immediately falls down to 6 instead of running smoothly (the hour hand remains unaffected during that fall). It was set right at 12 'O' clock in the noon.

19. What was the actual time when the minute hand of the clock touched dial 9 for the 5th time ?

(A) 2 : 15 (B) 3 : 00 (C) 5 : 15 (C) 6 : 45

20. If the actual time is 10 : 10, what is the position of the hour hand in that defective clock ?

(A) Between 2 and 3 (B) Between 4 and 5 (C) Between 10 and 11 (D) Between 3 an d 4

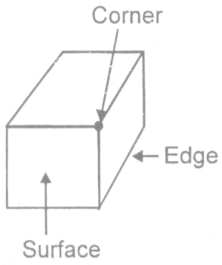
ANSWERS

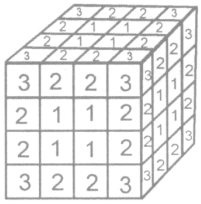
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	C	B	A	B	B	B	B	C	B	C
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	D	C	B	D	C	B	B	A	A	C

CUBES

CUBES :

A cube is three dimensional figure, having 8 corners, 6 surfaces and 12 edges. If a cube is painted on all of its surfaces with any colour and further divided into various smaller cubes, we get following results. Smaller cubes with three surfaces painted will be present on the corners of the big cube.





Smaller cubes with two surface painted will be present on the edges of the big cube. Smaller cubes with one surface painted will be present on the surfaces of the big cube. Smaller cubes with no surface painted will be present inside the big cube.

If a cube is painted on all of its surfaces with a colour and then divided into smaller cubes of equal size then after separation, number of smaller cubes so obtained will be calculated as under :

Number of smaller cubes with three surfaces painted = 8

Number of smaller cubes with two surfaces painted = $(n - 2)^2 \times 12$

Number of smaller cubes with one surfaces painted = $(n - 2)^2 \times 6$

Number of smaller cubes with no surfaces painted = $(n - 2)^3$

Where n = No of division on the surfaces of the bigger cube

$$= \frac{\text{length edge of big cube}}{\text{length of edge of one smaller cube}}$$

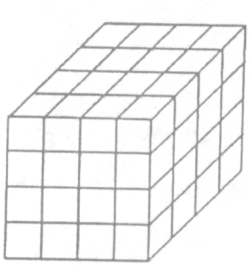
TYPE I :

If a cube is painted on all of its surfaces with single colour and then divided into various smaller cubes of equal size.

Directions : A cube of side 4 cm. is painted black on all of its surfaces and then divided into various smaller cubes of side 1 cm each. The smaller cubes so obtained are separated.

Total cubes of obtained = $\frac{4\times4\times4}{1\times1\times1} = 64$

Here $n = \frac{\text{side of big cube}}{\text{side of small cube}} = \frac{4}{1} = 4$



1. Number of smaller cubes with three surfaces painted = 8

2. Number of smaller cubes with two surfaces painted = $(n - 2) \times 12$

$= (4 - 2) \times 12 = 24$

3. Number of smaller cubes with one surfaces painted = $(n - 2)^2 \times 6$

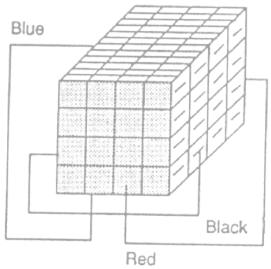
$= (4 - 2)^2 \times 6 = 4 \times 6 = 24$

4. Number of smaller cubes with no surface painted = $(n - 2)^3 = (4 - 2)^3 = (2)^3 = 8$

TYPE II :

If a cube is painted on all of its surfaces with different colours and then divided into various smaller cubes of equal size.

Directions : A cube of side 4 cm is painted black on the pair of one opposite surfaces, blue, on the pair of another opposite surfaces and red on remaining pair of opposite surfaces, the cube is now divided into smaller cube of equal side of 1 cm each.



1. Number of smaller cubes with three surfaces painted = 8

(These smaller cubes will have all three surfaces painted with different colour blue, black and red.)

2. Number of smaller cubes with two surfaces painted = 24. And out of this -
(a) Number of cubes with two surfaces painted with black and blue colour = 8.
(b) Number of cubes with two surfaces painted with blue and red colour = 8.
(c) Number of cubes with two surfaces painted with black and red colour = 8.

3. Number of smaller cubes with one surface painted = 24. And out of this -
(a) Number of cubes with one surface painted with black colour = 8.
(b) Number of cubes with one surface painted with blue colour = 8.
(c) Number of cubes with one surface painted with red colour = 8.

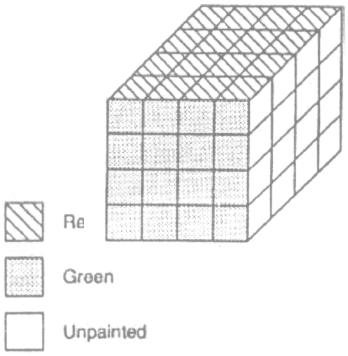
TYPE III :

If a cube is painted on its surfaces in such a way that one pair of opposite surfaces is left unpainted.

Directions : A cube of side 4 cm is painted red on the pair of one opposite surfaces, green on the pair of another opposite surfaces and one pair of opposite surfaces is left unpainted. Now the cube is divided into 64 smaller cubes of side 1 cm each.

1. Number of smaller cubes with three surfaces painted = 0 (Because each smaller cube at the corner is attached to a surface which is unpainted.)

2. Number of smaller cubes with two surfaces painted = Number of cubes present at the corners + Numbers of cubes present at 4 edges
$= 8 + (n - 2) \times 4$
$= 8 + 8 = 16$



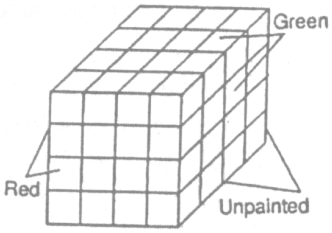
3. Number of smaller cubes with one surface painted.
= Number of cubes present at the 8 edges + number of cubes present at the four surfaces.
$= (n - 2) \times 8 + (n - 2)^2 \times 4$
$= (2 \times 8 + 4 \times 4 = 16 + 16 = 32$

4. Number of smaller cubes with no side painted
= Number of cube on the two unpainted surfaces + number of cubes present inside the cube.
$= (n - 2)^2 \times 2 + (n - 2)^3$
$= 4 \times 2 + (2)^3$
$= 8 + 8 = 16$

TYPE IV:

If a cube is painted on its surfaces in such a way that one pair of adjacent surfaces is left unpainted/

Directions : A cube of side 4 cm is painted red on the pair of one adjacent surfaces, green on the pair of other adjacent surfaces and two adjacent surfaces are left unpainted. Now the cube is divided into 64 smaller cubes of side 1 cm each.



1. Number of smaller cubes with three surfaces painted = Number of smaller cubes at two corners = 2

2. Number of smaller cubes with two surfaces painted = Number of smaller cubes at four corners + Number of smaller cubes at 5 edges.

$= 4 + (n - 2) \times 5 = 4 + 2 \times 5$

$=4 + 10 = 14$

3. Number of smaller cubes with one surface painted = Number of smaller cubes at four surfaces + Number of smaller cubes at 6 edges + Number of smaller cubes at two corners.

$= (n - 2)^2 \times 4 + (n - 2) \times 6 + 2$

$= 4 \times 4 + 2 \times + 2 = 16 + 12 = 28 + 2 = 30$

4. Number of smaller cubes with no surfaces painted = Number of smaller cubes from inside the big cube + Number of cubes at two surfaces + Numbers of cubes at one edge.

$= (n - 2)^2 + (n - 2)^2 \times 2 + (n - 2)$

$= (2)^2 + (2)^2 \times + 2$

$= 8 + 8 + 2 = 18$

PRACTIVE EXERCISE

Directions : (1 to 5) A cube is coloured orange on one face, pink on the opposite face, brown on one face and silver on a face adjacent to the brown face. The other two faces are left uncoloured. It is then cut into 125 smaller cubes of equal size. Now answer the following questions based on the above statements

1. How many cubes have at least one face coloured pink ?

(A) 1 (B) 9 (C) 16 (D) 25

2. How many cubes have all the faces uncloured ?

(A) 24 (B) 36 (C) 48 (D) 64

3. How many cubes have at least two faces coloured ?

(A) 19 (B) 20 (C) 21 (D) 23

4. How many cubes are coloured orange on one face and have the remaining faces uncoloured ?

(A) 8 (B) 12 (C) 14 (D) 16

5. How many cubes one coloured silver on one face, orange or pink on another face and have four uncoloured faces ?

(A) 8 (B) 10 (C) 12 (D) 16

Directions : (6 to 11) A cube is painted red on two adjacent surfaces and black on the surfaces opposite to red surfaces and green on the remaining faces. Now the cube is cut into sixty four smaller cubes of equal size.

6. How many smaller cubes have only one surface painted ?

(A) 8 (B) 16 (C) 24 (D) 32

7. How many smaller cubes will have to surface painted ?

(A) 0 (B) 4 (C) 8 (D) 16

8. How many smaller cubes have less than three surfaces painted ?

(A) 8 (B) 24 (C) 28 (D) 48

9. How many smaller cubes have three surfaces painted ?
(A) 4 (B) 8 (C) 16 (D) 24

10. How many smaller cubes with two surfaces painted have one face green and one of the adjacent faces black or red ?
(A) 8 (B) 16 (C) 24 (D) 28

11. How many smaller cubes have at least one surface painted with green colour ?
() 8 (B) 24 (C) 32 (D) 56

Directions : (12 to 16) A cube of 4 cm has been painted on its surfaces is such a way that two opposite surfaces have been painted blue and two adjacent surfaces have been painted red. Two remaining surfaces have been left unpainted. Now the cube is cut into smaller cubes of side 1 cm each.

12. How many cubes will have no side painted ?
(A) 18 (B) 16 (C) 22 (D) 8

13. How many cubes will have at least red colour on its surfaces ?
(A) 20 (B) 22 (C) 28 (D) 32

14. How many cubes will have at least blue colour on its surfaces ?
(A) 20 (B) 8 (C) 24 (D) 32

15. How many cubes will have only two surfaces painted with red and blue colour respectively ?
(A) 8 (B) 12 (C) 24 (D) 30

16. How many cubes will have three surfaces coloured ?
(A) 3 (B) 4 (C) 2 (D) 16

Directions : (17 to 26) A solid cube has been painted yellow, blue and black on pairs of opposite faces. The cube in then cut into 36 smaller cubes such that 32 cubes are of the same size while 4 others are of bigger sizes. Also no faces of any of the bigger cubes is painted blue.

17. How many cubes have at least one face painted blue ?
(A) 0 (B) 8 (C) 16 (D) 32

18. How many cubes have only one faces painted ?
(A) 24 (B) 20 (C) 8 (D) 12

19. How many cubes have only two faces painted ?

(A) 24 (B) 20 (C) 16 (D) 8

20. How many cubes have at least two faces painted ?

(A) 36 (B) 34 (C) 28 (D) 24

21. How many cubes have only thee faces painted ?

(A) 8 (B) 4 (C) 2 (D) 0

22. How many cubes do not have any of their faces painted yellow ?

(A) 0 (B) 4 (C) 8 (D) 16

23. How many cubes have at least one of their faces painted black ?

(A) 0 (B) 8 (C) 16 (D) 20

24. How many cubes have at least one of their faces painted yellow or blue ?

(A) 36 (B) 32 (C) 16 (D) 0

25. How many cubes have no face painted ?

(A) 8 (B) 4 (C) 1 (D) 0

26. How many cubes have two faces painted yellow and black respectively ?

(A) 0 (B) 8 (C) 12 (D) 16

Directions : (27 to 31) A cuboids of dimensions (6 cm × 4 cm × 1 cm) is painted black on both the surfaces of dimensions (4 cm × 1 cm), green on the surfaces of dimensions (6 cm × 4 cm). and red on the surfaces of dimensions (6 cm × 1 cm). Now the block is divided into various smaller cubes of side 1 cm, each. The smaller cubes so obtained are separated.

27. How many cubes will have all three colours black, green and red each at least on one side ?

(A) 16 (B) 12 (C) 10 (D) 8

28. How many cubes will be formed ?

(A) 6 (B) 12 (C) 16 (D) 24

29. If cubes having only black as well as green colour are removed then how many cubes will be left ?

(A) 4 (B) 8 (C) 16 (D) 30

30. How many cubes will have 4 coloured sides and 2 sides without colour ?

(A) 8 (B) 4 (C) 16 (D) 10

31. How many cubes will have two sides with green colour and remaining sides without any colour ?

(A) 12 (B) 10 (C) 8 (D) 4

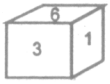
ANSWERS

Que.	1	2	3	4	5	6	7	8	9	10	11
Ans.	D	C	C	D	A	C	C	D	B	B	C
Que.	12	13	14	15	16	17	18	19	20	21	22
Ans.	A	C	D	B	C	D	C	B	C	A	D
Que.	23	24	25	26	27	28	29	30	31		
Ans.	D	A	D	C	A	D	C	B	C		

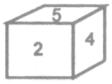
DICES

CATEGORY I :

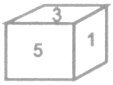
Ex. A dice has been thrown four times and produces following results.



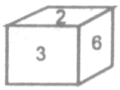
(i)



(ii)



(iii)



(iv)

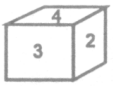
Which number will appear opposite to the number 3 ?

(A) 4 (B) 5 (C) 6 (D) 1

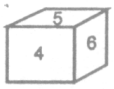
Sol. From the figures (i), (ii) and (iv) we find that numbers 6, 1, 5 and 2 appear on the adjacent surfaces to the number 3. Therefore, number 4 will be opposite to number 3. Hence option (a) is the answer.

CATEGORY II :

Ex. The figures given below show the two different position of a dive. Which number will appear opposite to number 2.



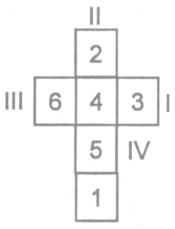
(i)



(ii)

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

Sol. The above question, where only two positions of a dive are given, can easily be solved with the following method.



Step I.

The dice, when unfolded, will appear as shown in the figure given on the right side.

Step II.

Write the common number to both the dice in the middle block. Since common number is 4, hence number 4 will appear in the central block.

Step III.

Consider the figure (i) and write the first number in the anti-clockwise direction of number 4, (common number) in block I and second number in block II. Therefore, numbers 3 and 2 being the first and second number to 4 in anticlockwise directions respectively will appear in block I & II respectively.

Step IV.

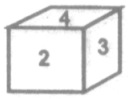
Consider figure (ii) and wire first and second number in the anticlock-wise direction to number 4, (common number) in block (iii) & (IV). Hence number 6 and 5 will appear in the blocks III and IV respectively.

Step V.

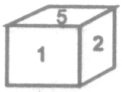
Write remaining number in the remaining block. Therefore, number 1 will come in the remaining block. Now, from the unfolded figures we find that number opposite to 6 is 3, number opposite to 2 is 5 and number opposite to 4 1. Therefore, option (c) is our answer

CATEGORY III :

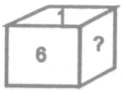
Ex. From the following figures of dice, find which number will come in place of '?'



(i)



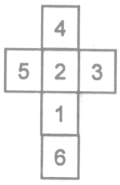
(ii)



(iii)

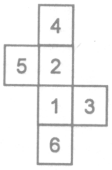
(A) 4 (B) 5 (C) 2 (D) 3

Sol. If the above dice is unfolded, it will look like as the figure (1) given below.



Figur (1)

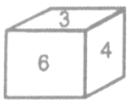
Now the number in place of '?' can be obtained by making a slight change in the figure as given here. Now comparing figure (2) with figure (iii) as above, we et that number in place of ? is 3.



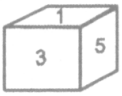
Figur (2)

CATEGORY IV :

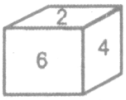
Ex. Which of the following dices is identical to the unfolded figure as shown here ?



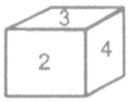
(A)



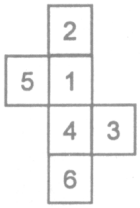
(B)



(C)



(D)



Sol. From the unfolded figure of dice, we find that number opposite to 2 is 4, for 5 it is 3 and for 1 it is 6. From this result we can definitely say that figure (B), (C) and (D) can not be the answer figures as number lying on the opposite pair of surfaces are present on the adjacent surfaces. Hence fig. (A) is our answer.

PRACTICE EXERCISE

1. Which alphabet is opposite D ?

(i)

(ii)

(A) E (B) C (C) F (D) A

2. What should be the number opposite 4 ?

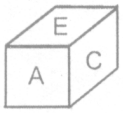
(i)

(ii)

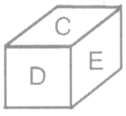
(iii)

(A) 5 (B) 1 (C) 3 (D) 2

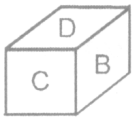
3.



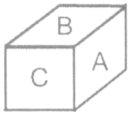
(i)



(ii)



(iii)



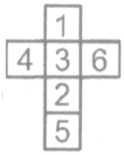
(iv)

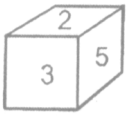
Which letter will be opposite to letter D ?

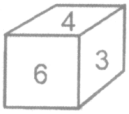
(A) A (B) B (C) E (D) F

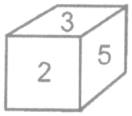
Directions : (4 to 5) The figure (X) given below is the unfolded position of a cubical dice. In each of the following questions this unfolded figure is followed by four different figures of dice. You have to select the figure which is identical to the figure (X).

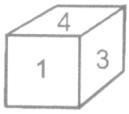
4. (X)



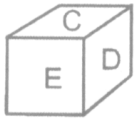
(A) 

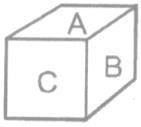
(B) 

(C) 

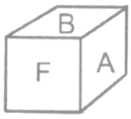
(D) 

5. (X)

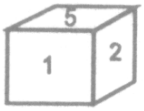
(A) 

(B) 

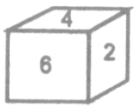
(C) 

(D) 

Directions (6 to 8) In each of the following questions, select the correct option for the question asked.



(i)



(ii)

6. Which number will come opposite to number ?

(A) 5 (B) 1 (C) 6 (D) 3

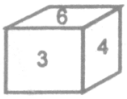
7. Which number will come opposite to number 6 ?

(A) 1 (B) 5 (C) 4 (D) 3

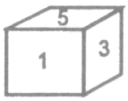
8. Which number will come opposite to number 4 ?

(A) 3 (B) 5 (C) 1 (D) 2

9. On the basis of two figures of dice, you have to tell what number will be on the opposite face of number 5 ?



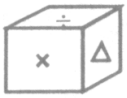
(i)



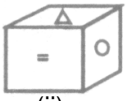
(ii)

(A) 1 (B) 2 (C) 4 (D) 6

10. Which symbol will appear on the opposite surface to the symbol x ?



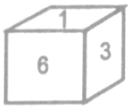
(i)



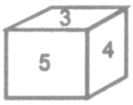
(ii)

(A) ÷ (B) = (X) Δ (D) O

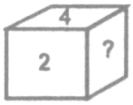
11. Three positions of the same dice are given below. Observe the figures carefully and tell which number will come in place of '?'



(i)



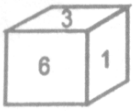
(ii)



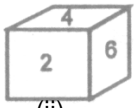
(iii)

(A) 1 (B) 6 (C) 3 (D) 5

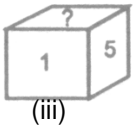
12. On the basis of the following figures you have to tell which number will come in place of '?'



(i)



(ii)

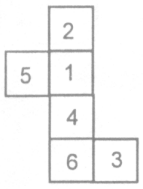


(iii)

(A) 2 (B) 3 (C) 6 (D) 4

Directions : (13 to 15) Choose from the alternatives, the boxes that will be formed when figure (X) is folded :

13. (X)

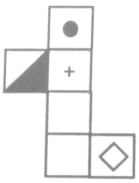


(A)

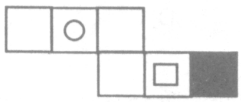
(B)

(C)

(D)

14. (X) 

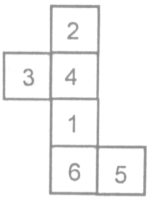
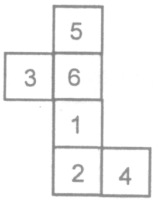
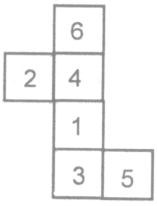
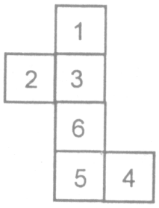
(A)  (B)  (C)  (D) 

15. (x) 

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

Directions : (16) The six faces of a cube have been marked with number 1, 2, 3, 4, 5 and 6 respectively. This cube is rolled down three times. The three positions are given. Choose the figure that will be formed when the cube is unfolded.

16.   

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

17. Which number is opposite 3 in a standard dive given below ?

(A) 1 (B) 4 (C) 5 (D) Can't be determined

18. Which number is opposite 4 ?

(i) (ii)

(A) 5 (B) 3 (C) 2 (D) 1

Directions : (19) In the following questions four positions of the same dice have been shown. You have to seen these figures and select the number opposite to the number as asked in each question.

19.

(i) (ii) (iii) (iv)

Which number is opposite to number 5 ?

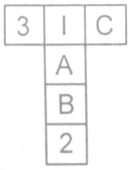
(A) 6 (B) 5 (C) 1 (D) 3

Directions : (20 to 23) In each of the following questions, a diagram has been given which can be folded into a cube. the entries given in the squares indicate the entries on the face of the cube. In each questions a number or a letter has been given on the left. Of the four alternatives given against it, you have to find the one that would appear on the face opposite to it in the cube.

20. Which letter is opposite Q ?

(A) L (B) M (C) N (D) P

21. Which number/letter is opposite 2 ?

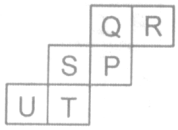


(A) A (B) C (C) 1 (D) 3

22. Which number/letter is opposite O ?

(A) L (B) M (C) N (D) 2

23. Which letter is opposite R ?



(A) P (B) S (C) T (D) U

ANSWERS

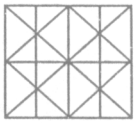
ANSWER KEY												
Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	B	B	A	D	B	D	A	B	C	D	A	B
Que.	13	14	15	16	17	18	19	20	21	22	23	
Ans.	D	B	D	C	B	A	C	C	A	B	B	

FIGURE PARTITION

FIGURE PARTITION :

The chapter on Analytical Reasoning involves the problems relating to the counting of geometrical figures in a given complex figure. The systematic method for determining the number of any particular type of figure by the analysis of the complex figure would be clear from the examples that follow.

Ex.1 What is the number of straight lines in the following figure ?



(A) 11

(B) 14

(C) 16

(D) 17

Sol. (B) The figure is labelled as shown.

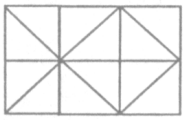
Clearly, there are 3 horizontal liens namely AE, LF and KG.

There are 5 vertical lines : AL, BJ, CI, DH and EG.

There are 6 slanting lines : LC, KE, IF, LI, AG and CF.

Thus, there are 3 + 5 + 6 = 14 straight lines in the figure.

Ex.2 How many squares does the figure have?



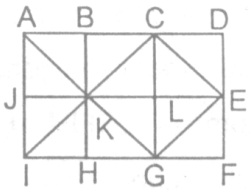
(A) 6

(B) 7

(C) 9

(D) 10

Sol. The figure may be labelled as shown :



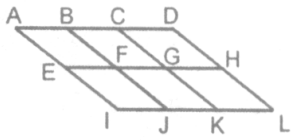
The squares composed to two components each, are ABKJ, BCLK, CDEL, LEFG, KLGH and JKHI. Thus, there are 6 such squares. Only one square, KCEG is composed of four components. Two squares namely, ACGI and BDFH are composed of eight components each. Thus, there are 2 such squares.

∴ There are 6 + 1 + 2 = 9 squares in the given figure.

Ex.3 How many parallelograms are there in the figure below ?

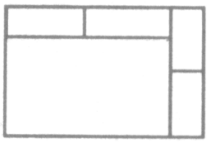
(A) 14 (B) 15
(C) 16 (D) 18

Sol. We can label the figure as shown.



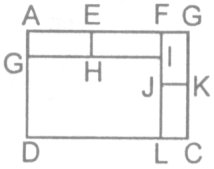
The simplest parallelograms are ABFE, BCGF, CDHG, EFJI, FGKJ and GHKL. These are 6 in number. The parallelograms composed of two components each, are ACGE, BDHF, EGKI, FHLJ, ABJI and CDLK. Thus, there are 7 such parallelograms. The parallelograms composed of four components each, are ACKI and BDLJ. i.e. 2 in number. There is only one parallelograms composed of six components, namely, ADLI. Thus there are 6 + 7 + 2 + 1 = 16 parallelograms in the figure. Hence,

Ex.4 What is the number of rectangles in the following figure ?



(A) 6
(B) 7
(C) 8
(D) 9

Sol. The figure is labelled as shown :



Simplest rectangles are AEHG, EFIH, FBKJ, JKCL and GILD. i.e. there are 5 such rectangles. The rectangles composed of two components each are AFIG and FBCL. Thus, there are 2 such rectangles. Only one rectangles, namely AFLD is composed of 3 components and only one rectangle, namely ABCD is composed of 5 components. Thus, there are 5 + 2 + 1 + 1 = 9 rectangles in the figure.

Ex.5 Determine the number of pentagons in the following figure :

(A) 5
(B) 6
(C) 8
(D) 10

Sol. The figure may be labelled as follows :

In this case, six pentagons have been formed by the combination of three triangles and two rhombuses - ADFHJ, CFHJL, EHJLB, GJLBD, ILBDF and KBDFH. Four other pentagons are formed by the combination of three triangles and one rhombus - LCFHM, LBEHM, BKFHM and BLIFM. Thus, there are 10 pentagons in the figure.