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INTRODUCTION

The word ‘Logic’ is derived from the Greek word ‘Logos’ which means ‘Thoughts in Language’. We can say that ‘Logic’ is the ‘Science of thought’ expressed in language.

The mental recognition of cause-and-effect relationship is called ‘reasoning’. It may be prediction of an event from an observed cause or the inference of a cause from an observed event.

Logical reasoning is a process of passing from the known to the unknown. It is the process of deriving a logical inference from a hypothesis through reasoning. This type of reasoning involves three important attributes, viz: What? Why? How?

Another important factor in logical reasoning is logical deduction. Deriving an inference from units of arguments which are called proposition in logic or deducing an inference from statements is called logical deduction. For example:

(a) Man is mortal
(b) Raveesh is a man.

Therefore, Raveesh is mortal

From statement (a) and (b) we derive a logical conclusion that Raveesh is mortal.

Basic Concepts in Logic

Term means the subject or medicate of a logical proposition. A proposition is the statement of a certain relation between two terms. All propositions either assert or deny something. The subject is that about which an assertion is made and whatever is asserted is called the predicate. The sign of relation between subject and predicate is called copula.

For example, "Man is mortal" is a proposition, the term ‘Man’ is a subject and ‘Mortal’ is a predicate and both terms are joined by the copula "is".

Propositions may be classified as follows:
(a) **Universal**: What is asserted applies to the whole of a subject. Usually, 'AU' is prefixed to such propositions. "All religious man are good" is a *Universal proposition*.

(b) **Particular**: Only part of the subject is covered. Usually, "some" is prefixed in such propositions. "Some steaks are tough" is a particular proposition.

Universal and particular propositions are based on *quantity*. They are further classified on the basis of *quality*, viz affirmative (e.g. Raveesh is an Indian) and *negatives* (Raveesh is not Indian).

Based on quality and quantity, propositions are further classified into:

(a) **Universal affirmative**: "All teetotalers are short lived" affirms something of the whole subject. This is represented by "A".

(b) **Universal negative**: "No politician is rancorous". Something is denied of the whole subject. This is represented by "E".

(c) **Particular affirmative**: "Some professors are hard-working". Something is affirmed of a part of the subject. This is represented by "I".

(d) **Particular negative**: Something is denied of a part of the subject. "Some writers are professionals". This is represented by "O".

Symbols A, E, I and O, above are adopted from first two vowels of "Affirmo" and "Nego". A and I are therefore affirmative and E and O are negative.

**Distribution of Terms**

- A term is distributed when reference is made to all. A term is undistributed when reference is made to an indefinite part of the whole.
- In universal propositions, the subject term is always distributed while in a particular proposition, the subject is undistributed.
- The predicate in ‘A’ proposition is undistributed and the same is true for ‘I’ proposition. Hence affirmative propositions do not distribute their predicate.
In ‘E’ proposition the predicate is distributed and this also applies to ‘O’ proposition.

The universal proposition distributes the subject, while the particular proposition does not distribute the subject. On the other hand, the predicate is distributed in negative proposition but undistributed in affirmative ones. This can be diagrammatically described as follows:

‘A’ Proposition

“All Indians are religious-minded”

P - religious minded

S - Indians

\[ \text{S} \subseteq \text{P} \]

‘E’ Proposition

“No birds are mammals”

The classes are mutually exclusive

S-1 : Birds

S-2 : Mammals

\[ \text{S}_1 \cap \text{S}_2 = \emptyset \]

‘I’ Proposition

“Some birds are web-footed”

Two classes are partially included in one another

S-1: Birds

S-2: Webfooted

\[ \text{S}_1 \cap \text{S}_2 \neq \emptyset \]
‘O’ Proposition
"Some birds are not able to fly"

A - Some birds (Shaded area pin points some)
B - Birds that fly

The shaded part of circle (A) represents “Some birds”. The circle (B) refers to all those who are not able to fly. The subject "some" is undistributable but the circle represents substances that are unable to fly; it means it comes all. So in 'O' proposition, the predicate is distributed but not the subject.

Now, we shall study the logical relationships between two statements and their subsequent conclusions/inferences. The following section shall enable you to understand and answer the validity of relationships between (two statements and also the inferences they lead to.

Types of Logical Relationships
The relation between propositions which are logically relevant are those in which the possible truth or falsity of one or more propositions limits the possible truth or falsity of others. For instance:
(a) Art cannot be taught
(b) If art is knowledge, then art cannot be taught.
(c) If art is knowledge, then it can be taught
(d) Art can be taught
(e) Art is knowledge
(f) Art is not knowledge
In (a) and (b) both cannot be true, since one affirms what the other denies and both cannot be false for the same reasons. Same relation applies between (e) and (f). Such propositions are contradictions. In (b) and (c) there is no contradiction because art can be taught under certain contingencies. There is no mutual limitation upon the possible truth/falsity of two propositions. They are called independent.

(a) and (f) asserted jointly form a conjunctive proposition and ask for the relation with (a). This is, if both (b) and (f) are true, (a) must be true.

Propositions so related that if the first is true, the second is also true, but if the second is true, the first is undetermined and not thereby limited in its truth value, are said to be in the relation of superaltern to subaltern, also called superimplication. The truth-value of a proposition in logic means either truth or falsity, for example:

If P is true, q is true
(hence, P symbolises any proposition and q any other)
If P is false, q is undetermined.
If p is true, q is undetermined.
If P is false, q is false

C – D = CONTRADICTORIES
Contradicities of two propositions both cannot be true, but one of them must be true. Contraries are extreme opposites; and do not between them exhaust all possibilities. They cannot both be true but they may both be false. Sub-contraries are precisely reverse of each other.

Logical inference questions

Now, after learning the basics of Logical reasoning, we proceed ahead with the type of questions we come across in competitive examinations.

These questions depend upon deducing the logical inference from the statements. Inference is a mental process of arriving at a conclusion from more than one proposition. Inferences are of two types. They are deductive. When we move from the general to the particular and inductive where the conclusion is wider in extent than the premises. In intelligence testing, mostly deductive inference ability is judged. Deductive inference may be further classified as

(1) Immediate inference; and
(2) Mediate inference

Immediate Inference

Here the conclusion is derived from a single-premise. It is a process of directly coming to a conclusion from one premise.

For example,

Statement: Some students are not bright,

Conclusion: Some bright persons are not students.

Statement: Industrial workers are paid well.

Conclusion: Some well paid persons are industrial workers.
(a) A correct statement is given and then it is asked whether the inference can be derived from that or not.

(b) An incorrect (false) statement is given and then it is asked whether the inferences are correct or not.

The results obtainable by immediate inference process are termed conversion; obversion; contraposition; and inversion.

**Conversion**

From a given proposition we infer another proposition by interchanging or transforming the subject and predicate thereby.

(a) Subject and predicate interchange their places.

(b) Quality does not change.

(c) Quantity (the denotation of the terms) also not change.

(d) The converse of A is I, of E is E, I is I but O cannot be converted. For example,

(1) All students are bright. (A)

   Therefore, some bright people are students. (I) — valid

(2) No man is virtuous. (E)

   Therefore, no virtuous being is a man. (E) — valid

(3) Some men are intelligent. (I)

   Therefore, some intelligent beings are men. (I) — valid

But proposition O cannot be converted as it will become an invalid inference, for example

(4) Some men are not wise. (O)

   Some who are wise are not men. (invalid)

**Obversion**

Conclusion is drawn by interchanging the quality without changing its meaning, thereby
(a) The subject of the given premise remains the subject in conclusion;
(b) The predicate of the conclusion will be contradictory to the given preposition by adding the word 'non';
(c) Quantity does not change.
(d) Quality changes; affirmative to negative, and vice-versa.

For example,
(1) All men are free. (A)
   Therefore, no man is not free. (E) — valid
(2) No man is perfect (E)
   Therefore, all men are non-perfect (A) — valid
(3) Some businessman are rich. (I)
   Therefore, some businessmen are not rich (O) — valid
(4) Some men are not good. (O)
   Therefore, some men are not good. (I) — valid. ... "...

**Contraposition**

Here a double change takes place. First the change is to obverse and then to converse. For example,
(i) All men are mortal. (A)
(ii) No non-mortal is a man. (E) Therefore, no man is non-mortal (E)

**Inversion**

There are two types of inversions.

*Partial* in which the subject is contradictory of the original and the predicate same as the original. The inverse of “All physicists are mathematicians” is either “Some non-physicists are non-mathematicians” or “Some non-mathematicians are non-physicists”. The former is partial and the latter is full inversion.

Only universal proposition A and E can be inverted. The inverse of A and E is always a particular proposition I or O.
Here are some examples of immediate Inferences

(1) **Statement**: Industrial workers are hard-working.
   **Conclusion**: Some hard-working persons are industrial workers.
   Conclusion is true because converse of A is I.

(2) **Statement**: Lady doctors are not less paid than the male doctors.
   **Conclusion**: Some male doctors are less paid than lady doctors.
   Conclusion is True because converse of E is E. hence valid

(3) **Statement**: No man is perfect.
   **Conclusion**: Some imperfect persons are man.
   Conclusion is True, contraposition of E, first obvert then convert.

(4) **Statement**: All men are mortal.
   **Conclusion**: No man is non-mortal.
   Valid because obverse of A is E.

(5) **Statement**: Some men are wise.
   **Conclusion**: Some men are not unwise.
   Conclusion is valid as obversion of I is O.

As a short cut to draw the conclusions from statements, we can also follow the following table which could be helpful in arriving at the right choices in most of the questions you'll come across in any logical reasoning test.

<table>
<thead>
<tr>
<th>If the first preposition (statement) is of type</th>
<th>If the second preposition (statement) of type</th>
<th>And the conclusion/inference is of type</th>
<th>The conclusion must be</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>Valid</td>
</tr>
<tr>
<td>A</td>
<td>E</td>
<td>E</td>
<td>Valid</td>
</tr>
</tbody>
</table>
Now, we should make use of these aids to answer the following type of questions.

**Immediate Inference Questions**

**Illustrations**

*Directions:* In each question below are given two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be absurd. Give your answer as

(A) Only 1 follows
(B) Only 2 follows
(C) Either 1 or 2 follows
(D) Neither 1 nor 2 follows
(E) Both I and 2 follows

1. Statements
   All horses are dogs.
   All dogs are mice.

Conclusion
1. All horses are mice
2. All mice are dogs

Answer: \( A + A = A \), therefore 1 follows, but for 2, this is not so.

2. Statements
   No coin is a dollar.
   Red token is a coin.

Conclusion
1. Red token is not a dollar.
2. Red token may not be a dollar.

Answer: If we change the order to align the propositions, it becomes \( A + E = E \), thus making 1 to follow but for 2, this is not so.

3. Statements
   All fathers are sons.
   No sons are educated.

Conclusion
1. All sons are educated.
2. No fathers are educated.

Answer: B For conclusion 2, \( A + E = E \), but not for 1.

4. Statements
   All cups are saucers.
No saucers is a kettle.

**Conclusion**

1. No cup is a kettle.
2. No kettle is a cup.

**Answer:** E Now A + E = E, therefore the conclusion should be “No cup is a kettle”, which is the same as “No kettle is a cup”. Thus both 1 and 2 follow.

5. **Statements**

   All books are magazines.
   
   Some magazines are novels.

**Conclusion**

1. Some books are novels.
2. Some novels are magazines.

**Answer:** B; A + I leads to no conclusion, thus from both these two statements, no conclusions follow, but if we consider only statement 2, we will find that this is the same proposition as conclusion 2. Thus only 2 follows.

**Practice Questions**

1. **Statements**

   Some books are magazines.
   
   Some magazines are novels.

**Conclusion**

1. Some books are novels.
2. Some novels are hooks.

2. **Statements**

   All beautiful girls are foolish.
   
   No foolish girls are smart.

**Conclusion**

1. No girl is smart.
2. No beautiful persons are smart.
3. Statements

Some cows are deer.
Some deer are fish.

Conclusion
1. Some cows are fish.
2. Some fish are cows.

4. Statements

Some shirts are socks.
No sock is red.

Conclusion
1. Some socks are skirts.
2. No shirt is red.

5. Statements

All bulbs are birds.
Some birds are butterflies.

Conclusion
1. All butterflies are bulbs.
2. Some bulbs are butterflies.

Answers and Explanations
1. I + I leads to no conclusions, this both conclusions are invalid.
2. The two statements leads to A + E = E
   Thus, conclusion should be
   “No beautiful girls are smart” but some of the conclusions are in this form.
3. I + I = no conclusion, thus both are invalid and neither (I) nor (2) follows;
4.  \( I + E = O \); which leads to the conclusion "Some shirts are not red". But if we consider only statement (1), then we will find that it is just another form of conclusion (I). Thus we can say that only (I) follows.

5.  \( A + I = \) No conclusion.

**Mediate Inference (Syllogism)**

Here two premises are given on the basis of which the inference has to be drawn.

For example:

(1)  All men are mortal.
     All teachers are men.
     Therefore, all teachers are mortals.

(2)  All men are good.
     Raveesh is a man.
     Therefore, Raveesh is good.

Syllogism may be further classified as follows:

a) **Categorical:** The given proposition or the premise is categorical. The conclusions are also categorical. For example:

   All men are strong
   He is a man.
   Therefore, he is strong.

b) **Hypothetical - Categorical:** The major premise is hypothetical (conditional assertion) and minor premise is categorical. Inference or conclusion remains categorical. For example:

   If you come in time, you will meet him.
   You came in time.
   Therefore, you met him.

c) **Disjunctive-Categorical:** The major premise is disjunctive (conditional proposition) and the minor premise is categorical. Inference also remains categorical. For example:
Either he is intelligent or you are teaching him.

He is intelligent.

You are teaching him.

d) **Dilemma:** The major premise is a compound hypothetical, the minor premise is disjunctive and the conclusion is either categorical or disjunctive. For example:

1. If A is B
   C is D.
   and E is F
       -
   C is D

2. Either A is B or E is F

3. C is D

e) **Fallacies (Syllogistic):** In a logical reasoning question, validity of the conclusion is to be determined. Fallacies are misleading arguments (sophism) and their validity, depends upon certain rules and their violation amounts to committing fallacy. There are various kinds of fallacies.

- **Undistributed middle:** Study the following example:

  All fruits are good for health.

  Iron tonic is good for health.

  Therefore, iron tonic is a fruit.

  The middle term "good or health" is undistributed and, therefore, the conclusion is fallacious.

- **Illicit process:** When the term undistributed in its own premise is distributed in the conclusion, an illicit fallacy occurs.

  Some intelligent persons are liars

  Raveesh is a liar.

  Therefore, Raveesh is intelligent.

- **Fallacy of two middle terms:** Study the following examples.
Nothing is better than wisdom.

A loaf of bread is better than nothing.

Therefore, a loaf of bread is better than wisdom.

In this example, there are four terms

"nothing", "better than nothing", "wisdom" and "a loaf of bread".

• Fallacy of diction; Here the use of ambiguous word in statements amounts to a fallacy. For example:

Apples are good.

Good is the aim of man's life.

Therefore the aim of man’s life is apples.

• Use of ambiguous phrases: also lead to fallacies, or when the construction of the sentence is misleading. These fallacies are called, 'fallacy of amphibology'. For example, Gavaskar, Kapil will lead.

In this, it is not clear as to who will lead — whether Gavaskar or Kapil.

• Fallacies of composition and division: An argument becomes erroneous in composition when what is true of certain things, each taken separately, is assumed to be true of them collectively in the conclusion. For example,

Three and two are odd and even.

Three and two are five.

Therefore, five is odd and even.

An argument becomes erroneous in division when what is true of certain things collectively is taken to be true of them separately in the conclusion. For example,

Red Indians are disappearing.

He is a Red Indian.

Hence, he is disappearing.

In addition, there are fallacies relating to wrong accent, false causes and arguing beside the point which can be easily made out from the given statement.
Illustrations

Directions: In each of the following questions, two statements are given followed by two conclusions numbered 1 and 2. You are to take the two statements to be true even if they seem to be at variance from commonly known facts and then decide which one of the conclusions logically follows from the two statements. Your answer will be:

(A) if only conclusion 1 follows
(B) if only conclusion 2 follows
(C) if either 1 or 2 follows
(D) if neither 1 or 2 follows
(E) if both 1 and 2 follows

1. Statement
Smoking is dangerous. Rash driving is dangerous.

Conclusions
1. Rash driving is smoking.
2. Smoking is rash driving.

Answer: D

2. Statement
Some cooks are young. All boys are young.

Conclusions
1. Some boys are cooks.
2. Some cooks are boys.

Answer: D

3. Statement
Stories are interesting. All interesting incidents are rumors.

Conclusions
1. Stories are rumors.
2. Rumors are stories.
4. Statement
All girls are beautiful. Vandana is a girl.

Conclusions
1. Vandana is beautiful.
2. Vandana is not beautiful

Answer: A

5. Statement
Some dogs bite. All dogs bark.

Conclusion
1. Dogs which bite also bark.
2. Dogs which bark do not necessarily bite.

Answer: A

6. Statement
Doctors serve their country.

Engineers are not doctors.

Conclusions
1. Engineers do not serve their country.
2. Sonic engineers serve their country.

Answer: A

7. Statement
All travellers are men. All men are graduates.

Conclusions
1. All men are travellers.
2. All travellers are graduates.

Answer: B

8. Statement
Dogs have four legs. Tables have four legs.
Conclusions
1. Tables are dogs.
2. Dogs are tables.
Answer: D

9. Statement
Rats are Bats. Bats are Mats

Conclusions
1. Mats are Rats.
2. Rats are Mats.
Answer: D

10. Statement
Some men are wolves. All wolves are hungry.

Conclusions
1. Men are hungry wolves.
2. All those who are hungry are wolves.
Answer: D

11. Statement
Rats are bats, rats eat mats.

Conclusions
1. Bats eat mats.
2 Mats eat bats
Answer: D

12. Statement
Love is God
Faith is God

Conclusions
1. Love is Faith.
2. Faith is Love.
Answer: D
13. **Statement**
All radios are transistors. Some transistors are imported.

**Conclusions**
1. All radios are imported.
2. All transistors are not radios.

**Answer:** B

**Practice Questions**

1. **Statement**
Whales are fish. Fish are in the sea.

**Conclusions**
1. Whales are in the sea.
2. Whales are sea.

2. **Statement**
The committee rewarded him. Kuldeep Jain is the member of a committee.

**Conclusions**
2. Kuldeep Jain did not reward him.

3. **Statement**
Industrial cities are highly polluted.
Pollution means more diseases.

**Conclusions**
1. People who live in industrial cities become immune to diseases.
2. People living in cities which are not industrial are healthier than those who live in industrial cities.

4. **Statement**
Space has no gravitational pull.
It has no atmosphere.

**Conclusions**
1. Gravity is due to atmospheric pressure.
2. Its not difficult, to breathe in space.

5. Statement
People live in wooden houses in Simla
Earthquakes are frequent in Simla.

Conclusions
1. Wooden houses are tremor proof.
2. Wooden houses are stronger than brick house.

6. Statement
Computer literates have good reasoning ability.
Seema can understand the puzzle quickly.

Conclusions
1. Seema is computer literate.
2. Seema has good reasoning ability.

7. Statement
Some stones are diamonds.
All diamonds are glasses.

Conclusions
1. All glasses are stones.
2. All stones are glasses.

8. Statement
Evaporation causes cooling.
Coke is very cold.

Conclusions
1. Some of the coke must have evaporated.
2. Coke offered in this restaurant is very cold.

9. Statement
All my daughters are beautiful.
Komal is very beautiful.

Conclusions
1. Komal is my daughter.
2. Komal may not be my daughter.

10. Statement
My brothers sings very well. My sister is a basket-ball player. I am very intelligent.

Conclusions
1. We all are very talented.
2. We all are sportsmen.

11. Statement
Nana is brother of Lolo.
Tata is brother of Nana.

Conclusions
1. Lolo is a boy.
2. Lolo is a girl.

12. Statement
Some eggs are potatoes.
All potatoes are tomatoes.

Conclusions
1. All eggs are tomatoes.
2. All tomatoes are eggs.

13. Statement
Sheetal is a friend of Mukta.
Mukta is a friend of Vandana.

Conclusions
1. Sheetal, Mukta and Vandana are friends.
2. Sheetal is friend of Vandana.
ASSUMPTION/CONCLUSION OR STATEMENT/ARGUMENT TYPE QUESTIONS

(A) Commonsense Reasoning Vs Logical Reasoning

In common sense reasoning, no doubt logical rules and our personal judgments are helpful but are cannot arrive at a 100% correct answer. In the reasoning questions, if we use commonsense and judgment only (instead of logical reasoning tools), we may come across wrong answers which seem to be true sense wise but are not actually.

In such questions the answer choice is more than two, i.e. (a) True (b) Probably true and (c) Probably false or Irrelevant. Here first you have to ascertain whether the conclusion is wholly true or totally false. If the probability is nearly 100% or even if it is more than 50%, the argument is probably true, for the simple reason that it is nearer to 100% than to zero. If it is less than 50%, then it is probably false because in that case it is nearer to zero.

If it is zero, then it is absolutely false and if it is 100% true, its absolutely true. For instance,

*Statement:* All students of this class secured 1st division. Shrenik is a student of this class.

*Conclusion:* Shrenik secured first division.

(Conclusion is TRUE: 'All' includes Shrenik and thus is 100% TRUE.)

However, in logical reasoning you have to base the validity or falsity of the conclusion on the given premises. You are not concerned with the truth or falsity of the given premises. You have to presume they arc correct, which in fact they may not be. For example,

*Statements:* Some men are cars.
Manoj is a man.

Conclusion (I): Some cars are men.

Conclusion (II): Some men are not cars.

From the above statements, we conclude that some men are cars because some cars are men and some men may not be cars. Actually, no man can be a car and no car can be a man. However, from logical deduction this can be concluded though actually it is wrong.

(B) Rational Arguments

The properties of relation involved in a piece of argument also govern the validity of the conclusion. These relations are classified as follows:

Symmetrical: Where if the premise is correct, the conclusion is also correct.

Asymmetrical: Where if the premise is right, the conclusion is false.

Non-symmetrical: Where if the premise is true, the conclusion may or may not be true.

Transitive: Where relation travels from A to C via B or X to Z via Y.

Intransitive: Where relations do not travel as in transitive argument.

Reflexive: When the relation holds between a term and itself.

Irreflexive: When it cannot hold between a term and itself.

Non-reflexive: These may or may not hold between a term and itself.

The following examples are illustrative of relational arguments.

1. A is equal to B.

   Therefore, B is equal to A.

   (Symmetrical — hence valid).

2. A is greater than B.

   Therefore B is greater than A.

   (Asymmetrical — hence invalid).

3. A is brother of B.

   Therefore, B is brother of A.
(Non symmetrical not or may not be hence, may or may not be valid).

4. A is equal to B  
   B is equal to Z.  
   Therefore, A is equal to Z.  
   (Transitive — hence valid).

5. A is father of B.  
   B is father of C.  
   Therefore, A is father of C.  
   (Intransitive — hence invalid).

6. A is good to B.  
   B is good to C.  
   Therefore, A is good to C.  
   (Non-transitive-hence invalid — may or may not be good).

7. Kuldeep is as tall as Rohit.  
   Rohit is as tall as Lokesh.  
   Therefore, Kuldeep is as tall as Lokesh.  
   (Valid — possess reflexiveness, symmetrical and transitivity).

**Illustrations**

*Directions*: in each of the following questions, a conclusion is made out of two assumptions. Your task is to consider each assumption first and decide about the conclusion offered, whether the conclusion is

(A) True  (B) False  (C) Irrelevant  (D) Probably False  (E) Uncertain

Assumptions may be absurd, but the conclusion is very much related to the assumptions.

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (i) LPG is a gas.</td>
<td>So this cylinder contains LPG</td>
</tr>
<tr>
<td>(ii) This cylinder contains gas.</td>
<td></td>
</tr>
</tbody>
</table>
Answer: E, The gas in the said cylinder may or may not be LPG. Therefore, uncertain.

2. (i) Aeroplanes have no wings. Therefore, aeroplanes are animals.
   (ii) Animals have no wings.

   Answer: B, It is false as a categorical interference is not possible from two relational propositions.

3. (i) No number over 30 can participate in the summit.
   (ii) Gopal participated.

   Answer: A, The first proposition is categorical and the other one is violational.
   (No rule is violated)

4. (i) Some children are old. So, some young are children.
   (ii) All old are young.

   Answer: A, Same as Ans. 3.

Practice Questions

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (i) I know a police officer,</td>
<td>So, all police officers drink too much</td>
</tr>
<tr>
<td>(ii) He drinks too much.</td>
<td></td>
</tr>
<tr>
<td>2. (i) All red wines are in red</td>
<td>So, drinking from red bottle is good for health.</td>
</tr>
<tr>
<td>bottles</td>
<td></td>
</tr>
<tr>
<td>(ii) Red wine is good for health</td>
<td></td>
</tr>
<tr>
<td>3. (i) All cars are buses.</td>
<td>Therefore, all cars are Jeeps,</td>
</tr>
<tr>
<td>(ii) All buses are jeeps</td>
<td></td>
</tr>
<tr>
<td>4. (i) Every peon is a manager.</td>
<td>So, every peon is a clerk,</td>
</tr>
<tr>
<td>(ii) Every manager is a clerk.</td>
<td></td>
</tr>
</tbody>
</table>

Answers and Explanations
1. Both the assumptions are relational proposition and one characteristic cannot be applied to all.
2. A red bottle may or may not contain red wine.
3. Relational argument, so one contains the other.
4. Same as Ans. 3.

**ANALYSIS OF STATEMENTS**

In such questions, a problem is posed in an interrogative sentence followed by two arguments, one of which begins with YES, and other with NO. To arrive at a correct answer, the following points are to be borne in mind.

(a) The arguments should be factual, i.e. based on facts and not on assumption.
(b) The arguments should be specific and not generalized.
(c) The argument should be in conformity with the prevailing ideas and truth and should support the current thinking of the majority.
(d) There should not be any kind of ambiguity in the arguments.

The questions below, an example of question format, is followed by two arguments I and II. You have to decide which of the two arguments is strong and which is weak and mark the answer choice based on the following:

(a) Only I is strong
(b) Only II is strong.
(c) Both I and II are strong.
(d) Either I or II is strong.
(e) Neither I nor II is strong.

**Statement:** Computerisation in offices is a must to provide efficient services to the citizens.

**Arguments:**
(I) Yes, because the work is done quickly and time is not wasted.
(II) No, it will generate more unemployment.

**Solution:**
(a) The argument (I) is quite strong to support computerization in offices.
Illustrations

Directions: In each of the following questions, a statement is followed by two arguments numbered 'X' and 'Y'. Your task is to consider each statement and the arguments that follow and decide which of the argument is forceful and to what degree. You are to pick up one of the following to indicate your answer.

(A) Argument ‘X’ is forceful.
(B) Argument ‘Y’ is forceful.
(C) Neither ‘X’ nor ‘Y’ is forceful.
(D) Both ‘X’ and ‘Y’ are forceful
(E) Both ‘X’ and ‘Y’ are irrelevant.

1. Statement: Should our country leave democracy?
   Arguments
   X. Yes, as elections are giving hung parliament every time.
   Y. No, dictatorship will be even worse.
   Answer: C

2. Statement: Should India take the services of an European coach for its national hockey team?
   Arguments
   X. Yes, because Asian hockey is dying.
   Y. No, because Europeans will learn about Indian hockey skills by doing So.
   Answer: C

3. Statement: Should India go for only two major political parties?
   Arguments
   X. Yes, because so many parties are leading to a hung parliament at the centre.
   Y. No, because fewer parties will limit the choice of the voters
   Answer: A
4. **Statement:** Should liquor be banned throughout the country?

   **Arguments**
   X. Yes, as it will minimise road accidents.
   Y. No, it will effect revenue collection in the country.

   **Answer:** B

5. **Statement:** Should trade unions be banned?

   **Arguments**
   X. Yes, as they create a lot of problem for industrialists.
   Y. No, as they take care of the rights of the labour working in the industries.

   **Answer:** B

**Practice Questions**

1. **Statement:** Should national highways in India be given to private companies, for maintenance?

   **Arguments**
   X. Yes, because they will maintain it better than government agencies.
   Y. No, because they are meant for public.

2. **Statement:** Should the education system of India be changed?

   **Arguments**
   X. Yes, because sphere of knowledge around the globe is increasing.
   Y. No, because it is a time-tested system.

3. **Statement:** Should India and Pakistan unite?

   **Arguments**
   X. Yes, because East & West Germany has also united.
   Y. No, because USSR could keep itself together.

4. **Statement:** Should professional education in India be made free of cost.

   **Arguments**
X. Yes, as this will make all our citizens professionals.
Y. No, as the competition will become even more light.

5. **Statement:** Should military training be made compulsory to Indian youth?

**Arguments**

X. Yes, as it will discipline the Indian youths.
Y. No, as the youth can move its way to military.

**Answers:**

1. A  
2. A  
3. E  
4. E  
5. A

**REASONING LOGICAL DIAGRAMS**

In such questions, candidates are expected to establish a relationship among three or more items represented by diagrams. This requires a logical understanding and careful observation of the diagrams.

The items represented by the diagrams may be individuals, groups, class/category of individuals, cities-districts-state relationship or some other phenomenon. Generally two types of logical reasoning tests are used.

Here is another question based on class relationships. You will find this type of question in several competitive examinations.

**EXAMPLE**

The triangle, square and circle shown below respectively represent urban, hardworking and educated people. Which one of the areas marked I-VII represents the urban educated who are not hardworking?
(a) II   (b) I   (c) IV   (d) III

ANSWER:  (C)

Explanation

Urban = △
Hardworking = □
Educated = ○

Therefore, urban, educated and not hardworking should be the common region of triangle, and circle, which is numbered (iv) in the above diagram.

I. Single Diagrammatic Relationship

Here a diagram is given of which a few parts are numbered. The candidate is asked to point out which number represents a particular statement.

Illustrations

Directions: The diagram shown below represents 3 segments of society overlapping each other viz.

Circle - Educated youth
Triangle - Unemployed youth
Square - Employed youth

Based on the above relationships given in the diagram you have to point out which number represents the following statements.

1. Some educated youths are employed.

   (1) (2) (3) (4) (5) (6) (7)

   **Answer:**

2. Some youths are neither educated nor employed.

   (1) (2) (3) (4) (5) (6) (7)

   **Answer:** (6) The number 6 is only in the triangle which represents unemployed youth.

3. Some educated youths are not employed

   (1) (2) (3) (4) (5) (6) (7)

   **Answer:**

4. Some employed youths are not educated

   (1) (2) (3) (4) (5) (6) (7)

   **Answer:**

**Directions (5-14):** The diagram shown below represents four types of literates. Which knows English, Hindi, Punjabi and Urdu. If we are given values for A, B, C, D such as A = 40; B = 2A; C = A/2 and D = 2E. Based on above information try to solve question which follow:
5. People who can read and write Hindi, Urdu and Punjabi are represented by
   (A) A   (B) D   (C) K   (D) E   (E) F
   **Answer:** C

6. People who can read and write all the languages are represented by
   (A) L   (B) J   (C) M   (D) K   (E) I
   **Answer:** C

7. People who can read and write all the languages except Urdu are represented by
   (A) K   (B) M   (C) B   (D) I   (E) D
   **Answer:** D

8. People who can read and write English, Hindi and Punjabi are represented by?
   (A) L   (B) K   (C) C   (D) E   (E) F
   **Answer:** D

9. People who cannot read and write Urdu and Punjabi, but are conversant with English and Hindi both are represented by
   (A) M   (B) B   (C) J   (D) K   (E) I
   **Answer:** B

10. People who do not know English and Hindi but are familiar with Urdu and Punjabi, both are represented by
    (A) F   (B) G   (C) E   (D) K   (E) M
    **Answer:** A

11. Which language is known by maximum number of people as per above diagram?
    (A) Punjabi   (B) English   (C) Hindi   (D) Urdu
        (E) Can't be determined
    **Answer:** C
12. How many people know only Urdu?
   (A) 40 (B) 10 (C) 20 (D) 60 (E) 50
   Answer: C

13. How many people know Urdu or Punjabi?
   (A) 40 (B) 20 (C) 80 (D) 60 (E) 65
   Answer: D

14. How many people can read and write only one language except Punjabi?
   (A) 120 (B) 140 (C) 100 (D) 160 (E) 180
   Answer: B

Practice Questions

Directions: (Ques. 1 to 6) Following questions are based on the diagram given below where each square represents a class/group of people:

1. College students who are artists but not dancers are represented by
   (A) A (B) B (C) C (D) D (E) F

2. Artists who are neither dancers nor college students are represented by
   (A) A (B) B (C) C (D) F (E) E

3. College students who are dancers but not artists are represented by
   (A) B (B) C (C) F (D) E (E) D

4. College students who are artists as well as dancers are
   (A) B (B) C (C) D (D) E (E) A

5. College students who are dancers and artists both are represented by
6. College students who are neither dancers nor artists are represented by
   (A) B   (B) A   (C) D   (D) C   (E) E

Questions (7-10): Refer to the following diagram

7. The number of students who took any three of the four subjects
   (A) 64   (B) 62   (C) 61   (D) 64   (E) 66

8. The number of students in total who took History or Mathematics or Science was
   (A) 183   (B) 480   (C) 262   (D) 340   (E) 195

9. The number of students who took both History and Geography among other subjects was
   (A) 60   (B) 65   (C) 66   (D) 62   (E) 63

10. Which subject was taken by the largest number of students?
    (A) Science   (B) History   (C) Geography   (D) Mathematics
        (E) Cannot be determined

Questions (11-14): Refer to the following diagram:

□ Government employee
△ Urban people
○ Graduate
□ Teacher
11. Which of the following statements is true?
(A) All Urban peoples are graduates.
(B) All graduates are urban.
(C) All Urban Government employees are graduates.
(D) All teachers are urban people.

12. Choose the correct statement.
(A) There are some Urban teachers who are government employees as well as graduate.
(B) No teacher is a government employee.
(C) All graduates are government employees.
(D) All government employees are urban people.

13. Mark the correct statement.
(A) All non-urban teachers are government employees.
(B) All urban government employees are teachers.
(C) There are some non-urban graduates who are neither teachers nor government employees.
(D) All urban government employees are graduates.

14. Which of the following statement is not true?
(A) Some government employees are rural.
(B) All teachers are urban.
(C) Teachers who are government employees are urban.
(D) All government employees are urban people.

**Answers**

II. Multi-diagrammatic Relationship

In such questions, there are several diagrams (Triangles/squares/circles, etc.) which represent different relationships. The candidate has to pin point a portion in the diagram that represents the particular statement.

Logical diagrams

Another type of reasoning question asked in competitive examinations is based on logical diagrams. In these logical diagrams, also called Venn diagrams, various items and their relationships are represented by circles or other types of diagrams. In these questions you will be presented three different classes or groups of familiar objects and will be asked to identify their mutual relationships. For example:

Illustrations

Directions: Which of the following diagrams best depicts the relationship between various items/objects given in question 1 to 5?

1. Animal, cow, elephant
2. Father, brother, mankind
3. Snake, snake-charmer, basket
4. Doctor, female, mother
5. Musician, instrumentalist, violinist
Answers and Explanations

1. (a) Cows and elephants are two separate classes and both come under a broader class of animals.

   ![Diagram of animals]

2. (c) A father may or may not be a brother also. This can be represented by two intersecting circles. However, they are both covered under the broader class of mankind.

   ![Diagram of father and brother]

3. (b) Snake, snake-charmer and basket are three district items and as such can be represented by three separate circles.

   ![Diagram of snake, snake-charmer, and basket]

4. (d) All mothers are females but all females are not mothers. Therefore, they are represented by intersecting circles. As doctors can be male or female, this class is represented by another circle intersecting both the intersected circles.

   ![Diagram of female, mother, and doctor]

5. (e) Violinists come under the class of instrumentalists and also come under wider class of musicians as shown below:
How to tackle such questions?

To tackle such questions note the step-wise explanations of each type of relationship which is possible. There are three possible relationships between any two different classes or objects. One may contain the other, the two may intersect, or the two may be totally separate. These relationships can be graphically represented by the following examples:

- **Animals, cows**
  
  Means that one class (animals) contains all the members of the other (cows).

- **Professors, doctors**
  
  Means that each class has some members that are members of the other class and some members that are not members of the other class.

- **Animals, men**
  
  Means that the two classes have no members in common. In other words, they are separate classes.

Once you have determined the relationship between two classes, adding a third class means that you have to determine two more relationships. If the three classes are called (X), (Y) and (Z), the three relationships are (X) to (Y), (X) to (Z) and (Y) to (Z). For example:

1. **Animals, Men, Trees**

   ![Diagram](image)

   This shows three separate classes.
2. Oceans, Pacific Ocean, Water Bodies.

This shows three classes. Each class either contains another class, or is contained within another class. In the above example, the inner circle represents Pacific Ocean which belongs to the class of oceans, the second largest circle. The outer circle shows all water bodies. The outermost class encompasses oceans, since all oceans are water bodies but some water bodies may not be oceans.

3. Parrots, males, mammals

Parrots and Mammals are separate classes and are represented by the left and right circles respectively. The class of males in the middle, intersects each class. Some males are mammals and some mammals are not male. Some males are parrots and some parrots are not male.

4. Athletes, Stars, Men

Each class intersects every other class. It means there are some members belonging to all the three classes, and each of the three classes has some members that belong to neither of the other two classes.

5. Human beings, mothers, robots
Since the mothers belong to the class of human beings and some human beings are not mothers, the circle representing human beings contains the circle representing mothers. Since no robots are human beings, the circle representing robots is separate from that representing human beings.

6. Father, brother, sister

Since father and brother are males and sisters are females, sisters are represented by the circle separate from the other two. Since some, but not all, fathers are brothers and some brothers are not fathers, this is represented by intersecting circles.

7. People, painters, boys

All painters and boys belong within the class of people — the outermost circle. Since some, but not all, painters are boys and some boys are not painters, this is represented by intersecting circles.

8. Boys, girls, children

All boys and girls are children, but no boys are girls. The three classes are thus represented by two separate circles contained within a larger circle representing children.

9. Females, mothers, teachers
This relationship involves three comparisons. One class contains another, and both of them intersect the third class.

In this case, all *mothers* are *females*, some but not all mothers are *teachers*, and some females are not teachers. The three comparisons can be understood as follows:

(a) All *mothers* are *females*

(b) *Mothers* and *teachers* form an intersecting set, since some, but not all, mothers are teachers and some, but not all, teachers are mothers.

(c) *Females* and *teachers* also form intersecting sets, since some, but not all females are teachers and some, but not all, teachers are females, and all mothers are females.

10. Radio artists, TV artists, Theatre artists
The classes of TV artists and radio artists intersect. Some people give performances on both TV and radio, and some artists give performance only in TV programmes or only in radio programmes. The class of people who are artists of TV, radio and theatre must be a subset of the set consisting of artists of both TV and radio.

Illustrations

Directions: Based on the above diagrams, one has to find out which of the diagrams represents the relationship given in the following statements.

1. Ludhiana, Punjab, North-India

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

Answer: C Ludhiana is in Punjab and Punjab is in India, i.e. Ludhiana = Smaller circle, contained in little larger circle = Punjab, which is contained in a bigger circle – India

2. Criminals, Police, Force
3. Educated people, Employed people

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

Answer: B Some educated people are employed and some are unemployed also.

4. Mammals, Men, Crow

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

Answer: E Man is a mammal and as such represented by the diagram E-I and the crow is a bird (non-mammal), a separate category in the animal kingdom and as such represented by a separate circle.

5. Rural population, Agricultural Labourers, Businessmen

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

Answer: A Agricultural labourers come within the rural population and some individuals of these classes may also be businessmen.

Questions (6-15): Refer the diagram given below:
6. Animals, Cows, Dogs  
   Answer: E

7. Cousins, Males, Nephews  
   Answer: B

8. Women, Story teller, Liars  
   Answer: C

9. Doctors, Surgeons, Musicians  
   Answer: D

10. Students, Females, IAS aspirants  
    Answer: C

11. Bedroom, Sitting room. Dwellings  
    Answer: E

12. Civil Engineer, Boiler Engineer, Engineers  
    Answer: E

13. People, Doctors, Cows  
    Answer: D

14. Typewriters, Reading materials, Magazines  
    Answer: D

15. Policemen. Magistrates, Human beings  
    Answer: E

**Tips to Solve such Questions**

To solve such questions, the following relationship between various diagrams should be borne in mind:

1. A and B here represents 2 different items of population having no relationship with each other.

   ![Diagram](image)

2. Represents that one class/category is contained in the other.

   ![Diagram](image)
3. Represents that neither class/category is contained fully in each other but have some numbers in common.

4. Represents that there are 3 groups/categories/segments. None of them is fully contained within the other but they have members in common.

5. Represents that two groups are completely contained in a bigger class of the population.

This relationship can be further extended to include several other relationships as well.

MULTI-DIAGRAMMATIC RELATIONSHIPS

Direction: Following questions are based on the following diagrams, marked A-F. Each diagram represents various types of relationships. Select the diagram that best represents the relationship between various classes of people/items mentioned in the following questions.
1. Hospital staff, Nurses, Doctors
2. Doctors, Surgeons, Physiotherapists
3. Bidi-smokers, Smokers, Cancer patients
4. Christians, Catholics, Church goers
5. Christians, Catholics, Pope
6. Educated people, Professors, Rich peoples
7. Illiterate people, Poor people, Unemployed
8. Alleged terrorists, Prisoners, Terrorists
10. Doctors, Surgeons, Married people

Questions (11-20):
11. Male, Father, Book
12. Family, Spouse, Husbands
13. Doctors, Human beings, Cows
14. Social workers, Alcoholics, Tetotallers
15. Females, Mothers, Nurses
16. Dogs, Rabbits, Rats
17. Females, Mothers, Sisters
18. Beef, Mutton, Eggs
19. Students, Married people, Human beings
20. Husbands, Brothers, Males

**Question (21-25):**

21. Footballs, Spheres, Shuttle cocks
22. Jewels, Diamonds, Carats
23. Typesetters, Writers, Typewriters
24. Tomatoes, Lettuce, Crops grown in Himachal Pradesh
25. Swimming pools, Oceans, Beaches

**Answers:**

LOGICAL DEDUCTIONS

Here we use logical diagrams to deduce the logic in the given statements and find the conclusions.

Illustrations

1. **Directions:** Read the following statement and draw the correct conclusion:

   If all books are tables and no table is a chair, then definitely no chair is a book.

   (a) True  (b) False  (c) Neither  (d) Cannot be inferred

   **Answer:** (a) We can solve this question in one of two methods as shown below.

   (i) Take another example. If all dogs are animals and no animals are plants, then no plants are definitely dogs.

   (ii) Draw Venn's diagram.

   It is therefore **true** that no chair is definitely a book.

   ![Venn Diagram]

   **Q. 2 to 7: Directions:** In each of the following questions, there are two statements (A) and (B) followed by four conclusions numbered I, II, III and IV. Though the statements are at variance from commonly known facts, you have to assume them to be true. Read the conclusions and, based on the information given in statements (A) and (B), decide which of the opinions follow from A and B.

2. **Statements:** (A) All books are trees.  (B) All trees are lions

   **Conclusions**

   I. All books are lions.

   II. All lions are books.
III. All trees are books.
IV. Some lions are books.
(a) Only II and III follow.
(b) Only I and IV follow.
(c) None of the conclusions follow.
(b) All conclusions follow.

**Answer:** (a) From Statement (A) (all books are trees) and statement (B) (All trees are lions), it is clear that all books are lions (conclusion I), but not that all lions are books or all trees are books (conclusion II and III). However, some lions can be books (conclusion IV). Hence, conclusions II and III are not applicable and only I and IV can be inferred. The Venn diagram will make the situation clear.

3. **Statements:**
   A. No cow is a chair.
   B. All chairs are tables.

**Conclusions**
I. Some-tables are chairs.
II. Some tables are cows.
III. Some chairs are cows.
IV. No table is a cow.
(a) Either II or III follow
(b) Either II or IV follow
(c) Only I follows
(d) All conclusions follow

**Answer:** (c) It is clear that a cow can never be a chair or a table. Since all chairs are tables, it is evident that some tables are chairs (conclusion I). Conclusions II, III and IV are not applicable. See the following diagram.
4. **Statements:**
   
   A. All pens are pencils.
   
   B. No pencil is a monkey.

**Conclusions**

I. No pen is a monkey.

II. Some pens are monkeys.

III. All monkeys are pens.

IV. Some monkeys are pens.

(a) Only I and III follow.

(b) Either II or III follow.

(c) None of the conclusions follow.

(d) Only I follows.

**Answer:** (d) From the given statements, it is clear that a monkey is a separate class and has no relationship with pens or pencils. Therefore, only conclusion I can be inferred and conclusions II, III and IV are not applicable. See the following diagram:

5. **Statements:**

   A. All buses are trees.

   B. All trees are windows.

**Conclusions**

I. All buses are windows.

II. All windows are buses.

III. All trees are buses.
IV. Some windows are buses.
(a) Only I and II follow.
(b) None of the conclusions follow.
(c) Only II and III follow.
(d) Only I and IV follow.

**Answer:** (c) When all buses are trees and all trees are windows (statements A and B), it implies that all buses are windows (conclusion I), but all windows cannot be trees and all trees cannot be buses. However, some windows can be buses (conclusion IV). Study the following Venn diagram, which will make the situation clear.

```
  Trees
  |   |
  |   Buses
  |   |
  |   Windows
```

**Practice Questions**

1. **Statements:**
   A. All goats are tigers.
   B. All tigers are lions.

   **Conclusions**
   I. All tigers are goats.
   II. All lions are tigers.
   III. No goat is a lion.
   IV. No lion is a goat.
   (a) Only III and IV follow
   (b) Only I and II follow
   (c) None of the conclusions follow
   (d) All conclusions follow.
2. **Statements:**
A. Some skirts are benches.
B. No bench is a table.

**Conclusions**
I. Some skirts are tables.
II. Some benches are skirts.
III. All benches are skirts.
IV. Some tables are skirts.
(a) Only I follows
(b) Only II follows
(c) Only II and IV follow
(d) None of the conclusions follow.

3. **Statements.**
(A) All chairs are tables.
(B) Some tables are sofasets.

**Conclusions**
I. Some sofasets are chairs.
II. All sofasets are chairs.
III. Some chairs are sofasets.
IV. All chairs are sofasets.
(a) All conclusions follow
(b) Only I and II follow
(c) None of the conclusions follow
(d) Only II and III follow

4. **Statements:**
(A) No book is a pencil.
(B) All pencils are erasers.
Conclusions
I. No pencil is a book.
II. Some erasers are books.
III. No eraser is a book.
IV. No pencil is a book.
(a) Only I and IV follow.
(b) None of the conclusions follow.
(c) Only I, II and IV follow.
(d) All the conclusions follow.

5. Statements:
   (A) All men are women.
   (B) All women are crazy.

   Conclusions
I. All men are crazy.
II. All the crazy are men.
III. Some of the crazy are men.
IV. Some of the crazy are women,
(a) None of the conclusions follow
(b) All the conclusions follow
(c) Only I, III & IV follow
(d) Only II and III follow

6. Statements:
   (A) Some donkeys are elephants.
   (B) Some elephants are cats.

   Conclusions
I. Some cats are donkeys.
II. Some donkeys are cats.
III. Some elephants are donkeys.
IV. Some cats are elephants
(a) None of the conclusions follow
(b) Only II and III follow
(c) All the conclusions follow
(d) Only I, III and IV follow

**Answers and Explanations**

1. (c) From statement (A) and (B), all goats are tigers and all tigers are lions. This implies that all goats are lions. Hence no conclusion follows. Study the following Venn diagram.

   ![Venn Diagram for Goats and Tigers]

2. (b) From statement (A), some skirts are benches, therefore some benches are skirts. Tables have no relationship with either of these. Hence only conclusion II follows. Study the following diagram.

   ![Venn Diagram for Skirts and Benches]

3. (b) OR
Both I and II follows. Since the given choices have different conclusions, the answer will be (b). None of the conclusions follow.

4. (c)

5. (c)

6. (c)

FAMILY/BLOOD RELATION QUALMS

One of the many kinds of questions generally asked in logical reasoning tests is the FAMILY/BLOOD RELATION questions. These questions start with a series of related statements, usually about 5 to 7 with one statement directly under the other. Following the series of statements, several multiple-choice questions are given. Careful analysis of each of the statements, singly and collectively, is required in order to arrive at the correct choices.

In most of such questions, it is very useful to draw a diagram relating to what is mentioned in the passage or in the set of statements. Another way to improve ability to answer Family/Blood relation questions is to compose your own questions about your own or any other family known to you. Accordingly, test the validity of your own questions by trying them on some of your friends.

On the following pages, you will find several practice situation/questions
for this type. Answering these questions and going over the Explanatory answers for each of the test questions will help you greatly to sharpen your ability to answer the questions in the competitive examinations.

**Illustrations**

**Directions:** The questions (1-8) are based on the following statements.

(a) Seeta, Rajinder and Surinder are children of Mr. and Mrs. Maudgil.
(b) Renu, Raja and Sunil are children of Mr. and Mrs. Bhaskar.
(c) Sunil and Seeta are married and Ashok and Sanjay are their children.
(d) Geeta and Rakesh are children of Mr. and Mrs. Jain.
(e) Geeta is married to Surinder and has three children named Rita, Sonu and Raju.

Questions 1-8 can be understood with the help of the following diagram.

1. How is Rajinder related to Raju?
   - (A) Brother
   - (B) Uncle
   - (C) Brother-in-law
   - (D) Cousin
   - (D) Maternal Uncle
   **Answer:** B

2. How is Rajinder related to Ashok?
   - (A) Brother-in-law
   - (B) Father-in-law
   - (C) Cousin
   - (D) Uncle
   - (C) Maternal Uncle
   **Answer:** C

3. How is Rakesh related to Surinder?
(A) Brother     (B) Cousin    (C) Uncle
(D) Maternal Uncle  (E) Brother-in-law

Answer: E

4. How is Raksh related to Rita?
   (A) Brother     (B) Cousin    (C) Uncle
   (D) Maternal uncle  (E) Brother-in-law

Answer: A

5. What is Sanjay’s Surname?
   (A) Bhaskar     (B) Jain     (C) Maudgil
   (D) Surinder    (E) None of the above

Answer: D

6. Renu is Sanjay’s
   (A) Sister     (B) Sister-in-law    (C) Cousin
   (D) Niece      (E) Aunt

Answer: E

7. Raju’s Surname is
   (A) Jain       (B) Bhaskar     (C) Maudgil
   (D) Surinder   (E) None of the above

Answer: A

8. Sunil and Rakesh are related as
   (A) Brothers    (B) Cousins    (C) Uncle and Cousin
   (D) Brother-in-law (E) None of the above

Answer: D

Practice Questions

Directions: The questions (1-4) pertain to the following information.

Amit is the son of Rahul. Sarika, Rahul’s sister has a son, sonu and a daughter, Rita. Raja is the maternal uncle of sonu.

1. How is Amit related to Sonu?
LOGICAL REASONING

1. How are Raja and Rahul related?
   (A) Nephew  (B) Cousin (Brother)  (C) Uncle
   (D) Brother  (E) None of these

2. How is Rita related to Raja?
   (A) Sister  (B) Daughter  (C) Niece
   (D) Aunt  (E) None of these

3. How many nephews does Raja have?
   (A) 1  (B) 2  (C) 3  (D) 4  (E) None

4. What is the relationship of Raja with Rita?
   (A) Uncle  (B) Brother  (C) Maternal Uncle
   (D) Nephew  (E) Can’t be determined

Directions: The Following information pertains to Questions 5-7.

There are six persons S1, S2, S3, S4, S5 and S6.

S3 is the sister of S6.

S2 is the brother of S5's husband.

S4 is the father of S1 and grandfather of S6.

There are 2 fathers, one mother and 3 brothers in the family.

5. Who is S5's husband?
   (A) S2  (B) S3  (C) S1  (D) S4  (E) S6

6. Who is the mother?
   (A) S1  (B) S2  (C) S3  (D) S5  (E) cannot be determined

7. How many male members are there?
   (A) 1  (B) 2  (C) 3  (D) 4  (E) Cannot be determined

Answers and Explanations

Questions (1-4) can be answered with the help of the following diagram.

![Family Tree Diagram]
Questions (5-7) are as per the following diagram.

AGE DOUBTS
This forms a part of logical reasoning which requires the ability to, reason with numbers, and to deal with quantitative materials and ideas using commonsense as well as quick calculation techniques.

In other words, you have to deal with figures for which you should have basic knowledge concerning quick calculations, a list of Algebra, techniques of interpreting data given in the form of tables, puzzles etc.

For instance, go through the following examples and find out how common sense application along with aptitude to solve general mathematical problems can help comprehending these puzzles.

Illustrations
1. 5 years ago, the combined age of my mother and mine was 40 years. Now, the ratio of our age is 4:1. How old is my mother?
   
   (A) 10  (B) 40  (C) 60  (D) 20  (E) 50
   
   Answer:   (B)
   
   Let us suppose, my age today is ‘A’ year.

2. (C)
3. (B)
4. (C)
LOGICAL REASONING

Then my mother’s age, which is four times of my age is 4A. Five years ago, my age would have been (A-5) and that of my mother was (4A-5).

Now, at that time our combined age was 40.

This means (A-5) + (4A-5) = 40.

This leads to 5A - 10 = 40 or A = 10 years.

Thus, today my mother is 4A = 40 years of age.

Therefore, (B) is the right choice.

2. Honey was twice as old as Vani 10 years ago. How old is Vani today if Honey will be 40 years old 10 years hence?

(A) 20 (B) 25 (C) 15 (D) 35 (E) 30

Answer: (A) Honey’s age today is 30 years.

Her age 10 years ago was 20 years.

Vani's age 10 years ago would have been = 10 years.

Therefore, we can conclude that Vani's age today is 20 years and not more.

Therefore, (A) is the right answer.

3. One year ago, a mother was 4 times older to her son. After 6 years, her age become more than double her son's age by 5 years. The present ratio of their age will be?

(A) 13 : 12 (B) 11 : 3 (C) 3 : 1 (D) 25 : 7 (E) 4 : 3

Answer: (D) One year ago if the Son's age was ‘A’ years, then the mother was ‘4A’ years old. After 6 years, we conclude that

4A + 1 + 6 - 2 (A + 1 + 6) = 5,

which leads to A = 6

Now the ratio of their ages today will be

(4A + 1) : (A + 1) = 25 : 7

Therefore, (D) is the right answer.
4. Vandana's mother is twice as old as her brother. She is 5 years younger to her brother but 3 years older to her sister. If her sister is 12 years of age, how old is her mother?

(A) 30  (B) 35  (C) 45  (D) 40  (E) 50

**Answer:** (D) Vandana's age should be 15 years as she is 3 years older to her sister who is 12 years of age. Her brother is therefore 20 years of age and her mother is 40 years old.

5. Sonu is 4 years younger to Manu while Dolly is four years younger to Summit but 1/5 times as old as Sonu. If Sumit is eight years old, how many times as old is Manu as Dolly?

(A) 3  (B) 1/2  (C) 2  (D) 1  (E) 1/4

**Answer:** (A) Dolly age is (8-4) = 4 years and Sonu's is 4 x 4 = 16 years, this means Manu's will be (16 - 4) = 12 years. Therefore, Manu is 3 times older to Dolly.

6. In the above question, Sonu's age will be

(A) 18  (B) 23  (C) 16  (D) 24  (E) 15

**Answer:** (C)

7. Our mother is 3 times as old as my brother and I am 1/3rd times older than my brother. If 4 years ago I was as old as my brother today, what is the age of my brother?

**Answer:** (B) 4 years ago my age was what my brother's age is today. Thus, he is 4 x 3 = 12 years old today and my mother, therefore is 12 x 3 = 36 years of age.
1. Ruchi's age was double that of Niti 2 years ago. If Ruchi was 2 years older to Niti then, try to guess how old she is today?

(A) 6    (B) 4    (C) 8    (D) 2    (E) 20

2. If we add the age of three brothers Sunil, Sanjay and Sonu, then it becomes 60 years today. If 6 years ago the Sonu was of half the age of Sanjay and 1/3rd to the age of Sunil, then find out the present age of Sanjay.

(A) 14    (B) 15    (C) 16    (D) 18    (E) 24

3. Sonu's age is 2/3rd of Manu's. After 5 years Sonu will be 45 years old. Manu's present age is

(A) 55    (B) 56    (C) 58    (D) 60    (E) 64

4. Ratio of Sonu's age to Manu's is equal to 4 : 3. If Sonu will be 26 years old after 6 years, the present age of Manu is

(A) 11    (B) 15    (C) 14    (D) 17    (E) 13

5. Binny is born on 1st October. He is younger to Sunny by one week and two days. If on 1st October it was a Saturday, then Sunny's birthday will come on which day this year?

(A) Wednesday    (B) Thursday    (C) Monday    (D) Saturday    (E) Sunday

6. Binny is half as old as Sunny. Chinky is twice as old as Sunny. How many times is Chinky as old as Binny?

(A) 6    (B) 4    (C) 8    (D) 3    (E) 2

7. My age becomes half that of my brother's if we simply add 2 years to his present age. If I am 25 years old today, my brother will be

(A) 46    (B) 48    (C) 44    (D) 36    (E) 38

8. My age is 2 years less than twice that of my brother. If I am sixteen years old, how old is my brother?

(A) 3    (B) 18    (C) 9    (D) 27    (E) 6

Answers and Explanations
1. (C) Let Niti’s age 2 years ago be ‘A’ years.
   Then, Ruchi’s age was ‘2A’.
   Now, 2A - (A + 2) = 2, this leads to A = 4.
   Thus, Ruchi is 8 years old today.

2. (A) The combined age of three brothers 6 years ago was
   \[(A + 6) + (2A + 6) + (3A + 6) = 60.\]
   \[6A + 18 = 60\]
   \[6A = 42\] or \[A = 7\]
   Now, Sanjay’s age should be \[= 2A = 14\] years.

3. (D) Sonu’s present age is \[(45 - 5) = 40\] years, Therefore, Manu’s age
   should be \[\frac{40 \times 3}{2} = 60\] years.

4. (B) Same as above.

5. (C) Sanjay’s Birthday will be as 10th October. If the 1st is a Saturday
   then 10th will be a Monday.

6. (B)

7. (B) My age is 25, then my brother should be \[(25 \times 2) - 2 = 48\]

8. (B) My age is 16 then my brother should be \[(16 + 2) \times \frac{1}{2} = 9\]

ARRANGEMENT PROBLEMS

In such questions, familiar situations are used as these can be understood
without any lengthy explanations. The situations are straight and with some
loose/tight connections, but no connection is missing.

For example, if the situation describes eight people sitting in a circle and
on eight chairs around a round table — then two people cannot have the same
position or sit on one chair. However, if the situation might be misunderstood,
then an explanatory note to clarify the ambiguity is always provided.

The first step to analyse an arrangement problem or schedule building
problem is to preview the situation. Go through the initial setups quickly
without trying to draw any conclusions. This is to provide content for a more careful second reading.

As you read through the description of the situation for this second time, try to take notes, jotting down the essence of the most important conditions and restrictions. Using tables, columns, diagrams, flowcharts, charts or memory trees can be ample use.

Make a list characters/events and strike off the ones which you eliminate with your logic buildup as you fill up the chart or table during a second reading of the situation. This will make you reach the correct answer quickly.

As you go on filling up your chart/table the answer will become clearer. However, if a question does not contain a thorough information deck and no additional supplies of information are available, then attempt to eliminate four choices by comparing them to an initial description of the situation.

OVERVIEW OF TYPES OF QUESTIONS

(A) Sitting Arrangement Problems
These are the most common situations asked in the examinations. Such situations generally involve three to eight individuals arranged in a certain fashion. One may find the situations such as five men standing in a line or six people sitting around a table in a particular order. Sometimes such questions are made more difficult by allowing more than one individual to a particular position with some conditions.

(B) Schedule Building
These are another type of arrangement questions which define situations in which arrangements are to be made based on time parameters.
The common situations are a student scheduling his classes during a week, part-time employees hired to fulfill a job in a particular time slot etc., or time table building on an airport or bus-stand.

Another type of schedule-building questions includes programme problems, where a series of possible events are described and certain questions are asked based upon that problem.

(C) Transaction Analysis (Symmetrical Relationships)

This type contains situations where selection of candidates or individuals is carried on the basis of certain conditions and restrictions. Also included in this type are situations where the information about characteristics of individuals are present and one individual may or may not possess those characteristics. Common situations include people who speak different languages or belong to different religions or families or possess different cars/dogs, etc.

In most of the analytical reasoning questions, the information provided is not complete and the possible inter-relationships are not specified fully. This leaves a lot for the manipulations of the conditions to analyze the situation and make out inter-relationships. Therefore, when we make use of diagrams or charts to understand the situation, the weak links are highlighted which makes it easier to solve the problem.

Generally, following types of questions are asked from the situation which require you to consider all of the information provided in the situations. The types are

- Analysis questions
- New specifics questions
- New conditions questions

Now, the analysis questions demands is to explore the situation and apply our commonsense to solve the problems. Also included in this type are questions which ask you to determine the possible arrangements, combinations, orders, schedules, time tables, etc. or the number of possibilities or occurrences etc.
When the information is not all that comprehensive and the inter-relationships are missing to a great deal, then a new specific is provided to fill in those missing limits. The questions generally asked in this type are – ‘If this happens, who will go or not go’ or ‘How many chances will be left if this happens?’ e.t.c.

In new condition questions, a new condition is introduced and then analysis of the question is asked for from the very start. Whenever a new condition is applied, certain links or relationships get modified. For such questions, its always better to start with the due modification of your earlier completed structure or diagram, but if the time persuits, one is advised to make a fresh start and put together all the information again as in many cases, the complete linkages or relationships take a twist.

ARRANGEMENT PROBLEMS

Illustrations

Directions (1-3): Study the following statements, marked (A), (B) and (C) and answer the questions given below:

(A) A, B, C, D and E are five boys sitting in a circle

(B) C is sitting immediately to the left of E.

(C) A is sitting between D and E.

For questions 1-3, the following diagram will make the answers clearer.
1. Who is sitting to the immediate left hand side of C?
   (A) E        (B) A        (C) B        (D) D
   Answer: C

2. Who is sitting between B and A?
   (A) C        (B) E        (C) D        (D) None
   Answer: C

3. E is sitting between
   (A) B and D  (B) D and E  (C) B and E
   (D) A and C
   Answer: D

Directions (4-6): Five friends are sitting on a bench in the following order:
(A) P is sitting next to Q, and R is next to S.
(B) S is not sitting with T; T is on the extreme left hand side of the bench and
   R is on second position from the right hand side.
(C) P is on the right hand side of Q and to the right side of T,
(D) P and R are sitting together.

The above data can be plotted as given in the following diagram from which
the answers will be clearer.

4. Who is sitting exactly in the middle?
   (A) Q        (B) R        (C) P        (D) T
   Answer: C

5. Who is sitting to the left of Q?
   (A) S        (B) T        (C) R        (D) P
Practice Questions

Directions (1-3): Six friends are sitting before a dining table in the following order.
A. B is sitting opposite to D.
B. E is sitting opposite to C.
C. A is on the extreme left end of the table facing F.
1. Who is sitting on the left hand side of A?
   (A) D    (B) C    (C) B    (D) E
2. Who is sitting on the right hand side of F?
   (A) B    (B) E    (C) D    (D) C
3. Who is sitting beside B facing D and E?
   (A) D    (B) B    (C) A    (D) F

Directions (4-9): Some friends are sitting on a bench, Sunil is sitting next to Sunita and Sanjay is sitting next to Bindu. Bindu is not sitting with Sumit. Sumit is on the left end of the bench and Sanjay is on second position from right hand side. Sunil is on the right side of Sunita and to the right side of Sunil, Sunil and Sanjay are sitting together. Based on the above sitting arrangements, answer the following questions.

4. Sunil is sitting between
   (A) Sunit and Bindu    (B) Sumit and Bindu
   (C) Sunit and Sanjay   (D) Sanjay and Sumit
   (E) Bindu and Sanjay,

5. Who is sitting in the centre?
   (A) Sumit    (B) Sunil    (C) Bindu    (D) Sanjay    (E) Sunita
6. Sanjay is sitting between
(A) Bindu and Sunita  (B) Sunil and Sumit
(C) Sunita and Bindu  (D) Sumit and Bindu
(E) Sunil and Bindu

7. Sumit is sitting on the
(A) Second place from right  (B) Second place from left
(C) Extreme left  (D) Extreme right
(E) In the middle of all.

8. Bindu is sitting on the
(A) Extreme left side  (B) Extreme right side
(C) Second from left side  (D) Third from left side
(E) In the centre

9. Sunila is sitting how many places away from Bindu?
(A) 1  (B) 2  (C) 4  (D) 5  (E) 3

Answers and Explanations

For questions (1-3), the data can be plotted as follows:

```
    B    C
   / \   / \  
 A   TABLE   F
 / \   / \  
 D   E
```

For questions (4-9) make a sketch of sitting positions based on the description given:

```
LEFT SIDE   RIGHT SIDE
    BENCH
```
ARRANGING LETTERS/ NUMBERS

Directions (1-5): If the word ‘DISINTERESTEDNESS’ is rewritten by reversing the order of first seven and last six letters, then,

1. If all vowels are removed, which letter will have one preceding and one following letter in the same order as in the English alphabet?
   (A) T     (B) D     (C) N     (D) R     (E) S

   Answer: E

2. Which letter will be the 10th letter towards right?
   (A) R     (B) E     (C) T     (D) S     (E) D

   Answer: D

3. Which will be the sixth letter from end towards left?
   (A) R     (B) E     (C) S     (D) N     (E) T

   Answer: C

4. Which consonant will be exactly in the middle?
   (A) T     (B) E     (C) S     (D) E     (E) None

   Answer: E

5. How many vowels are there to the left of the letter exactly in the middle?
   (A) 1     (B) 2     (C) 3     (D) 4     (E) None

   Answer: C

Explanations (1-5): By rewriting the given word as per instructions in the question, the answers will become clearer 'ETNNISIDRESTSSENDE.'
Directions (6-7): If the first three letters of the word 'COMPREHENSION' are reversed, then last three letters are added and then the remaining letters are reversed and added, then

6. Which letter will be exactly in the middle?
   (A) H (B) R (C) S (D) N (E) None
   Answer: C [MOCIONSNEHERP]

7. Which letter will be fifth from the end?
   (A) S (B) R (C) N (D) E (E) I
   Answer: D [MOCIONSNEHERP]

Directions (1-2): Answer the following questions based on the following sequence of alphabets.

   a b c d e f g h i j k l m n o r q s t u v w x y z.

1. Which alphabets are wrongly placed?
   (A) rt/jl (B) m/j (C) vu/jl (D) jl/rq (E) kq/rq

2. How many alphabets are missing and how many repeated?
   (A) None (B) 3 (C) 2 (D) 3 (E) 5

Directions (3-6): The following questions are based on the given sequence of alphabets

   a b c d e g h i j k l m n o p q r s u v w x y z

3. Which letter is missing in the above set of letter?
   (A) j (B) y (C) f (D) v (E) None

4. Which letter is out of its normal position?
   (A) t (B) j (C) d (D) s (E) r

5. How many vowels are there?
   (A) 6 (B) 4 (C) 5 (D) 7 (E) 8

6. Which two letters are sandwiched between two vowels?
   (A) vw (B) hj (C) gh (D) pq (E) np
Answers and Explanations


1. The alphabet ‘j’ is in place of ‘I’ and vice-versa.
   Similarly ‘r’ is in place of ‘q’ and vice-versa.

2. The alphabet ‘p’ is missing and ‘u’ is repeated. Hence, one alphabet is missing and one is repeated.

Transactional Analysis

Illustrations

Directions: For each of the following, read the information given and answer the question based on that data.

1. (a) A is richer than B,
   (b) C is richer than A.
   (c) D is richer than C.
   (d) E is the richest of all.

   If they are made to sit in the above degree of riches who will have the medial position (central position)?
   (a) A (b) B (c) C (d) D (e) E

   Answer: (C) E is the richest of all; therefore, he is richer than D. The above relationship can be denoted by E > D > C > A > B, where ‘>’ stands for ‘richer than’.

2. (a) Radha is younger to Sunita but elder to Rita
   (b) Rita is elder than Geeta
   (c) Sham is older to Rita but younger to Radha who is youngest of all?
   (a) Rita (b) Sham (c) Sunita (d) Geeta (e) Radha

   Answer: (d) Sunita > Radha > Sham > Rita > Geeta

3. (a) Lata is a year older than Sunita
   (b) Sunita is two years older than Bindu
   (c) Rajan is a year older than Bindu,
Who is the youngest of all?

(a) Sunita  (b) Lata  (c) Bindu  (d) Rajan  (e) Can't be determined

Answer:  (C) Lata > Sunita > Rajan > Bindu

4. Which one plays badminton, football and hockey?
(a) A  (b) B  (c) C  (d) D  (e) None

Answer:  (a)

5. One who plays badminton, football and cricket is:
(a) A  (b) B  (c) C  (d) D  (e) None

Answer:  (c)

6. One who plays cricket, football and hockey.
(a) A  (b) B  (c) C  (d) D  (e) None

Answer:  (b)

7. One who does not play cricket
(a) A  (b) B  (c) C  (d) D  (e) None

Answer:  (a)

Explanations (4-7):
Players who play football = A, B, C
Players who play hockey = A, B, D
Players who play badminton = C, D, A
Players who play cricket = C, D, B

**Practice Questions**

*Directions:* A goldsmith has five gold rings, each having a different weight

Statement (1): Ring D weighs twice as much as ring E
Statement (2): Ring E weighs four and one-half times as much as ring F.
Statement (3): Ring F weighs half as much as ring G.
Statement (4): Ring G weighs half as much as ring H
Statement (5): Ring H weighs less than ring D but more than ring F.

Based on the above statements, answer the following questions

1. Which of the following represents the descending order of weights of the rings?
   (a) D, E, G, H and F  
   (b) E, G, H, D and F  
   (c) H, F, G, D and E  
   (d) F, D, G, E and H  
   (e) D, E, H, G and F

2. Which of the numbered statements above is not necessary to determine the correct order of the rings according to their weights?
   (a) Statement 1  
   (b) Statement 4  
   (c) Statement 3  
   (d) Statement 2  
   (e) Statement 5

3. Which of the following is the lightest in weight?
   (a) Ring D  
   (b) Ring E  
   (c) Ring F  
   (d) Ring G  
   (e) Ring H

4. If these rings are sold according to their weights as it is, which ring will fetch highest value in rupees?
   (a) G  
   (b) H  
   (c) F  
   (d) D  
   (e) E

5. Ring H is heavier than which of the following two rings?
   (a) GE  
   (b) GH  
   (c) DF  
   (d) DE  
   (e) EG

**Answers:**
1. (e)  2. (e)  3. (c)  4. (d)  5. (b)

**Explanations (1-5):** Read through the statements; write down the letters for the rings; identify the ring with the lowest weight; assign it a value ‘x’

D   E   F   G   H
  x

Read through the statements again and fill in the weight relative to weight of ring F

D   E   F   G   H
9x   4.5x   x   2x   4x

Now answers are easy to find.

**TEST PAPER - 1**

**Immediate Inference**

1. **Statements:** All peons are managers.
   All managers are clerks.

**Conclusion**

1. All peons are clerks.
2. All clerks are peons.

2. **Statements:** All managers are peons.
   Some peons are clerks.

**Conclusion**

1. No manager is a clerk.
2. Some clerks are managers.

3. **Statements:** All families are guests.
   No guest is host.

**Conclusion**

1. No family is host.
2. No bachelor is invited in the purity.

Mediate inference/Syllogism.
4. **Statement:** Every Indian living outside India is an NRI.
The Indians love India.

**Conclusions**
1. Indians living in Europe are not NRIs.
2. The NRIs do not love India.

5. **Statement:** Frogs live in water as well as on land.
Fish live in Water.

**Conclusions**
1. Frogs and Fish are species of the same animal family.
2. Frog and fish, both can live in water.

6. **Statement:** Burning body fats is necessary for a good figure. Ranjeev maintaining good figure.

**Conclusions**
1. Ranjeev may be burning body fats by exercising daily.
2. All friends of Ranjeev have good figure.

7. **Statement:**
All gates are mates. All mates are fates.

**Conclusions**
1. All fates are gates.
2. All gates are fates.

8. **Statement:**
Some books are novels.
Some novels are epics.

**Conclusions**
1. Some books are epics.
2. Some epics are books.

9. **Statement:** All rats are mats.
Some mats are meats.
Conclusions
1. Some mats are rats.
2. Some meats are cats.

Assumptions and Conclusions
10. (i) Ashish is a driver. So, Ashish is a smoker.
    (ii) Drivers are smokers.
11. (i) Sparows are not green and are difficult to shoot.
    Therefore, parrots are not difficult to shoot
    (ii) Parrots are green.

Questions (12-15) are as per below diagrams:

12. Graduate, hard-working and honest rural people are indicated by
    (A) 1    (B) 2    (C) 3    (D) 4    (E) 5
13. Rural people who are hard-working and graduates but not honest are indicated by
    (A) 1    (B) 2    (C) 3    (D) 4    (E) 5
14. Urban graduates who are neither hard working nor honest are represented by
    (A) 5    (B) 10   (C) 11   (D) 4    (E) 7
15. Rural graduates who are neither honest nor hard-working are indicated by
    (A) 6    (B) 2    (C) 4    (D) 3    (E) 9

Questions (16-19) are as per the below diagram
16. Which of the following statements is true?
    (A) All urbans are post graduates.
(B) All post graduates are urbans.
(C) All professors are urban people.
(D) All rural people are professors.

17. Choose the correct statement.
   (A) There are some professors who are rural people.
   (B) No professor is urban.
   (C) All post-graduates are rural.
   (D) All post-graduates are urban.

18. Which of the following statements is true?
   (A) All rural peoples are professors.
   (B) There are some rural people who are post-graduate and professors.
   (C) All rural people are post-graduates.
   (D) All professors are rural but not post-graduates.

19. Mark the correct statement.
   (A) All urban people are post-graduates.
   (B) All rural peoples are professors.
   (C) Some professors are rural but not urban.
   (D) Some urban people are not post graduates.

Questions (20-24) are as per the below diagram:

20. Lions, Dens, Sick-animals

21. Rajiv Gandhi, Prime Ministers of India, Indian Citizens

22. Africa, Earth, Universe

23. Comb, Nails, Hair

![Diagram (a)](image1.png)

![Diagram (b)](image2.png)
24. Cricketers, Athletes, Dogs

Questions (25-27) are as per the below diagram:

25. Sisters, Mothers, Nurses

26. Asians, Indians, Punjabis

27. Things mode of paper, Napkins, White objects

Logical Deductions

28. Statements:

(A) Some parrots are pigeons.

(B) All pigeons are crows.

Conclusions

I. Some parrots are crows.

II. All parrots are crows.

III. Some crows are parrots.

IV. All pigeons are parrots.

(a) None of the conclusions follow.

(b) All the conclusions follow.
(c) Only II and IV follow.
(d) Only I and III follow.

29. Statements:
(A) All clerks are typists.
(B) Some typists are stenos.

Conclusions
I. Some stenos are clerks.
II. No steno is a clerk.
III. All typists are clerks.
IV. All clerks are stenos.
(a) All the conclusions follow.
(b) None of the conclusions follow.
(c) Either I or II follows.
(d) Only IV follows.

30. Statements:
(A) All notebooks are highlighter pens.
(B) All highlighter pens are blue.

Conclusions
I. Some blues are notebooks.
II. No blue is a notebook.
III. All blues are notebooks.
IV. All highlighter pens are notebooks.
(a) None of the conclusions follow.
(b) All the conclusions follow.
(c) Only I follows.
(d) Only II and IV follow.

Analysis of Statements
31. Statement: Should Indian rupee be made equivalent to the US Dollar
Arguments
X. Yes, this will help reduce our import bill.
Y. No, this is not possible.

32. Statement: Should computers be used in banks?

Arguments
X. Yes, this will reduce the scams.
Y. No, it will replace men, who will then die with hunger.

33. Statement: Should education for girl-child be made free?

Arguments
X. Yes, as this will uplift the status of girls in the coming generations.
Y. No, as this will be an assault on equality of sexes in society.

Family/Blood Relation Questions
The following information pertains to Questions 34-37.

Asha and Dara are children of Mr. Dass.
Asha marries Suresh Chopra and Sunil, Sanjay and Sonu are born to them.
Sunil is married to the eldest daughter of Mr. and Mrs. Roy.
Bindu is younger to Rita and older than Sita and all are daughters of Mr. and Mrs. Roy.
Gita is Sunil's daughter.

34. What is Sanjay's Surname?
   (A) Dass (B) Roy (C) Chopra (D) None
   (E) Cannot be determined

35. Who is married to Sunil?
   (A) Bindu (B) Sita (C) Rita (D) Meena (E) None

36. How is Dara related to Sonu?
   (A) Brother-in-law (B) Uncle (C) Maternal uncle
   (D) Brother (E) None

37. What is Gita's Surname?
   (A) Chopra (B) Roy (C) Dass (D) Suresh (E) None
**Age Doubts**

38. The ratio between Kishor Rahi and his father's age is 1:4, if 5 years ago, his father was 7 times older to him at that time, what is Kishor's age today?

(A) 30  (B) 40  (C) 60  (D) 28  (E) 32

39. The average age of 2 daughters of Mrs. Mathews is 15 years. If the age of Mrs. Mathews is added, the average becomes 20 years, how old is Mrs. Mathews?

(A) 35  (B) 60  (C) 55  (D) 45  (E) 50

40. Mrs. Malik is twice as old as her daughter Manu. 20 years ago, the age of Mrs. Malik was 12 times Manu's age. Calculate how old Mrs. Malik is today?

(A) 40  (B) 45  (C) 60  (D) 50  (E) 44

**Arrangement Problems**

Directions: (Q.41-44) The following statements describe the relative hierarchy of employees in an organization

(i) Kuldeep is the immediate boss of Raveesh
(ii) Vaneet is Sheetal's boss.
(iii) Raveesh works under Rohit.
(iv) Suchita is Vaneet's boss.

41- Which of the following statements is necessarily true?

(A) Kuldeep is Sheetal's boss.
(B) Raveesh is Suchita's boss.
(C) Suchita is Sheetal's boss.
(D) Vaneet works under Kuldeep.
(E) Rohit is superior to Sheetal

42. If Vaneet is superior to Manoj, then

(A) Rohit is superior to Sheetal.
(B) Rohit is superior to Manoj.
(C) Suchita is superior to Manoj.
(D) Raveesh is superior to Manoj.
(E) Raveesh is superior to Kuldeep.

43. Which of the following statements cannot be true?
   (A) Raveesh is Vaneet's boss
   (B) Kuldeep is Suchita's boss.
   (C) Rohit is Suchita's boss.
   (D) Kuldeep is Rohit's boss.
   (E) Vaneet and Kuldeep have the same level in the hierarchy

44. If Vinay is the immediate boss of Kuldeep, then
   (A) Rohit is Vinay's boss.
   (B) Suchita is Vinay's boss.
   (C) Raveesh is Vinay's boss.
   (D) Sheetal is Vinay's boss.
   (E) Vinay is Vaneet's boss.

Direction: Ques. (45-47) are based as following sequence:

    m n m n m m n m m u u m n m n m m m n

45. How many m’s are preceded by ‘n’ and followed by m?
   (a) 1  (b) 2  (c) 3  (d) 4  (e) None

46. How many n’s are preceded and followed by x?
   (a) 1  (b) 2  (c) None  (d) 3  (e) 5

47. How many m's are preceded and followed by m?
   (a) 1  (b) 2  (c) None  (d) 3  (e) 4

Transactions Analysis

Study the following statements and answer the question which follows:

   (i) Ashu is taller to Bindu
   (ii) Cheena is taller than Ashu.
   (iii) Deepu is taller than Cheema.
   (iv) Sunil is tallest of all.
48. If they are made to stand in a line according to their heights, who will be at the center?

(a) Ashu  (b) Deepu  (c) Bindu  (d) Cheema  
(e) Difficult to find

Answers and Explanations (TEST PAPER - 1)

1. (A) \( A + A = A \)
2. (D) \( I + I = \text{Non conclusion} \)
3. (A) \( A + E = E; \text{conclusion (2) is irrelevant} \)
4. (B)
5. (B)
6. (A)
7. (B)
8. (D)
9. (A)
10. (A) Both are relational arguments.
11. (B) None of the assumptions suggest that green coloured birds are easy to shoot.
12. (A)
13. (B)
14. (E)
15. (A)
16. (C)
17. (A)
18. (B)
19. (D)
20. (C)
21. (E)
22. (A)
23. (A)
24. (C)
25. (B)
26. (E)
27. (B)
28. (A)

From statements A and B, some parrots and all pigeons are crows, implies that some parrots are crows. Therefore conclusion I follows. Again from statement A, some parrots are pigeons, therefore some crows are parrots. Hence conclusion I follows. As it is not given in the choices, the answer will be (a) None of the conclusions follow.

29. (c)
30. (C)

31. (B)
32. (E)
33. (A)
34. (C)
35. (C)
36. (C)

37. (C)  Fig. For Ques. 34-37
38. (B)
39. (A)  Mrs. Mathews’ will be \((4 \times 20 - 3 \times 15) = 80 - 45 = 35\) years.

40. (E)
41. (C)
42. (C)
43. (D)  Figs. for Ques. 41-44
44. (A)  If Vinay is Kuldeep's boss, then Rohit must be Vinay's boss.
Since Kuldeep is the immediate boss of Raveesh and also Raveesh is under Rohit, Rohit must be superior to Kuldeep.
Also Suchita is superior to Vaneet and Vaneet is superior to
Sheetal, thus Suchita is superior to Sheetal. The figure will help you understand the hierarchy.

45. (C)
46. (C)
47. (B)
48. (D)
49. (C)
50. (C)

**Q.49-50**

Students who have Physics: A, B, C
Students who have Chemistry: A, B, D
Students who have Botany: C, D, A
Students who have Zoology: C, D, B

**TEST PAPER – 2**

**Immediate Inference**

1. **Statements:** Some tomatoes are peas.
   
   Some peas are beans.
   
   **Conclusion**
   
   1. Some tomatoes are beans.
   
   2. Some beans are tomatoes.

2. **Statements:** Some fish are cakes.
   
   All cakes are biscuits.
   
   **Conclusion**
   
   1. All biscuits are cakes.
   
   2. Some biscuits are Cakes.

3. **Statements:** All cakes are breads.
   
   No bread is roasted.
   
   **Conclusion**
   
   1. No cakes are roasted.
2. Some breads are cakes.

Syllogism

4. **Statement**: More than half of pears are grapes.
   The remaining are bananas.

   **Conclusions**
   1. Grapes are more in number than bananas.
   2. Only very good pears are bananas.

5. **Statement**: All nurses are beautiful.
   Some girls are nurses.

   **Conclusions**
   1. All beautiful nurses are girls.
   2. Some girls are beautiful.

6. **Statement**: Some cakes are candies.
   Some candies are ice-creams.

   **Conclusions**
   1. Some cakes are ice-creams.
   2. Some ice-creams are cakes.

7. **Statement**: All toys are lamps.
   All taps are lamps.

   **Conclusions**
   1. All toys are taps.
   2. Some taps are toys.

8. **Statement**: All researchers are teachers.
   Some teachers are students.

   **Conclusion**
   1. No researcher is a student.
   2. Some students are researchers.

9. **Statement**: More than half the people know English.
The remaining knows Tamil.

**Conclusions**

1. People who know English are more in number than those who know Tamil.
2. Only very intelligent people know Tamil.

**Assumptions and Conclusions**

10. (i) Discipline is based on law.
    (ii) Law has nothing to do with success. So, Discipline is opposed to success.

11. (i) Students are teachers.
    (ii) Athletes are teachers. So, Athletes are student.

**Logical Diagrams**

(Questions 12 – 19)

Triangle represents educated youth.

Small circle represents youth from backward classes.

Large circle represents employed youth.

12. How many educated youths are unemployed?
    (A) 8  (B) 11  (C) 3  (D) 6  (E) 19

13. How many youths uneducated are from backward classes?
    (A) 18  (B) 14  (C) 3  (D) 22  (E) 6

14. How many educated youths are employed?
    (A) 18  (B) 20  (C) 15  (D) 9  (E) 11

15. How many educated youths are from backward classes?
    (A) 28  (B) 14  (C) 6  (D) 9  (E) 20

16. How many uneducated youths from backward classes are employed?
    (A) 7  (B) 11  (C) 14  (D) 5  (E) 3

17. How many youths are unemployed?
18. How many youths are employed?
   (A) 12  (B) 16  (C) 10  (D) 21  (E) 14

19. How many youths from backward classes are employed?
   (A) 7  (B) 11  (C) 15  (D) 8  (E) 13

Questions 20-27:

(a)  
(b)  
(c)  
(d)  
(e)  

20. Popes, Catholics, Protestants

21. Illiterate people, blind creatures, people who can read Hindi

22. Abraham Lincoln, US Presidents, Males

23. People, Parakeets, Individuals than can walk on two legs.

24. Schizophrenics, Mentally retarded people, geniuses

25. Automobile drivers, Students, Indians

26. People, Husbands, Males with more than two males

27. Soil, Plants, Azaleas.

Logical Deductions

28. Statements:
(A) All men are animals.
(B) No woman is a man or None of the women are men.

Conclusions
I. No woman is an animal.
II. All women are animals.
III. All animals are women.
IV. Some women are men.

(a) Only I follow.
(b) Only II follows.
(c) None of the conclusions follow.
(d) Only III follow.

29. Statements:
(A) Some pens are books,
(B) All books are red.

Conclusions
I. All red are pens.
II. Some red are pens.
III. All pens are books.
IV. No pen is red.

(a) All the conclusions follow.
(b) None of the conclusions follow.
(c) Only I follow.
(d) Only II follows.

30. Statements:
(A) All flowers are buds.
(B) Some buds are plants.

Conclusions
I. Some plants are flowers.
II. No plant is a flower.
III. All flowers are plants.
IV. All buds are plants.
(a) Either I or II follow.
(b) Neither I nor II follows.
(c) All the conclusions follow.
(d) None of the conclusions follow.

31. **Statement:** Should MNCs be allowed to enter into India?

**Arguments**

X. Yes, they would bring in more money?
Y. No, they will start ruling us after some years?

32. **Statement:** Should prices of gold be cut down to one fourth of what is prevalent today?

**Arguments**

X. Yes, people will start buying more gold.
Y. No, People no longer buy Gold.

**Family/Blood Relation Qualms**

33. There are six persons — S1, S2, S3, S4, S5 and S6.
   — S3 is the sister of S6.
   — S2 is the brother of S5’s husband.
   — S4 is the father of S1 and grandfather of S6.
   — There are two fathers, one mother and three brothers in the family.

   How is S6 related to S5?
   (A) Husband  (B) Son  (C) Father  (D) Daughter  (E) Uncle

Following information pertains to Questions 34-36.
   — In a family of Suresh three generations are living together.
   — The family consists of two married couples having two children each.
   — Gopal is lucky to have two grandchildren.
   — There are two housewives and both are beautiful.
— Gopal who is Manoj's father, is a lawyer and earns the most.
— Iyotsna is the sister of a lecturer and herself is a nurse.
— Anuradha is married to a lecturer who is Nidhi's son.
— Jyotika is the grand-daughter of one of the housewives and is a classical dancer.

34. What is Manoj's profession?
   (A) Student  (B) Lecturer  (C) Lawyer
   (D) Cannot be determined  (E) None of these.

35. How many male members are there in the family?
   (A) 2  (B) 3  (C) 4
   (D) Cannot be determined  (E) None of these

36. Which of the following statements is not true?
   (A) The nurse is sister-in-law of the housewives.
   (B) Gopal has two grand children.
   (C) Nidhi has a son and a daughter.
   (D) Gopal has two children.
   (E) Anuradha has a son and a daughter.

Age Doubts
37. Sonu and Manu's age ratio is 4 : 3. If sum of their ages is 28 years, the ratio of their ages after 8 years will be
   (A) 5 : 4  (B) 2 : 3  (C) 5 : 6  (D) 3 : 2  (E) 1 : 4

38. Ratio of Dolly and Vandana's age is 2 : 3 and the sum of their ages is 60 years. How old is Dolly?
   (A) 12  (B) 16  (C) 24  (D) 30  (E) 20

39. The average age of 10 boys in a hostel comes out to be 14. A new admission brought down their average age by one year. How old must the new recruit be?
   (A) 4  (B) 5  (C) 12  (D) 3  (E) 11

Arrangement Problems
40. The following statements describe the relative hierarchy of employees in an organization.

   (i) Kuldeep is the immediate boss of Raveesh
   (ii) Vaneet is Sheetal's boss,
   (iii) Raveesh works under Rohit.
   (iv) Sunita is Vaneet's boss.

If Raveesh is boss of Suchila, then
I. Raveesh is Sheetal's boss
II. Kuldeep is Vaneet's boss.
III. Rohit is Suchila's boss.

(A) I only       (B) II only       (C) III only  (D) I and II only
(E) I, II and III only.

Directions:  (Q. 41-43) Four couples are invited to a dinner party. They will be seated at a circular table. Following are the seating conditions.

   (i) Geeta refuses to sit next to Ali.
   (ii) Lata wants to be between Tilak and Hari.
   (iii) Champa refuses to sit next to Farooq.
   (iv) Niti is seated on Ali's right hand side,
   (v) Farooq and Tilak are seated exactly opposite each other.
   (vi) The seating arrangement is such that one woman is always between two men.

41. Which of the following is the only possible seating arrangement to suit the above conditions?

   (A) Niti is seated to the left of Tilak.
   (B) Lata is seated between Geeta and Farooq.
   (C) Champa is seated exactly opposite Geeta.
   (D) Farooq is seated next to Champa.
(E) Ali is seated to the right hand side of Geeta.

42. Which of the following combinations is not found at the false?
   (A) Geeta, Farooq, Lata
   (B) Ali, Champa, Tilak
   (C) Hari, Lata, Tilak
   (D) Farooq, Niti, Ali
   (E) Hari, Geeta, Farooq

43. Which of the following statements are correct?
   I. Ali is on Champa's right
   II. Lata is on Tilak's left
   III. Farooq is between Niti and Geeta
   (A) I only       (B) II only        (C) III only   (IV) I and II only   (E) I, II and III

Directions: If the first four letters of a foreign term ‘H I P P N O W A D I A S M’ are written in reverse order, next five letters are written without changing their order and then the remaining letters are again written in reverse order, then

44. Which letter will be exactly in the middle?
   (a)      (b)      (c)      (d)      (e)

45. Which letter will be sandwiched between 2 vowels?
   (a)      (b)      (c)      (d)      (e)

46. Which letter will be preceding two adjoining vowels?
   (a)      (b)      (c)      (d)      (e)

47. How many vowels are to the left of W?
   (a)      (b)      (c)      (d)      (e)

Transactions Analysis

48. A goldsmith has five gold rings each having a different weight.
   (i) Ring D weighs twice as much as ring E.
(ii) Ring E weighs four and one-half times the weight of ring F,
(iii) Ring F weighs half the weight of ring G.
(iv) Ring G weighs half the weight of ring H.
(v) Ring H weighs less than ring D but more than ring F.

Ring H is lighter in weight than which of the other two rings?
(a) GH    (b) DE    (c) DF    (d) GE    (e) EG

Questions (49-50): Study the following statements and answer the questions that follows:

(i) Bengalis and Tamils are politicians, poets and warriors.
(ii) Tamils and Punjabis are politicians, warriors and mathematicians
(iii) Punjabis and Gujaratis are politicians, businessmen and mathematicians.
(iv) Gujaratis and Kashmiris are businessmen, poets and mathematicians.
(v) Bengalis and Kashmiris are businessmen, poets and warriors.

49. Name the people who are politicians, businessmen, poets and mathematicians.
   (a) Bengalis    (b) Tamils    (c) Punjabis    (d) Gujaratis    (e) Kashmiris

50. The people who are politicians, businessmen, poets and warriors.
   (a) Bengalis    (b) Tamils    (c) Punjabis    (d) Gujaratis    (e) Kashmiris

Answers and Explanations (TEST PAPER - 2)

1. D. I + L = No conclusion.
2. B. A + I leads to no conclusion, but statement (2) can directly be converted to statement (1), then (2) follows,
3. E A + E = E, which leads to the conclusion that ‘No cakes are roasted’, but also note that statement (1) can be converted into conclusion (2) directly. Thus, both the conclusion follows.
4. A
5. B
The assumptions are relational propositions whereas the conclusion is categorical.

Both are relational.
30 (a)

31. E
32. D
33. A
34. B
35. D
36. E

GC – Grand Children
AC – Another Child
37. A Let Sonu’s age be 4A and Manu’s 3A
   Then, 4A + 3A = 28 = A = 4
   Sonu’s age = 16 years and Manu’s age = 12 years
   Ratio after 4 years will be 16 + 4 : 12 + 4 = 20 : 16 = 5 : 4

38. C

39. D New average is 13 years.
   Now, (11 * 13 – 10 * 14) = 143 - 140 = 3 years

40. E If Raveesh is Sunita’s boss the order will become:
    ROHIT > KULDEEP > RAVEESH > SUCHITA > VANEET > SHEETAL

41. C

42. A

43. E Fig. for Ans. 41-43

44. E HIPPNOWADIASM

45. D OWA

46. E SAI

47. B O and I

48. B

49. D

50. A
Q. 49-50  People who are politicians: Gujaratis, Bengalis, Tamilians and Punjabis.
People who are poets: Gujaratis, Bengalis, Tamilians and Kashmiris
People who are warriors: Bengalis, Tamilians, Punjabis and Kashmiris.
People who are mathematicians: Gujaratis, Tamilians, Punjabis and Kashmiris
People who are businessmen: Gujaratis, Bengalis, Punjabis and Kashmiris

TEST PAPER - 3

Immediate Inference

1. **Statements**: Some coats are jackets.
   No jacket is brown.
   **Conclusions**
   1. Some coats are brown.
   2. Some jackets are coats.

2. **Statements**: Some stones are diamonds.
   All diamonds are rare.
   **Conclusions**
   1. Some stones are rare.
   2. Some diamonds are stones.

3. **Statements**: Some marbles are stones,
   All stones are glasses.
   **Conclusion**
   1. All glasses are stones.
   2. Some glasses are stones.

4. **Statements**: All ships are birds.
   All birds are coins.
Conclusion
1. All coins are ships.
2. All ships are coins.

6. **Statements:** Some papers are notes.
   
   Some notes are documents.

   **Conclusions**
   1. Some notes are papers.
   2. Some documents are notes.

6. **Statements:** Some athletes are graduates.
   
   Some graduates are cricketers.

   **Conclusions**
   1. Some athletes are cricketers.
   2. Some cricketers are athletes.

7. **Statements:** All singers are listeners.
   
   No listener is moody.

   **Conclusions**
   1. No singer is moody.
   2. All listeners are singers.

8. **Statements:** Some cakes are trees.
   
   Chocolate is a cake.

   **Conclusions**
   1. Chocolate is not a cake.
   2. Some trees are cakes.

**Assumptions and Conclusions**

9. (i) Most girls are beautiful.
   (ii) Most girls are unmarried.
   
   So, some beautiful girls are married.

10. (i) All ants are birds,
(ii) All birds are flies.
So, all flies are ants.

Reasoning Logical Diagrams

Questions (11-15) Directions

1. The rectangle represents men.
2. Circle represents graduates.
3. Triangle represents skilled persons.
4. Square represents employed persons.

11. The skilled employed men who are graduates are
   (A) Only 12 (B) Only 3 (C) Only 9 (D) 3 and 11

12. The skilled employed men who are not graduates are
   (A) 3 and 11 (B) Only 6 (C) only 12 (D) 6 and 9

13. The skilled unemployed men who are not graduates are
   (A) 5 (B) 6 and 9 (C) 6 (D) 11 and 16

14. The skilled employed women who are graduates are
   (A) 3 and 4 (B) Only 15 (C) 4 and 13 (D) Only 8

15. The skilled unemployed women who are not graduates are
   (A) Only 12 (B) 4 and 6 (C) 11 and 16 (D) Only 6
Questions (16-20)

16. Some clerks are graduates.
   (A) e   (B) h   (C) g   (D) f
   (E) Cannot be determined

17. Some clerks are government employees.
   (A) e   (B) h   (C) g   (D) f
   (E) Cannot be determined

18. Some graduates are government employees but not clerks.
   (A) h   (B) g   (C) f   (D) e   (E) e and f

19. Clerks who are graduates as well as government employees.
   (A) e   (B) f   (C) g   (D) h
   (E) Cannot be determined.

20. Some graduates are clerks but not working in any government departments.
   (A) f   (B) g   (C) h   (D) e   (E) A

Questions (21-27):

(a)  
(b)  
(c)  
(d)  
(e)  
(f)  

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21. Soccer players, Chess players, Athletes
22. Squares, Rectangles, Geometric figures
23. Edible things, Plants, Coriander-leaf
24. Animals, Cats, Dogs
25. Indians, Pakistanis, Aryans
26. Students, Collegiates, School-goers.
27. George Washington, Presidents of USA, Living peoples.

28. Statements: (A) All cooks are cheats.
   (B) All cheats are barbers.

Conclusions
I. All cooks are barbers.
II. All barbers are cooks.
III. All barbers are cheats.
IV. Some cooks are cheats.
(a) All the conclusions follow.
(b) Only I follows.
(c) Either I or II follows.
(D) Only I & IV follow.

29. Statements: (A) Some dogs are doors.
   (B) All doors are bats.

Conclusions
I. Some dogs are bats.
II. All dogs are bats.
III. Some bats are dogs.
IV. All bats are dogs.
(a) All the conclusions follow.
(b) None of the conclusions follow.
(c) Only II and IV follow.
(d) Only I and III follow.

Analysis of Statements

30. **Statement:** Should kissing be allowed on TV?

   **Arguments**
   
   X. Yes, A natural art should not be banned.
   Y. No, it has an adverse effect on children.

31. **Statement:** Should higher education be made free?

   **Arguments**
   
   X. Yes, this will generate more graduates every year.
   Y. No, it will be unfair to impose the burden on the tax payee.

Family/Blood Relation Qualms

The following information pertains to Questions (32-33)

– In a family of seven, three generations are living at a time.
– The family contains 2 married couples having 2 children each.
– Gopal is lucky to have two grand children.
– There are two housewives and both are beautiful.
– Father of Manoj, Gopal is a lawyer and earns the most.
– Jyotsna is the sister of a lecturer and herself is a nurse.
– Anuradha is married to a lecturer, who is the son of Nidhi.
– Jyotika is grand daughter of one of the housewives and is a classical dancer.

32. Who are the children of Nidhi?

   (A) Jyotsna and Manoj
   (B) Anuradha and Jyotsna
   (C) Anuradha and Manoj
   (D) Cannot be determined
   (E) None
33. Who among the following is one of the married couple?
   (A) Gopal-Jyotika                     (B) Nidhi-Gopal
   (C) Manoj-Jyotika                    (D) Cannot be determined
   (E) None

Following information pertains to Questions (34-35)

Mrs. and Mr. Sharma have two kids Ahsa and Shashi. Shashi married
Radha, daughter of Mrs. Mahajan. Suresh, son of Mrs. Mahajan marries
Rita. Sonu and Rocky are born to Suresh and Rita. Uma and Sudha are the
dughters of Shashi and Radha.

34. What is the surname of Sonu?
   (A) Mahajan                    (B) Sharma               (C) Shashi
   (D) Cannot be determined       (E) None

35. How is Suresh related to Sudha?
   (A) Brother                    (B) Maternal Uncle     (C) Uncle
   (D) Cousin                     (E) Cannot be determined

Age Doubts

36. Ravi is as much younger to Nitin as he is older to Lokesh. If the sum of
ages of Nitin and Lokesh is 24 years, how old is Ravi?
   (A) 10                        (B) 12                (C) 24
   (D) 48                        (E) 6

37. Ratio of Raveesh and his wife's age is 4 : 3. Raveesh will be 24 after 4
years. How old is his wife?
   (A) 12                        (B) 15                (C) 16
   (D) 10                        (E) 14

38. Ratio of Lokesh's age to his mother's age is 4 : 7. The difference between
their ages is 33 years. How old is Lokesh today?
   (A) 44                        (B) 33                (C) 11
   (D) 30                        (E) 60

Arrangement Problems

Directions: (Questions 39-41)
The symbols $, ¥, £, Φ, ε, β$ and γ describe integers which are out of numerical order or they stand, but which could be arranged in a consecutive numerical order.

(A) ¥ is the average of ε and β  
(B) γ is greater than $ 
(C) $ is $( Φ + 2)$  
(D) £ is $(γ + 3)$  
(E) £ is $(¥ - 2)$

39. Which of the following statements is true?

I. ¥ is halfway between ε and β.  
II. If β is even, then ε is odd.  
III. If β is odd, then £ is odd.

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

40. The integer halfway between £ and Φ is

(A) γ  
(B) β  
(C) $  
(D) ¥  
(E) ε

41. If ∑ is an additional integer, which must be false?

(A) ∑ is 5 less than £ and 2 less than β  
(B) ∑ is four more than £ and 3 more than ε  
(C) ∑ is greater than $  
(D) ¥ is greater than ∑.  
(E) ∑ is 2 less than β and 2 more than γ.

Directions: The following questions (42-46) are based on the given sequence of numbers:

8 9 6 7 3 9 3 7 8 3 9 9 5 6 3 9 6 9 3 9 8

42. How many 9’s are there which are preceded by 3 but not immediately followed by 9 in the above set of numbers?

(a) 1  
(b) 4  
(c) 5  
(d) 2  
(e) 3

43. Which digit has least frequency in the above set of figures?

(a) 8  
(b) 9  
(c) 5  
(d) 6  
(e) 3
44. Which digit has the highest frequency leaving digit 9 in the above set of numbers.
   (a) 8     (b) 7     (c) 5     (d) 3     (e) None

45. There are pairs of adjoining figures which add up to 12. How many such pairs are there?
   (a) 1     (b) 2     (c) 3     (d) 6     (e) None

46. How many 3’s are there, not preceded by 9 but immediately followed by 9?
   (a) 2     (b) 3     (c) 4     (d) 5     (e) 1

Schedule Building

Questions (47-50):

Five friends Lokesh, Manoj, Gopal, Raveesh and Rohit have agreed to work together on a part-time job offered by a local restaurant. The restaurant opens five days a week and this group have following schedules when they can work:

(i) Neeraj and Raveesh can work on Monday, Tuesday and Wednesday.
(ii) Raveesh and Rohit can work on Monday, Wednesday and Thursday.
(iii) Rohit and Lokesh can work on Monday, Friday and Thursday.
(iv) Lokesh and Manoj can work on Friday, Tuesday and Thursday.
(v) Neeraj and Manoj can work on Friday, Tuesday and Wednesday.

47. Which one of the five friends cannot work on Thursdays?
   (a) Neeraj   (b) Raveesh   (c) Rohit   (d) Lokesh   (e) Manoj

48. Which is the one who cannot work on Tuesdays?
   (a) Neeraj   (b) Raveesh   (c) Rohit   (d) Lokesh   (e) Manoj

49. Name the person who cannot work on Fridays.
   (a) Neeraj   (c) Rohit   (e) Manoj   (b) Raveesh   (d) Lokesh

50. Which one among the group cannot work on Monday?
   (a) Neeraj   (c) Rohit   (e) Manoj   (b) Raveesh   (d) Lokesh

Answers and Explanations (TEST PAPER - 3)
1. B  Conclusion (1) is invalid from statements, we reach the conclusion that some coats are not brown, i.e. $I + E = O$. But this conclusion is not given. However statement (1) can be directly converted into conclusion (2).

2. E  Conclusion (1) follows an $I + A = I$. But also conclusion (2) follows as it can be directly derived from converting statement (1).


10. D  All fliers may or may not be ants, but all ants must be fliers.


29. D  From statements A and B, some dogs are bats and all doors are bats, implies that some dogs are bats. Therefore, conclusion I follows. From statement A again, some dogs are bats, therefore some bats are dogs. Therefore conclusion III follows.

30. B  31. B
32. A 
33. B 

For explanation, see Figure given for Ans. 34 – 36 of test paper 2

34. A 35. B

36. B
Nitin - Ravi = Ravi - Lokesh
Nitin + Lokesh = 2 (Ravi)
So, 24 = 2 (Ravi = Ravi = 12 years.)

37. B 38. A

39. C

For Ans (39-40)

\[ \Phi \quad \beta \quad $ \quad ¥ \quad £ \quad \varepsilon \quad \gamma \]

40. A
We can express the integers along a line. Please note that the farther the integers are along the line, the greater is their difference. Thus the information can be plotted as follows.

41. E
For another additional integer \( \Sigma \), \( \Sigma > \gamma \) or \( \Phi > \Sigma \), but \( \Sigma \) cannot be less than \( \beta \) and greater than \( \gamma \) at the same time. Thus (E) is false.

42. E
43. C
44. D
45. D
3 3 9 = 2 pairs
9 3 9 = 2 pairs
4 pairs
+ 2 pairs
= 6 pairs

46. B
For Ans 47-50

47. A

\[ \begin{align*}
3 & \quad 3 \quad 9 = 2 \text{ pairs} \\
9 & \quad 3 \quad 9 = 2 \text{ pairs} \\
& \quad 4 \text{ pairs} \\
& \quad + 2 \text{ pairs} \\
& \quad = 6 \text{ pairs}
\end{align*} \]
49. B

50. E

— People who can work on Monday: Neeraj, Rohit, Raveesh and Lokesh.
— People who can work on Tuesday: Neeraj, Raveesh, Manoj and Lokesh
— People who can work on Wednesday: Neeraj, Rohit, Raveesh and Manoj
— People who can work on Thursday: Rohit, Raveesh, Lokesh and Manoj
— People who can work on Friday: Neeraj, Rohit, Manoj and Lokesh

TEST PAPER – 4

Immediate Inference

1. Statements: All diamonds are stones.
   No stone is glass.
   Conclusions
   1. No diamond is glass.
   2. No glass is a stone.
2. Statements: All fish are hens.
   All hens are boys.
   Conclusions
   1. All fish are boys.
   2. All hens are fish.

Syllogism

3. Statements: All cards are notes.
   No note is a page.
   Conclusions
   1. Some cards are pages.
   2. Some pages are notes.
4. **Statements**: All players are females.
   
   No female is smart.
   
   **Conclusions**
   
   1. No player is smart.
   2. No male is in the team.

5. **Statements**: Some cows are cars.
   
   ‘X’ is a cow.
   
   **Conclusions**
   
   1. ‘X’ is not a cow.
   2. Some cars are not cows.

6. **Statements**: All doors are floors.
   
   No floor is a window
   
   **Conclusions**
   
   1. No door is a window.
   2. No window is a door.

7. **Statements**: Some rivers are seas.
   
   All seas are skies.
   
   **Conclusions**
   
   1. All skies are seas.
   2. Some rivers are skies.

8. **Statements**: All fathers are sons.
   
   All sons are grand-fathers.
   
   **Conclusions**
   
   1. All grand-fathers are fathers.
   2. All fathers are grand-fathers.

**Assumptions and Conclusions**

9. **Assumption**
   
   (i) lions eat salt.
(ii) salt is used in cooking food.

**Conclusion**

So, lions can cook their food.

**Logical Diagrams**

**Questions (10-16)**

10. Queens, Royal family members, Administrators.
12. People, Men, Football players.
13. Land animals, Tigers, Eagles
14. Stars, Earth, Sun
15. Man-made objects, Knives, Stainless steel objects
16. Teachers, Males, Athletes

**Questions 17-26**
Logical Deductions

27. **Statements:** Some tins are round.
   
   (A) Some cups are round.

**Conclusions**

   I. Some tins are cups.
   II. All round things are either tins or cups.
   III. Some tins are rectangular.
   IV. Some cups are flat.
   
   (a) Only I follows.
   (b) Only III and IV follow.
   (c) None of the conclusions follow.
   (d) All the conclusions follow.

28. **Statements:** (A) All rivers are mountains.
    (B) All forests are mountains.

**Conclusions**

   I. Some rivers are forests.
II. Every mountain is either river or forest.

III. All mountains are rivers as well as forests.

IV. No forest is river.

(a) None follows.

(b) All follow.

(c) Either I or IV follows.

(d) Only II follows.

29. **Statements**: (A) All letters are box files.

(B) All box files are challans.

**Conclusions**

I. All letters are challans.

II. All challans are letters.

III. Some challans are letters.

IV. All box files are letters.

(a) Only I & III follow.

(b) Only I & II follow.

(c) None of the conclusions follow.

(d) All the conclusions follow.

**Analysis of Statements**

30. **Statement**: Should higher education be made free?

**Arguments**

X. Yes, it will help those who cannot afford it at present.

Y. No, it will give rise to unemployment only.

31. **Statement**: Should India make an atom bomb?

**Arguments**

X. Yes, it will prevent the enemies from taking initiatives.

Y. No, it is against the commitment made by India to use nuclear power for peaceful purposes.
32. **Statement**: Should India make an atom bomb?

**Arguments**

X. Yes, even Pakistan has made one.

Y. No, there is no possibility of India indulging in nuclear war.

**Family/ Blood Relation Qualms**

*Questions 33-35:*

Mr. and Mrs. Sharma have two children Asha and Shashi. Shashi married Radha, daughter of Mrs. Mahajan. Suresh, son of Mrs. Mahajan married Rita. Sonu and Rocky are born to Suresh and Rita. Uma and Sudha are the daughters of Shashi and Radha.

33. What is Sudha’s relation to Asha?

(A) Sister  (B) Niece  (C) Aunt  (D) Daughter  (E) None

34. How is Sonu related to Mr. Mahajan?

(A) Son-in-law (B) Son  (C) Grandson  (D) None of these  
(E) Cannot be determined

35. How is Asha related to Radha?

(A) Mother-in-law  (B) Aunt  (C) Sister-in-law  
(D) Niece  (E) None of the above

**Age Doubts**

36. Average of ages of Eva and Meena is 12 years and average age of Meena, Teena and Zareena comes out to be 48. The total age of the four girls would be?

(A) 140  (B) 60  (C) 84  (D) 72  
(E) Cannot be determined

37. In a class of 20 students, the average age of 16 years is reduced by 2 years if Mohan joins in, can you calculate Mohan's age? If yes, then find out.
38. Treeza is as much younger to Eveline as she is older to Eyeline. If the sum of the ages of Eveline and Eyeline is 80 years, how old is Treeza?
(A) 64  (B) 46  (C) 32  (D) 48  (E) 40

39. The ratio of grandfather's age and grandson's age is 8:3. If the product of their ages is 120 years, how old is the grandson?
(A) 18  (B) 12  (C) 15  (D) 9  (E) 8

### Arrangement of Letters/Alphabets/Numbers

40. Study the following sequence of numbers.
8 9 6 7 3 9 3 7 8 3 9 9 5 6 3 9 6 9 3 9 8

Which digit is exactly in the middle in the above set of numbers?
(a) 8  (b) 3  (c) 9  (d) 5  (e) None

**Directions:** The following questions (41-43) are based on the given sequence of numbers
6 9 6 9 6 6 7 6 9 7 9 6 6 9 7 9 6 6 7

41. How many 9's are sandwiched between 6 and 7?
(a) 2  (b) 3  (c) 4  (d) 1  (e) None

42. How many 6's are sandwiched between 9's?
(a) 1  (b) 2  (c) 3  (d) 4  (e) None

43. How many 7's have a 6 before and after?
(a) 1  (b) 2  (c) 3  (d) 4  (e) None

### Arrangement Problems

**Directions (Questions 44-46):** If the first six letters of the word
THOUGHTFULNESS
are reversed, the next six letters are written as they are and then remaining letters are reversed.

44. Which letter will be exactly in the middle?
45. Which two letters will be sandwiched between double T and double L?
   (a) NS  (b) FE  (c) FU  (d) HT  (e) None

46. If all vowels are removed which letter will be exactly in the middle?
   (a) T  (b) L  (c) F  (d) H  (e) None

**Transaction Analysis**

*Directions (Questions 47-49):* Study the following statements and answer the questions that follow.

(i) Bengalis and Tamils are politicians, poets and warriors.
(ii) Tamils and Punjabis are politicians, warriors and mathematicians.
(iii) Punjabis and Gujarati's are politicians, businessmen and mathematicians.
(iv) Gujaratis and Kashmiris are businessmen, poets and mathematicians.
(v) Bengalis and Kashmiris are businessmen, poets and warriors.

47. The people who are politicians, poets, warriors and mathematicians?
   (a) Bengalis  (c) Punjabis  (b) Tamils  (d) Gujaratis

48. The people who are politicians, businessmen, warriors and mathematicians?
   (a) Bengalis  (c) Punjabis  (e) Kashmiris  (b) Tamils  (d) Gujaratis

49. The people who are businessmen, poets, warriors and mathematicians?
   (a) Bengalis  (c) Punjabis  (e) Kashmiris  (b) Tamils  (d) Gujaratis

50. Five Friends Lokesh, Manoj, Gopal, Raveesh and Rohit have agreed to work together on a part-time job offered by a local restaurant. The restaurant opens five days a week and these five have the following schedules when they can work.
   (i) Neeraj and Raveesh can work on Monday, Tuesday and Wednesday.
   (ii) Raveesh and Rohit can work on Monday, Wednesday and Thursday
   (iii) Rohit and Lokesh can work on Monday, Friday and Thursday
   (iv) Lokesh and Manoj can work on Friday, Tuesday and Thursday.
(v) Neeraj and Manoj can work on Friday, Tuesday and Wednesday.

Name the person who cannot work on Wednesday

(a) Neeraj (b) Raveesh (c) Rohit (d) Lokesh (e) Manoj

Answers and Explanations (TEST PAPER - 4)

1. E \( A + E = E \), also statement (2) can be converted to conclusion (2).
2. A \( A + A = A \), thus conclusion (1) follows.
3. D
4. A
5. B
6. E
7. B
8. B
9. C None of the assumptions is a relational assumption.
10. A
11. E
12. D
13. C
14. C
15. D
16. B
17. E
18. D
19. C
20. E
21. E
22. D
23. A
24. B
25. A
26. C
27. C

Fig for Ans 33-35
36. E
37. D \((20 \times 16 - 21 \times 14) = 26 \text{ years}\)
38. E
39. C \((8A \times 3A = 120) \Rightarrow 24A = 120 \text{ or } A = 5 \text{ years}\)
Therefore, grandson must be \(3 \times 5 = 15 \text{ years}\)
40. C
41. C
42. C
43. A
44. B \(HGUOHTTFUL ESSSENS\)
45. C \(HGUOHTTFUL ESSSENS\)
46. E \(GHHTTFLSSSNS\)
47. B
48. C
49. E
50. D