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# UNIT 4 "SCIENCE AND HUMAN LIFE"

## by BERTRAND RUSSEL

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## 4.0 OBJECTIVES

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In this unit we shall give you further practice in reading comprehension by

- i) giving you an expository passage: 'Science and Human Life by Bertrand Russell, and
- ii) giving a glossary of difficult words and questions on comprehension.

We shall also set an exercise on selected items of vocabulary. In the section on grammar and usage we shall discuss the passive constructions, non-finite verbals, and modal auxiliaries. We shall also ask you to write short compositions based on the passage read by you, and give you practice in conversation and pronunciation.

After completing the unit you should be able to

- read and understand expository passages;
- use the passive constructions correctly;
- use non-finite verbals, gerunds and participles;
- use modal auxiliaries correctly;
- write short expository compositions;
- describe people;
- express agreement and disagreement;
- pronounce /r/, /v/, /w/ correctly.

## 4.1 READING COMPREHENSION

### 4.1.1 Passage for Reading

#### Science and Human Life

by Bertrand Russell

1. Science and the techniques to which it has given rise have changed human life during the last hundred and fifty years more than it had been changed since men took to agriculture, and the changes that are being wrought by science continue at an increasing speed. There is no sign of any new stability to be attained on some scientific plateau. On the contrary, there is every reason to think that the revolutionary possibilities of science extend immeasurably beyond what has so far been realised. Can the human race adjust itself quickly enough to these vertiginous transformations, or will it, as innumerable former species have done, perish from lack of adaptability? The dinosaurs were, in their day, the lords of creation, and if there had been philosophers among them, not one would have foreseen that the whole race might perish. But they became extinct because they could not adapt themselves to a world without swamps. In the case of man and science there is a wholly new factor, namely that man himself is creating the changes of environment to which he will have to adjust himself with unprecedented rapidity. But, although man through his scientific skill is the cause of the changes of environment, most of these changes are not willed by human beings. Although they come about through human agencies, they have, or at any rate have had so far, something of the inexorable inevitability of natural forces. Whether Nature dried up the swamps or men deliberately drained them, makes little difference as regards the ultimate result. Whether men will be able to survive the changes of environment that their own skill has brought about is an open question. If the answer is in the affirmative, it will be known some day; if not, not. If the answer is to be in the affirmative, men will have to apply scientific ways of thinking to themselves and their institutions.
2. One of the most obvious problems raised by a scientific technique is that of the exhaustion of the soil and of raw materials. This subject has been much discussed and some governments have actually taken some steps to prevent the denudation of the soil. But I doubt whether, as yet, the good done by these measures is outweighing the harm done in less careful regions. Food, however, is such an obvious necessity that the problem is bound to receive increasing attention as population pressure makes it more urgent. Whether this increased attention will do good or harm in the long run is, I fear, questionable. By a spendthrift use of fertilisers, food production in the present can be increased at the cost of food production in the future.
3. The question of raw materials is more difficult and complex than the question of food. The raw materials required at one stage of technique are different from those required at another. It may be that by the time the world's supply of oil is exhausted atomic power will have taken its place. But to this sort of process there is a limit, though not an easily assignable one. At present there is a race for uranium, and it would seem likely that before very long there will be no easily accessible source of uranium. If, when that happens, the world has come to depend upon nuclear energy as its main source of power, the result may be devastating. All such speculations are of course very questionable, since new techniques may always make it possible to dispense with formerly necessary raw materials. But we cannot get away from the broad fact that we are living upon the world's capital of stored energy and are transforming the energy at a continually increasing rate into forms in which it cannot be utilised. Such a manner of life can hardly be stable, but must sooner or later bring the penalty that lies in wait for those who live on capital.
4. In primitive times, when the human population of the globe was small, such problems did not arise. Agriculture, it is true, was practised in ways that exhausted the soil for a time, but there were usually new vacant lands available; and if there were not, the corpses of enemies sufficed as fertilisers. The system was 'conservative' in the physicists' sense. That is to say, energy on the whole accumulated as fast as it was used. Now, this is not the case; and, so far as one can see, it will never be the case while scientific technique continues.
5. The problems which most preoccupies the public mind at the present moment is that of scientific warfare. It has become evident that, if scientific skill is allowed free scope, the human race will be exterminated, if not in the next war, then in the next but one or the next but two—at any rate at no very distant date. To this problem there are two possible reactions: there are those who say, 'Let us create social institutions which will make large-scale war impossible; there are others who say, 'Let us not allow war to become too scientific. We cannot perhaps go back to bows and arrows, but let

us at any rate agree with our enemies that, if we fight them, both sides will fight inefficiently. 'For my part, I favour the former answer, since I cannot see that either side could be expected to observe an agreement not to use modern weapons if once war had broken out. It is on this ground that I do not think that there will long continue to be human beings unless methods are found of permanently preventing large-scale wars. I shall return to it presently.

6. The new dangers resulting from our more organic society call for certain changes in the kind of character that is admired. The bold buccanier, or the great conqueror such as Alexander or Napoleon, has been admired and is still admired although the world can no longer afford this type of character. We come here upon a difficulty. It is a good thing that people should be adventurous and that there should be scope for individual enterprise; but the adventure and enterprise, if they are not to bring total disaster, must steer clear of certain fields in which they were formerly possible. You can still, without harm to your fellow men, wish to be the first man to reach the moon. You may wish to be a great poet or a great composer or a man who advances the boundaries of scientific knowledge. Such adventure injures no one. But if Napoleon is your ideal, you must be restrained. Certain kinds of anarchic self-assertion, which are splendid in the literature of tragedy, have come to involve too much risk. A motorist alone on an empty road may drive as he pleases, but in crowded traffic he must obey the rules. More and more the lives of individuals come to resemble the motorist in traffic rather than the lonely driver in an empty desert.
7. Come at last to a question which is causing considerable concern and perplexity to many men of science, namely; what is their social duty towards this new world that they have been creating? I do not think this question is easy or simple. The pure man of science, as such, is concerned with the advancement of knowledge, and in his professional moments he takes it for granted that the advancement of knowledge is desirable. But inevitably he finds himself casting his pearls before swine. Men who do not understand his scientific work can utilise the knowledge that he provides. The new techniques to which it gives rise often have totally unexpected effects. The men who decide what use shall be made of the new techniques are not necessarily possessed of any exceptional degree of wisdom. They are mainly politicians whose professional skill consists in knowing how to play upon the emotions of masses of men. The emotions which easily sway masses are very seldom the best of which the individuals composing the masses are capable. And so the scientist finds that he has unintentionally placed new powers in the hands of reckless men. He may easily come to doubt, in moments of depression or overwork, whether the world would not be a happier place if science did not exist. He knows that science gives power and that the power which it gives could be used to increase human welfare; but he knows also that very often it is used, not so, but in the very opposite direction.
8. We must retain the belief that scientific knowledge is one of the glories of man. I will not maintain that knowledge can never do harm. I think such general propositions can almost always be refused by well-chosen examples. What I will maintain--and maintain vigorously--is that knowledge is very much more often useful than harmful and that fear of knowledge is very much more often harmful than useful. Suppose you are a scientific pioneer and you make some discovery of great scientific importance, and suppose you say to yourself. 'I am afraid that discovery will do harm'; you know that other people are likely to make the same discovery if they are allowed suitable opportunities for research; you must therefore, if you do not wish the discovery to become public, either discourage your sort of research or control publication by a board of censors. Nine times out of ten, the board of censors will object to knowledge that is in fact useful e.g., knowledge concerning birth control--rather than to knowledge that would in fact be harmful. It is very difficult to foresee the social effects of new knowledge, and it is very easy from the sheer force of habit to shrink from new knowledge such as might promote new kinds of behaviour.
9. Apart from the more general duties of scientists towards society, they have a quite special and exceptional role in the present critical condition of the world. All men of science who have studied thermonuclear warfare are aware of two superlatively important facts. first that whatever agreements may have been reached to the contrary, thermonuclear weapons will certainly be employed by both sides in a world war; second that if such weapons are employed there can be no hope of victory for either side, but only of universal destruction involving, quite possibly, the end of all human and animal life and almost certainly, failing that, a complete reversion to barbarism.

#### 4.1.2 Note on the Author

Bertrand (Arthur William) Russell (1872-1970) was an English philosopher and mathematician. He was awarded the Nobel Prize for Literature in 1950.

### 4.1.3 Glossary

1. **tech'niques** : methods  
**wrought** : made  
**sta'bility** : the state of being steady  
**'plateau** : a period of time during which the active development of something is not continued  
**ver'tiginous** : causing a feeling of great unsteadiness  
**'transfor'mation** : complete change  
**'species** : a group of plants or animals that are of the same kind, which are alike in all important ways  
**a,dapta'bility** : ability to change so as to be suitable for different conditions  
**'dinosaurs** : types of very large long-tailed creatures that lived in very ancient times  
**cre'ation** : the universe, the world, and all living things  
**ex'tinct** : no longer existing  
**swamp/swamp/** : soft, wet land  
**en'vironment** : the surrounding conditions  
**un'precedented** : which has never happened before  
**willed** : made by power of the mind  
**'agency** : the power which causes a result  
**in 'exorable** : whose actions or effects cannot be prevented  
**i, nevita'bility** : something that cannot be prevented from happening  
**'natural** : what happens ordinarily in the world, not caused by people  
**de'liberately** : intentionally  
**'ultimate** : happening in the end  
**af'firmative** : declaring 'yes'  
**insti'tutions** : habits and customs which have been in existence for a long time:organisations
2. **ex'haustion** : the state of being used up completely  
**raw** : in the natural state, not yet treated for use  
**denu'dation** : removal of the covering  
**out'weighing** : being more important than  
**'obvious** : easy to understand: clear  
**bound** : certain  
**'urgent** : very important; which must be dealt with quickly  
**'questionable** : not certain  
**'spend thrift** : spending wastefully  
**'fertilisers** : chemical or natural substances that are put on the land to make crops grow better
3. **'complex** : difficult to understand  
**ex'hausted** : used up completely  
**'process** : a continued set of actions to reach some result  
**as'signable** : which can be fixed  
**u'ranium** : a heavy white metal that is an element (= a simple substance),is radio-active, and is used in the production of atomic power  
**ac'cessible** : easy to get at  
**'devastating** : completely destructive  
**specu'lation** : reasoning without all the facts  
**'questionable** : about which doubts may be raised  
**di'spense with** : do without
4. **'primitive** : of the earliest stage of the development of man  
**globe** : an object in the shape of a round ball; the earth  
**'corpses** : dead bodies  
**con'servative** : preserving: using carefully

- 'physicist** : a person who makes a special study of physics, the science concerned with matter and natural forces
- ac'cumulated** : collected
5. **pre'occupies** : fills the thoughts of
- 'evident** : plain; clear
- ex'terminated** : killed
- re'action** : action in reply
6. **or'ganic** : made of parts with specialized purposes
- bucca'neer** : a sea-robber
- ad'venturous** : eager for exciting and dangerous experience: ready to take risks
- 'enterprise** : the way of arranging and carrying on business
- dis'saster** : sudden great misfortune
- 'steer' clear of** : keep away from
- re'strained** : controlled
- a'narchic** : without control
7. **casting pearls before swine** : offering something valuable to someone who cannot understand how valuable it is
- sway** : influence
- 'reckless** : too hasty; not caring about danger
8. **propo'sition** : an unproved statement in which an opinion is expressed
- re'futed** : proved to be untrue
- 'vigorously** : forcefully
- pio'neer** : a person who does something first and so prepares the way for others
- 'censor** : an official who examines printed matter, etc. with the power to remove anything offensive
9. **thermo'nuclear** : using the very high temperatures that result from atomic fusion as in a hydrogen bomb
- re'version (n)** : return to a former condition
- 'barbarism** : the state of being uncivilized

#### 4.1.4 Comprehension Questions

##### Exercise 1

(Find the answers to these questions in the section marked with the corresponding numbers)

1. Science has brought about a rapid change in human life. What question does it give rise to?  
.....  
.....
2. a) The author refers to one of the problems raised by scientific technique. What is it?  
b) How can food production be increased? What effect will it have in the future. Why do you think so?  
.....  
.....
3. a) What will be a possible substitute if the world's supply of oil is exhausted?  
.....  
.....  
b) Man will be punished for living on 'capital'. What capital is the author talking about?  
.....  
.....

4. In older days the problem relating to the exhaustion of the sources of energy did not arise. Why?
- .....
- .....
5. Man dreads the next war. What are the two possible reactions to this? Why is the second alternative not a practical one?
- .....
- .....
- .....
- .....
6. a) Name two people who are greatly admired. Why is it dangerous to admire them?
- .....
- .....
- b) What type of aspiration injures no one?
- .....
- .....
7. What is the ambition of a pure man of science?
- .....
- .....
8. What does science give?
- .....
- .....
- Is it always used in that way?
- .....
9. What is the greatest danger of thermonuclear warfare?
- .....
- .....
- .....
- .....
- .....

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## 4.2 VOCABULARY

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### Exercise 2

- a) Match words of List A with words of similar meaning given in List B.

A  
perish  
environment  
obvious  
spendthrift  
utilize  
Accumulate

B  
surroundings  
apparent  
use  
extravagant  
store  
die

b) Now use suitable words from List A in the blanks below:

1. It is so hot that the green vegetables in the shop will \_\_\_\_\_ by evening
2. The patient is looking active and cheerful. It is \_\_\_\_\_ he has got rid of his stomach infection.
3. The young boy spent money recklessly, so his father reprimanded him on his being a \_\_\_\_\_.
4. To overcome drought conditions, Government will \_\_\_\_\_ all water resources
5. Even if you \_\_\_\_\_ a lot of money, it is not necessary that you will be happy.
6. Pollution of the \_\_\_\_\_ is hazardous for health.

## 4.3 GRAMMAR AND USAGE

### 4.3.1 The Passive Voice

Look at the following examples of the 'passive voice' taken from the reading passage (Section 19.1.1) with the simple present and the simple past tenses

(am/is/are/were + past participle)

1. Energy accumulated as fast as it was used. If scientific skill is allowed free scope.....
2. With the present continuous tense (is/are + being + past participle) changes that are being wrought.....
3. With the present perfect tense (has + been + past participle) ...beyond what has so far been realised.  
This subject has been much discussed.  
The great conqueror has been admired.
4. with the future tense (will + be + past participle)  
The answer will be known some day.  
The human race will be exterminated.
5. with modal verbs (can/must + be + past participle)  
Food production can be increased.  
You must be restrained

Notice that in all passive constructions we have the past participle form of the main verb preceded by the appropriate tense form of the verb be.

The passive voice is used when we are more interested in the action than in the 'doer' of the action.

#### Example

He was killed in a fight.

(We have not said who killed him.)

When the 'doer' is to be mentioned, we use a phrase beginning with by.

### Example

The meeting was addressed by the Prime Minister.

The passive voice is used very often to describe scientific experiments, because there the doer is not important. Similarly, we use the passive in the description of processes and the narration of historical events.

### Examples

Glass is made from sand, which *is melted* under great heat.

The First Battle of Panipat *was fought* in 1526

### Exercise 3

Fill in the blanks with passive forms of the verbs given in brackets:

- a) Great quantities of animal oil come from whales. To protect the whale from the cold of the Arctic seas, nature has provided it with a thick covering of fat called blubber. When the whale \_\_\_\_\_ (kill), the blubber \_\_\_\_\_ (strip) off and boiled down. It produces a great quantity of oil which \_\_\_\_\_ (can make) into food. Vegetable oil \_\_\_\_\_ (know) from very old times. No household can get on without it, for it \_\_\_\_\_ (use) in cooking. Perfumes \_\_\_\_\_ (may make) from the oils of certain flowers. Soaps \_\_\_\_\_ (make) from vegetable and animal oil. Scientists think that the oil under the surface of the earth originated from living things in the seas. For these creatures to become oil, it was necessary that they \_\_\_\_\_ (should imprison) between layers of rock for an enormous length of time. The statement that oil originated in the sea \_\_\_\_\_ (confirm) by a glance at the map showing the chief oil fields of the world; very few of them are far distant from the oceans of today. The rocks in which oil \_\_\_\_\_ (find) are of sea origin

### 4.3.2 Non-finite Verbals

A finite verb changes its form according to tense and the number and the number and person of the subject. For example, the verb 'be' has the finite forms am, is, are, was, were, and the non-finite forms *being* and *been*

The form of the verb that can be used after other verbs and with *to* before it (such as go in I can go, I want to go, and *It is important to go, think in there is every reason to think so* is called the infinitive.

### Exercise 4

Insert *to*, where necessary, before the verbs in brackets.

1. Do you know how (repair) a watch?  
Yes, I do, but my mother wouldn't let me (touch) hers.
2. Why did you make us (wait) for so long outside?
3. I am sorry (inform) you that the company finds itself unable (let) you (file) your complaint at the end of the year.
4. If you are not careful. I'll make you (do) it all over again.
5. Would you like (join) the army?
6. He seems (know) the whole area
7. He tried very hard (make) me (believe) that he sincerely wanted me (learn) how (swim)
8. Please tell me where (keep) this vase in the drawing room
9. Is it necessary for me (attend) the meeting? I'd much rather (stay) at home.
10. It is up to you (accept) or (reject) this offer, unless you want me (tell) you why you should accept it.



### Exercise 5

Combine each of the following pairs of sentences into one sentence using the pattern too.....to-infinitive', as in the examples

Examples: It is very cold. We can't go out.  
It is too cold to go out.  
He is very tired. He can't work.  
He is too tired to work

Let us not allow war to become too scientific (para 5) means that if we use too many scientific weapons in war it will destroy civilisation completely. Remember too tired to work means so tired that he can't work'.

1. He is very young. He won't understand this story.

.....

2. He was quite angry. He couldn't speak.

.....

3. It was very dark. I didn't see the signpost clearly

.....

4. He is very timid. He can't get married

.....

5. He is very busy. He won't see you now.

.....

### Exercise 6

Replace the italicized words by a phrase with to-infinitive.

Example:

It is necessary *that we should do* something

It is necessary for us to do something

He was the first person *who congratulated me* on my birthday

He was.....to congratulate me.....

1. There was no place where we could hide.

.....

.....

2. It is necessary that people should know the truth.

.....

.....

3. It is better that he should receive it from his father.

.....

.....

4. I was surprised when I heard that he had left the party

.....

.....

5. I was the only one who recognised him in the dark

.....  
.....

### The Infinitive of Purpose

Read the following sentence:

People dig up clay to make bricks, and another sort of clay to make earthenware and china.

- a) We use 'to + infinitive' to talk about the purpose of doing something (that is, why someone does something):
- i) Badrinath went out to buy stamps.  
(because he wanted to buy stamps)
  - ii) My friend shouted 'Look out!' to warn me of the speeding bus.
- b) We also use 'to + infinitive' to talk about the purpose of something, or why someone has/wants/needs something:
- i) This fence is to keep stray animals out of the garden
  - ii) The Prime Minister has a number of body-guards to protect him
  - iii) We need a match to light this stove.

### Exercise 7

Answer these question in complete sentence, using the words given in brackets.

#### Example:

Why did Kusum phone you? (invite me to her birthday party)  
She phoned to invite me to her birthday party

1. Why did Azhar go to the bank? (cash a cheque)

.....  
.....

2. Why are you going to Paris? (learn French)

.....  
.....

3. Why does Srinivas need a bag? (put these vegetables in)

.....  
.....

4. Why has Jayant gone to the police station? (report that his bicycle has been stolen)

.....  
.....

5. Why do the Reddys want a bank loan? (buy a house)

.....  
.....

6. Why are you going to the post office? (send a money order)

.....  
.....

7. Why did Susheela go to the chemist? (get some medicine)

.....

.....

8. Why does Mr. Sharma have a Secretary? (type his letters)

.....

.....

9. Why did the Minister want an aircraft? (take him to the site of accident)

.....

.....

10. Why are you going into hospital? (have an operation)

.....

.....

### 4.3.3 Gerunds

A gerund is a verbal noun, that is, a noun which describes an action or experience and has the form of a present participle (the -ing form)

**Example :**

"thinking" in the sentence "Men will have to apply scientific ways of thinking to themselves and their institutions".

#### Exercise 8

Rewrite the following by adding -ing to the verbs in brackets:

1. He gave up (smoke) a long time ago

.....

2. I don't feel like (work) after lunch; I prefer (sleep)

.....

3. Who enjoys (go) to hospital?

Patients, of course

.....

.....

4. Is it worth (bother) about?

.....

5. (See) is (believe).

.....

6. Why did he go to prison?

He was accused of (pass) secret information to the enemy.

.....

7. (Smoke) is not allowed inside the hall

.....

8. You can't make an omelette without (break) eggs.

9. Try to avoid (make) a noise

10. Aren't you looking forward to (meet) your family after so many months?

### Exercise 9

Change the verbs in brackets by adding -ing or inserting to, whichever is appropriate, as in the examples

#### Examples:

- i) You still have a lot (learn), if you'll forgive my (say)so,  
You still have a lot to learn, if you'll forgive my saying so,
- ii) Would you' mind (come) with me to Mohan's house: I wish (congratuiate) him on his (win) an  
award in the Quiz Contest.  
Would you mind coming with me to Mohan's house; I wish to congratulate him on his winning an  
award in the Quiz Contest.

1. You'll never regret (help) a friend in need.

2. The doctor asked him (leave) the room without (give) him a chance (say) what his problem was.

3. Your hair wants (cut); why don't you find time (go) to the barber?

4. Fancy (have) (work) for a crazy person like him; I'd rather be without a job.

5. The doctor advised him (stop) (drink)

6. He grew a beard (avoid) (be) recognised by the police

7. Don't forget (switch) off the light before (go) to bed.

8. Yesterday I was fined for (exceed) the speed limit; the constable said it was (make) me remember  
the rule for ever.

### 4.3.4 Participles

Participles are the two forms of a verb (called present participle and past participle) which may be used in compound forms of the verb or as adjectives.

#### Examples:

Why are we going there?

(present participle used to form present continuous tense)

The problems can also be considered.

(past participle used to form the passive voice)

a loving mother (present participle used as an adjective)

He had a worried look.

(past participle used as an adjective)

Science and the techniques to which it has given rise have changed human life. (para 1 of the passage *given* and *changed* are in the past participle form used here for the present perfect tense.

I cannot see that either side could be expected to observe an agreement not to use modern weapons if once war had broken out. In the sentence above *broken* is in the past participle form used for the past perfect tense.

### Exercise 10

Fill in the blanks in the following sentences using the verbs given below. Add -ing to each verb before using it.

revolve, smile, slide, nag, move

1. We need a \_\_\_\_\_ door here
2. He had a serious accident while getting off a \_\_\_\_\_ bus .
3. A \_\_\_\_\_ chair is better than an ordinary one, but it is much more expensive.
4. It is as uncommon for a peevish person to have a \_\_\_\_\_ face as it is for a cheerful person to have a peevish one.
5. His wife is always complaining about something. No wonder people call him the husband of a \_\_\_\_\_ wife.

### Exercise 11

Fill in the blanks in the sentences below with the following verbs in the correct form.

1. Before he left for the tour, he \_\_\_\_\_ (take) trouble to arrange for all that would be needed.
2. They \_\_\_\_\_ (complete) the construction of the house when we arrived.
3. I \_\_\_\_\_ not yet \_\_\_\_\_ (arrive) at a solution to the problem.
4. \_\_\_\_\_ he \_\_\_\_\_ (write) the letter to his secretary?
5. The wind \_\_\_\_\_ (blow) all the dried leaves to one side of the road.

## 4.3.5 Modal Auxiliaries

There are some special verbs in English which are called modal auxiliaries, Some of these are: can, may, must, ought to, should, would.

**can**

can has number of uses

e.g.

Can the human race adjust itself quickly enough to these

vertiginous transformations.....? (para 1)

it means, know how to' be able to.

**Examples.**

I can swim well

I couldn't do that new job, it was too difficult.

(meaning 'I wasn't able to do it)

I can see you easily from here.  
Let's go where we can have some freedom  
Money cannot buy everything

- ii) It can also mean be allowed to, (by rules);  
e.g. You can't pick the ball up in football.  
(The rules do not allow this)
- ii) It is also used in the sense of 'have permission to: e.g.,  
Can we go to the shops for sweets

### May

may is used in the following senses:

- i) It can mean 'be likely to' (possibility)

Examples:

He may come or he may not.

He may have been hurt

- ii) It can also mean 'have permission to, allowed to'.  
May I come in?
- iii) If when that happens, the world has come to depend upon nuclear energy as its main source of power, the result may be devastating (para 3 of the passage). (possibility)
- iv) A motorist alone on an empty road may drive as he pleases, but in crowded traffic he must obey the rules. ('allowed to')

### Exercise 12

Fill in the blanks with *may* or *can* in the following sentences:

- 1) You \_\_\_\_\_ not think so, but dirty streets \_\_\_\_\_ cause epidemics
- 2) With a little effort you and your wife \_\_\_\_\_ keep the house clean
- 3) Rubbish should be put in the dustbin so that it \_\_\_\_\_ be removed by cleaners every day.
- 4) Look at the dark clouds: it \_\_\_\_\_ rain tonight
- 5) "\_\_\_\_\_ you stand on your head"?
- 6) "How \_\_\_\_\_ I? I haven't learnt yoga." must; have to

Study the use of *must* and *have to* in the following sentence :  
You must clean your own boots. (Those are my orders).

You have to clean your own boots when you join the army. (The rules oblige you to do that.)

Both *must* and *have to* are used to express an obligation. The main difference between the two is that *must* expresses obligation imposed by the speaker, while *have to* expresses an obligation imposed by external circumstances. The other important point to bear in mind is that *have to* is preferred for habits and *must* for an obligation that is urgent.

I have to water the plants myself.

I must inform him at once; he has got the job

You don't have to go to school on holidays

You must go to school today; it is the last day for paying the fees.

Note: *must* has no past or future form, Therefore, *had to* is used for the past and *will have to* for the future. Look at the following :

I *had* to stop the car; there was a bus in the middle of the road.  
John is retiring in 1990; he *will have to* look for a new job if he wants to continue his son's education.

From the passage :

In the case of man and science there is a wholly new factor, namely that man himself is creating the changes of environment to which he will have to adjust himself.

### Exercise 13

Fill in the blanks with *must* or *have to* in the following sentences:

- 1) I \_\_\_\_\_leave now; it is getting late.
- 2) I can never remember people's phone numbers; I always \_\_\_\_\_look them up.
- 3) You \_\_\_\_\_try to be a little more tactful
- 4) It isn't fair; I always \_\_\_\_\_do the dirty work.
- 5) If there is a problem, you \_\_\_\_\_report it to me at once.
- 6) I \_\_\_\_\_do all the drafting at my office; my colleagues are too lazy.
- 7) Tell him he \_\_\_\_\_be here by five; I insist on it.
- 8) My cook is old and blind, Whenever he wants to eat. I \_\_\_\_\_get up and cook for him
- 9) Notice in a department store: Bags and umbrellas \_\_\_\_\_be left at the desk.
- 10) You \_\_\_\_\_visit us again some time.

### ought to, should, and would

Study the use of *ought to*, *should* and *would* in the following sentence:

You *ought to* send more money to your old parents.  
(It's your duty)

You *ought to* have worked harder; I advised you to.  
(But you didn't and now it is too late.)

I think you *should* wear your glasses regularly.  
(It's my suggestion advice).

*Should* I go there by taxi? (asking for advice)  
It is a good thing that people *should be* adventurous and that there should be scope for individual enterprise. (What is right)

*Would* you please tell me the way to India Gate? (a request)  
I *would* like to see the manager. (more polite than 'I want to....')

If there had been a philosopher among them, not one would have foreseen that the whole race might perish.

The fact stated in the second clause depends on the existence of the fact in the first clause of the sentence i.e. existence of philosophers

*Ought to* is very often used when we wish to refer to the duty of the person referred to by the subject. The speaker is reminding this person of the duty, or giving him advice, *ought to* does not carry the speaker's authority (as *must* does) nor does it indicate an outside authority (as *have to* does). *Ought to* is usually said without much emphasis. *Should* can also be used in the same way as *ought*.

**Compare the following:**

You have to take this injection. (The doctor insists on it)

You musn't drink this; it is poison.

You ought not to smoke so much; you are wasting your money.

You have to obey Mr. Gill. (Mr. Gill insists on it.)

You must obey Mr. Gill. (The speaker insists on or approves of Mr.Gill's authority)

You ought to obey Mr. Gill (Neither the speaker's authority nor Mr.Gill's is involved here, but the speaker thinks that obeying Mr.Gill is advisable or part of the duty of the person addressed.)

**Note:** *ought to* with the perfect infinitive (e.g. *ought to have done*, *ought to have gone*) expresses a duty or a course of action that was neglected.

**Example :** You *ought to have applied* for the job last month. Now it is too late.

**Exercise 14**

Fill in the blanks with *ought to*, *have to* or *must* in the following paragraph:

I \_\_\_\_\_ have gone to see Mr. Sharma last week. He passed away this morning in hospital; they \_\_\_\_\_ bring the body home. I \_\_\_\_\_ go to the funeral; that will be making some amends. His three sons \_\_\_\_\_ be present before they remove the body to the cremation ground. His wife \_\_\_\_\_ stay in the house all by herself. *Should* can be used in the same way as *ought to*, but it is less forceful than *must* or *have to* because no authority is involved.

*Should* is generally used to express duty and to indicate a correct or sensible action. It is a useful way of giving advice. Look at the following:

You *should* pay your debts. (duty) you shouldn't tell lies. (correct action)

You *should eat* better to keep fit. (advice)

You have written it wrongly. There *should be* one more line at the end.(correct action)

They *shouldn't* allow parking in this street; it is too narrow.(advice)

**Exercise 15**

Rewrite the italicized parts of the following sentences, using *should* as in the example:

**Example :** He insisted *on my selling* the house.

He insisted that I should sell the house.

1) He suggested *our postponing the trip*.

.....

2) He was anxious *for everyone to have a chance to work*.

.....

3) He recommended *my buying a new car*.

.....

4) He agreed *to the two winners sharing the prize money*.

.....

5) He arranged *for me to receive higher education*.

.....



Study the use of *would* in the following sentences. Compare *would* with *want*.

I *want* some bananas.

I *would* like some bananas.

I *want* to see the manager.

I *would* like to see the manager, please  
*would like* is more polite than *want*.

*rather/sooner* is used after *would* to express preference.

He *would rather/sooner* talk himself than listen to others.

*Would* is also used for habits and insistence, and can be replaced by *used to*.

They *would* wait for us in the market every day. (used to wait).

She *would* visit her aunt though we warned her that she wasn't expected to. (insisted on visiting).

"Why don't you get your visa extended?"

"I've requested the officer several times to do it, but he *wouldn't*." (insisted on not doing)

### Exercise 16

Fill in the blanks with *would* or *should* in the following sentences

1. \_\_\_\_\_ you mind opening the window? It is too hot in here.
2. This jacket doesn't suit you: you \_\_\_\_\_ buy another
3. "The manager isn't in". "Then, I \_\_\_\_\_ like to see the assistant manager."
4. Perhaps you \_\_\_\_\_ be good enough to inform me of any change of programme before hand.
5. Why \_\_\_\_\_ women be paid less than men for doing the same work?
6. I \_\_\_\_\_ sooner die than compromise with a rogue like you.
7. He said he \_\_\_\_\_ be sorry to see the end of such lovely weather.
8. " Raj has failed the examination".  
"He \_\_\_\_\_ have worked harder".
9. I \_\_\_\_\_ have certainly come to your party if it had not been raining.
10. Why \_\_\_\_\_ I take all this trouble for nothing?

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## 4.4 WRITING

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### Exercise 17

Imagine you are one of the guests at a party where people are discussing whether life imprisonment is better than capital punishment. Write a couple of paragraphs (about 200 words) saying which point of view you would like to support. Mention (a) the problem, (b) its pros and cons and (c) your recommendations and suggestions.

OR

Write a short essay (200 words) on one of the following themes:

- a) The fewer man's material needs, the greater his freedom
- b) Life is full of strange happenings
- c) Wealth and happiness do not necessarily go together.

## 4.5 CONVERSATION

### 4.5.1 Describing People

#### Exercise 18

Read this dialogue between Mr. Roy and his young business partner, Mr. Sen. Mr. Sen has agreed to go to the airport to meet Mr. Roy's niece, Sujata, who is arriving from Calcutta, Mr. Sen has never met Sujata before and has to ask his partner for a good description of her, so that he doesn't make a mistake at the airport. Note that the description which Mr. Roy gives includes details of physical appearance and also information about what Sujata is wearing and carrying.

After you have read the dialogue, listen to it on the cassette. Then you can practise reading it aloud.

Mr. Sen: What's the flight number, did you say?

Mr. Roy: It's IC 304 arriving from Calcutta at 9.30. I hope the plane's on time.

Mr. Sen: Now tell me what she looks like, so I won't make any mistakes

Mr. Roy: Well she's fairly tall, and slim.

Mr. Sen: How tall?

Mr. Roy: Around 170 cms, I think

Mr. Sen: How old is she?

Mr. Roy: Pretty young, actually-in her early twenties

Mr. Sen: That's not much help, is it? There might be quite a few young women on that plane who are tall and slim. How would I recognize her?

Mr. Roy: You can't miss her. Few Indian women are that tall! Besides, she has the most fabulous smile. And extraordinarily large brown eyes that sparkle when she smiles.

Mr. Sen: (with a laugh) All right, then, if you say so. She sounds like a very friendly and confident person.

Mr. Roy: She is! Oh yes, and if this is of any help, she usually wears jeans when she travels. And shall probably carry her large brown suitcase with her.

Mr. Sen: Large brown eyes with a large brown suitcase, did you say? Fine, that certainly helps! I should be on my way now. See you later.

Mr. Roy: Don't forget to tell her why I couldn't come to the airport. I shall look forward to meeting her at lunch, of course.

### 4.5.2 Expressing Agreement and Disagreement

#### Exercise 19

Read the following dialogue and make a note of the different ways in which the speakers express agreement or disagreement with each other. You should then listen to the dialogue recorded on the cassette.

Arun : Hello, Sarat, Where have you been?

Sarat : To watch the third cricket test match between India and Pakistan.

Arun : But there's hardly any interest left in the match.  
It looks like it's going to be another draw.

- Sarat : Oh, you never know. Anything can happen in a game like cricket.
- Arun : Well, what do you think can happen?
- Sarat : Oh, the Indians can win, if they bowl the Pakistan is out for a low score
- Arun : I don't think they can. They haven't got good bowlers
- Sarat : You can't say that. Kapil Dev. Shastri, Binny, for example, can be very effective
- Arun : I agree, but I think India's bowling is not as strong as their batting
- Sarat : That's not the point. India's bowling may not be as strong as Pakistan's but it has been quite successful. The bowlers have already claimed four Pakistan wickets
- Arun : But surely that doesn't necessarily mean that it will be easy to get the remaining Pakistan batsmen out.
- Sarat : Well, I agree it may not be easy. But they have a fair chance if they continue to bowl as well as they did today.
- Arun : That again, I suppose, depends on chance.

Notice that the speakers use the expressions *don't think...you can't say that that's not the point*. But *surely..*to disagree with each other and they use the expression *I agree* to express agreement.

Now read the dialogue aloud after you have listened to it on the cassette.

#### Exercise 20

Your friend is of the opinion that watching television is bad for young children. You disagree with him/her. Write a short dialogue in which you disagree with your friend.

You think television is good for educating young children.

You can begin like this....

Your friend : I think young children shouldn't be allowed to watch television.

You : I don't agree. I think....

Your friend : You may be right, but some of the programmes are not meant for children at all.

You : I agree, But...

Now say the following pairs of words, making a clear distinction between /v/ and /w/.

You can also listen to them on the cassette.

/v/	/w/
vie	why
vest	west
vine	wine
vile	wile
verse	worse

### 4.5.3 Stress and Rhythm

#### Exercise 22

Say the following sentences with the correct stress patterns as shown. You can also listen to them on the cassette.

1. 'Where have you 'been?

2. But there's hardly any' interest 'left in the match.
3. It looks like its' going to be an'other 'draw
4. 'Anything can 'happen in a 'game like 'cricket.
5. 'What do you think 'can happen?

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## 4.6 LET US SUM UP

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In this unit we have given you for practice in

- reading and understanding an expository passage by Bertrand Russell
- using some of the words occurring in the story.
- using the passive voice correctly; and
- use non-finite verbals correctly
- use modal auxiliaries correctly
- dialogues in which you saw how we described people and how we could express our
- agreement or disagreement with other people.
- practice in the sounds /v/ and /w/ and patterns of stress and rhythm in sentences.

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## 4.7 KEY WORDS

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**No'bel 'Prize** ; any of several prizes given in Sweden each year for important work in science and literature and work towards world peace

**passive voice:** expressing an action which is done to the subject of the sentence e.g., the verb phrase was admitted in the sentence

He was admitted to the course is in the passive voice.

**'finite 'verb (in grammar)** : a verb changing according to tense and subject, e.g., the verb be has the finite forms *am, is, are, was, were* and the non-finite forms *being* and *been*.

**'gerund (in English grammar)**: a verbal noun, that is one which describes an action or experience and has the form of a present participle, e.g., *swimming* in the sentence:

Some people enjoy **swimming**.

**in 'finitive:** the form of the verb that can be used after other verbs and with *to* before it (e.g., *go* in *you can go*. *He wants to go*)

**'participle:** the present participle or the past participle form of a verb. Which may be used in compound forms of the verb or as an adjective.

**distri'bution (of a sound):** positions and words in which it occurs

**'larynx** : a cavity in the throat

**'rhythm (in English):** regular movement determined by the succession of accented and unaccented syllables in speech. The accented syllable in English occurs at roughly equal intervals of time.

**voice:** musical sound formed in the larynx

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## 4.8. SUGGESTED READINGS

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1. Bertrand Russell. **What is Science**, Victor Gollons
2. G.C. Thornily : **Easier Scientific English**, Longman

## 4.9 ANSWERS TO EXERCISES

### Exercise 1

1. The question is whether human beings will be able to adjust themselves to these rapid changes.
2. a) the exhaustion of the soil and of raw materials  
b) by the use of fertilizers. There will be less food production in the future. The fertility of the soil will be reduced.
3. a) Atomic power  
b) Stored energy in the form of raw materials.
4. a) The population was small, so there were very few farmers  
b) There was plenty of land. The soil did not get exhausted because the dead bodies of enemies served as fertilizers
5. One is that social institutions should be created which will make large-scale war impossible, and the other, that war should not be allowed to become too scientific. The second alternative is not practical because, if there is a war, each side will try to win by using deadly weapons
6. a) Alexander and Napoleon. It is dangerous to admire them because such people can bring about a disaster in the modern world  
b) The aspiration to be a great poet or a great composer or a great scientist.
7. a) The advancement of knowledge and wisdom
8. power; to increase human welfare

No

9. It might harm the human race; it will destroy all human and animal life. or at least bring about a complete reversion to barbarism.

### Exercise 2

- a) perish : die  
environment : surroundings  
obvious : apparent  
spendthrift : extravagant  
utilize : use  
accumulate : store
- b) 1. perish  
2. obvious  
3. spendthrift  
4. utilize  
5. accumulate  
6. environment

### Exercise 3

1. a) is killed, is stripped off, can be made, has been known, is used, may be made, are made, should be imprisoned, is confirmed, is found.

### Exercise 4

- |              |                               |                        |            |
|--------------|-------------------------------|------------------------|------------|
| 1) to repair | 2)                            | 3) to inform, to let   | 5) to join |
| 6) to know   | 7) to make, to learn, to swim |                        |            |
| 8) to keep   | 9) to attend                  | 10) to accept, to tell |            |

### Exercise 5

- 1) .....too young to understand
- 2) .....too angry to speak
- 3) .....too dark to see.....
- 4) .....too timid to get.....
- 5) .....too busy to see.....

### Exercise 6

- |                            |                                 |
|----------------------------|---------------------------------|
| 1) .....for us to hide     | 2) .....for people to know..... |
| 3) .....for him to receive | 4) .....to hear.....            |
| 5) .....to recognize ....  |                                 |

### Exercise 7

- 1) He went to the bank to cash a cheque.
- 2) I am going to Paris to learn French
- 3) Srinivas needs a bag to put these vegetables in.
- 4) Jayant has gone to the police station to report that his bicycle has been stolen.
- 5) The Reddys want a bank loan to buy a house.
- 6) I am going to the post office to send a money order
- 7) Susheela went to the chemist to get some medicine
- 8) Mr. Sharma has a secretary to type his letters.
- 9) The Minister wants an aircraft to take him to the site of the accident.
- 10) I am going into hospital to have an operation

### Exercise 8

- |              |                      |            |
|--------------|----------------------|------------|
| 1) smoking   | 2) working, sleeping | 3) going   |
| 4) bothering | 5) Seeing, believing | 6) passing |
| 7) Smoking   | 8) breaking          | 9) making  |
| 10) meeting  |                      |            |

### Exercise 9

- |                      |                             |
|----------------------|-----------------------------|
| 1) helping           | 2) to leave, giving, to say |
| 3) cutting, to go    | 4) having, to work          |
| 5) to stop, drinking | 6) to avoid, being          |
| 7) to switch, going  | 8) exceeding, to make       |

### Exercise 10

- |            |            |              |
|------------|------------|--------------|
| 1) Sliding | 2) moving  | 3) revolving |
| 4) smiling | 5) nagging |              |

### Exercise 11

- |               |                  |                 |                |
|---------------|------------------|-----------------|----------------|
| 1) had taken  | 2) had completed | 3) have arrived | 4) has written |
| 5) has blown. |                  |                 |                |

### Exercise 12

- |             |        |        |        |         |
|-------------|--------|--------|--------|---------|
| 1) may, can | 2) can | 3) can | 4) may | 5) can, |
| 6) can      |        |        |        |         |

**Exercise 13**

- |            |            |            |            |           |
|------------|------------|------------|------------|-----------|
| 1) must    | 2) have to | 3) must    | 4) have to | 5) must   |
| 6) have to | 7) must    | 8) have to | 9) must    | 10) must. |

**Exercise 14**

ought to, must, ought to, must, has to

**Exercise 15**

- 1) He suggested that we should postpone the trip.
- 2) He was anxious that everyone should have a chance to work.
- 3) He recommended that I should buy a new car.
- 4) He agreed that the two winners should share the prize money.
- 5) He arranged that I should receive higher education.

**Exercise 16**

- |           |            |
|-----------|------------|
| 1) would  | 6) would   |
| 2) should | 7) would   |
| 3) would  | 8) should  |
| 4) would  | 9) would   |
| 5) should | 10) should |