UNIT 1

Collecting in the Cameroons—I

1. When I arrived in the Cameroons for the first time what struck me most was the very vivid colouring of the undergrowth and the enormous size of the trees. There were leaves of every shade of green and red imaginable, from bottle green to pale jade, and from pink to crimson. The trees towered up to 200 and 300 feet into the air, their trunks almost the circumference of a factory chimney, and their massive branches weighed down with leaves and flowers and great coiling creepers.

2. I landed at the little port of Victoria and had to spend a week or so there, preparing for the journey into the interior. A great many things had to be done before I could start on the actual work of collecting. There were Africans to engage as cooks or house-boys, various stores to buy and a great many other things as well. Also the necessary permits to hunt and capture the animals I was after had to be obtained, for all the animal life in the Cameroons is strictly protected and, unless you obtain Government permission, you are not allowed to capture or kill any animals or birds. Eventually, when all this had been done, a lorry was hired and the food and equipment piled into it, and I set off. In those days there was only one way leading into the interior of the Cameroons and this, if followed far enough, led you to the village of Mamfe on the banks of the Cross River, some 300 miles from the coast. It was at this village I had chosen to make my base camp.

3. The earth you find in the Cameroons is red, very like the earth you see in Devon, and so the road was a bright brick colour winding through the hills, lined on each side by immense forest trees. As we drove along, I could see hosts of brilliant

birds feeding in the trees, tiny glittering sun-birds sipping nectar from the flowers; great glowing plantain eaters, like giant magpies, eating wild figs; and sometimes the passage of the lorry would frighten a flock of horn-bills which would fly off across the road, making tremendous swishing noises with their wings, and honking dismally.

4. In the short undergrowth at the side of the road scuttled large numbers of Agama lizards. These reptiles are almost as bright in colour as the birds, for the males have vivid orange heads, and the body decked out in blue, silver, red and black, while the females are rose-coloured with bright apple-green spots. They have a curious habit of nodding their heads vigorously up and down, and look very peculiar dashing here and there in pursuit of each other, suddenly stopping to nod their brightly coloured heads. Almost as numerous as these lizards were the pygmy kingfishers, minute little birds, smaller than a sparrow, with bright blue backs, orange shirt fronts and coral red beaks and feet. Unlike the English kingfisher, these little birds live on locusts, grasshoppers and other insects. Dozens of them were perched on the telegraph wires, or on the stumps of dead trees on the roadside, all peering down hopefully into the grass and bushes below. Occasionally, one of them would drop off his perch like a stone and, when he fluttered out of the grass again, a grasshopper that was almost the same size as himself would be clutched firmly in his beak.

5. Three days after leaving the coast I reached Mamfe. I had chosen this village as a base camp for a variety of reasons. When you are collecting wild animals you have to choose your base very carefully: it has to be within fairly easy reach of some sort of store, so that you can obtain sufficient supplies of tinned food, nails, wire netting and other important things, and also it has to be fairly near a road, so that when the time comes to depart you can bring your lorries near enough to the camp to load up. Secondly, you have to make sure that your base is going to be in a good collecting area, a place that is not so full of farms and people that most of the wild animals have been driven away. Mamfe was excellent in this respect, so a camp clearing was made on the banks of the river, about a mile away

from the village, and the big marquee I had bought was erected. For the next six months this marquee was to act as a home for myself and my animals.

6. The first thing I had to do, before I could even start collecting, was to make sure that the base camp was functioning smoothly. Cages, pens and ponds had to be built, as well as palm-thatched huts for the Africans I employed. I had to arrange for an adequate food and water supply, for when you have collected 200 or 300 animals and birds, they manage to eat and drink a very great quantity every day. Another important thing was to interview as many of the local chiefs as possible, showing them drawings and photographs of the creatures I wanted and telling them how much I was willing to pay for specimens. Then, when they went back to their villages, they told their people, and so eventually I had all the villagers for miles around helping me in my work.

7. Then, when everything was ready and there was a great pile of empty cages waiting to be filled. I could start hunting the strange animals that I had travelled so far to find.

TASKS

I. Refer to a dictionary to get the definitions of *undergrowth, trees, creepers.* Explain the differences.

II. Tick the appropriate response:

a. The word "stores" in paragraph 2 refers to:
   i) room where food grain is kept
   ii) shops
   iii) provisions.

b. The writer had to obtain a permit to hunt in the Cameroons because:
   i) hunting was strictly prohibited
   ii) it was his first visit
   iii) requests were considered.

c. The writer refers to a "collecting area" as being:
   i) near the banks of a river
   ii) an uninhabited place
   iii) in the centre of a village.

d. Success in the capture of wild animals depends to some extent on:
   i) the resources of the hunter, e.g. camping requirements, etc.
   ii) knowledge of the terrain
   iii) co-operation from the villagers.

III. List colours and sounds described in paragraphs 3 and 4

IV. a. Find appropriate verbs to describe the movement of each of the following animals (e.g. lizard—scuttles):
duck, bear, horse, snake, rabbit, kangaroo.

b. Find appropriate words that refer to a group of each of the following (e.g. a caravan of camels):
cattle, hornbills, lions, fish, wolves, elephants, birds, bees, girls.

V. a. Explain the difference in construction of the sentences of the types A and B.

Type A: Active

1. I *had chosen* this village as a base camp for a variety of reasons.
2. I *had bought* a big marquee.

Type B: Passive

1. The marquee *was erected*.
2. Eventually, when all this *had been done*, a lorry was hired and the food and equipment piled into it, and I set off.

b. Find other examples of each construction (Type A, Type B) from the text.

VI. a. Show how the use of "have" in sentences of Types A & B is different from that in the following sentences:

Type C:

1. I *had* to spend a week or so there preparing for the journey.
2. You *have* to make sure that your base is going to be in a good collecting area.

Type D:

1. The males *have* vivid orange heads.
2. They *have* a curious habit of nodding their heads vigorously up and down.

b. Mention one other use of "have".

Collecting in the Cameroons—II

1. We spread out in a circle and walked through the trees in different directions, trying to find out which way the pack had gone. At last a shrill yodel from one of the hunters sent us all hurrying to the spot where he was waiting, and in the distance we could hear the sound of running water. As we ran towards it, the hunter explained to me, between gasps for breath that, if the dogs had been led to the edge of the river by the quarry, the roaring of the water would cover up the noise of the bells. This explained how we had managed to lose the pack. When we reached the water, we splashed our way upstream and came eventually to a place where the water cascaded and foamed over a small waterfall some twenty feet high. Round the base of the fall was a great jumbled mass of huge boulders fully overgrown with moss and small plants, and amongst these big rocks we could see the tails and the rear ends of the dogs, while above the roar of the water we could hear their shrill yapping. Peering among the rocks, we saw for the first time what it was we had been hunting: it was a tremendous Nile monitor, a great lizard, measuring six feet in length, with a long whip-like tail and heavy curved claws on his feet. He had backed himself into a cul-de-sac among the rocks and was facing the opening and keeping the pack at bay by lashing with his great tail and hissing with open mouth if they ventured too close.

2. We were about to call the dogs off when one of them, more stupid than the rest, rushed in among the rocks and grabbed hold of the monitor's neck, hanging on as tightly as she could. The monitor returned the compliment by clasping her ear in his mouth, and then hunching himself up he brought his great hind legs on to the dog's back, ripping the skin open with his sharp claws. The dog, giving a yelp of pain, let go of his neck, and, as she started to retreat, the monitor lashed round with his tail and sent her rolling over and over among the rocks. Hastily we called the rest of the dogs off and tied them to a nearby tree, and then we had to decide on the best way to capture the lizard, who lay hissing among the rocks, like some great prehistoric monster.

3. We tried to throw a net over him but the sharp-edged rocks kept getting caught in the folds, and in the end we gave this up as a bad job. The only other method I could think of was to climb up above him, and, while someone attracted his attention, get a noose round his neck. Explaining to the hunters what I wanted done, I scrambled up over the slippery rocks until I was perched about six feet above where the monitor lay. I made a running noose at the end of a long piece of rope and then, leaning over, lowered it gently towards the reptile. He did not appear to associate the length of rope with the human beings about him, and so it was quite easy for me to work the noose over his head and pull it back gently until it lay round his neck. Then I pulled it tight.

4. Unfortunately, in my excitement, I had forgotten to tie the end of the rope to anything and, what is more, I was kneeling on the loose end. As soon as the monitor felt the noose tighten round his neck, he shot forward like a rocket, pulling the rope taut, so that it jerked my knees from under me and I started to slip over the edge of the rock. On that smooth surface, wet with spray from the waterfall, I could find nothing to grip, and so I slipped over the edge and crashed down in the gully below. As I fell, I remember hoping that the monitor would be so frightened by my sudden appearance out of the clouds that he would not wait to give battle. I had no desire to get any closer than necessary to his well-armed feet.

5. Luckily, that is exactly what happened. The monitor was so startled that he dashed out from among the rocks and scuttled off down the river bank, trailing the rope behind him. But he did not get very far, for as soon as he was clear of the rocks, the natives threw the net over him and within a few seconds he was writhing and hissing in its folds. We eventually got him out of the net and tied to a long pole, and I dispatched one of the hunters back to camp with him. I was extremely pleased to have caught this big reptile, but it was not exactly what we had come up the mountain to hunt for, and so we continued on our way through the forest.

(both passages from Gerald Durrell *The New Noah*)

TASKS

I. a. List all phrases that describe the chase, e.g. We *spread out* in a circle.
Restrict yourself to paragraph 1.

b. Underline the word that follows the verb in each phrase. Notice that words such as "to", "towards" define a sense of direction. e.g. hurrying *to* the spot, as we ran *towards* it.

c. Find the verbs from your list of phrases that are not followed by prepositions.

II. The actions of the hunter during the course of the hunt appear in sequence as: walked — splashed — scrambled up — perched — leaned over — lowered — pulled tight — knelt on — slipped over — crashed down. List in sequence the actions of the Nile Monitor till the point of its capture.

III. *Group Work: Role Play*
Form groups, each taking on one of the following roles: zoo animals, zoo officials, visitors to the zoo.
In the character of your role, express your dissatisfaction with present conditions. Prepare and present a list of complaints on behalf of your group.

IV. Find from the passage, the information to which each of the italicised words refers.

a. *This* explained how we managed to lose the pack.

b. The only *other* method I could think of was to climb up above him, and while someone attracted his attention, get a noose round his neck.

c. Explaining to the hunters *what I wanted done*, I scrambled up over the slippery rocks until I was perched about six feet above where the monitor lay.

d. Luckily, *that* is exactly what happened.

UNIT 2

Crash Protection in Road Accidents

1. Little change may be expected in road accident rates within the next 5-10 years because alterations in the behaviour of road users and improvements in the environmental infrastructure of roads can come only gradually. *Although* the rising curve of road accidents is beginning to level out and *even* shows a downward trend in some industrialised countries, the projections of mortality, morbidity and disability rates all suggest substantial increases within the next few years. Collisions will continue to occur, and the use of crash protection devices in motor vehicles may be considered the most important area of public health activity that exists at present in many countries.

2. *In general*, road accidents consume roughly 1% of the gross national product of most countries, whether industrialized or still developing. *Because of* the relatively great effectiveness of crash protection measures and restraint systems, the benefit from their introduction is likely to largely outweigh their cost.

3. Most road vehicles are cars and the majority of road injuries are to car occupants or to pedestrians. *In global terms*, some 40% of fatalities are car occupants, 30% are pedestrians, and 20% are motorcyclists. It must be remembered, however, that on an average motorcyclists travel only about one quarter the distance covered by the average car, so that the risk of death per mile travelled is between 6 and 20 times higher. Thus the proportion of motorcycles in the vehicle population has a strong influence on the accident rate.

4. In developing countries, conditions may be such that road death rates rise with the rapid growth in vehicle ownership instead of tending to decrease as they do in some industrialized

countries where there seems to be an increased sophistication in vehicle use. Studies have shown that urban road death rates in developing countries can be as much as eight times those in European cities.

"Active" and "Passive" crash protection

5. The last decade has seen great advances in the developed countries in the adoption of protective devices and restraint systems which can minimize the severity of injuries caused by road traffic accidents. Indeed, through the collaboration of engineers and physicians, this has become a recognized and successful branch of preventive medicine.

6. These devices and systems are termed "active" if the road user is required to take some action such as wearing a seat belt, and "passive" where the design of the vehicle is changed e.g. fitting antiburst door locks to minimize the risk of ejection.

7. *Seat belts.* The most important active crash protection device has been found to be the seat belt. Its universal use would reduce car occupant deaths and injuries by approximately a half. The advantages of seat belt use are so great that some 28 countries have made it compulsory. An as yet unanswered question is what level of usage can be obtained by enforceable legislation? In developed countries, voluntary usage rates appear to stabilize at around 30%, but vary from 10% in cities to 60% on express ways. Propaganda campaigns have marginal and only temporary effects on these levels. With compulsory legislation, usage rates in the general traffic stream rise to between 70% and 85% after a learning period. In developing countries, it is however doubtful if the same results would be produced.

8. Recent studies in Australia suggest that car occupants involved in reported accidents have seat belt usage rates significantly lower than those found in general surveys of such usage. It would seem, then, that the people most likely to have collisions are actually the same as those that are most resistant to compulsory seat belt use.

9. The advantages of belt use apply to all sitting positions in the car, and the fitting and use of rear seat belts should be encouraged in those countries that have omitted to do so.

10. Other effective active measures are crash helmets for motorcyclists, and child restraint systems and head restraints for car occupants. When head rests can be adjusted vertically, however, surveys have shown that approximately 80% of them are kept in the fully down position, thus rendering them ineffective. A preferable design is one fixed at the correct height, and if necessary hollow to minimize vision restrictions.

11. Most of the passive devices are now incorporated into the basic design of the vehicle; of all cars currently manufactured, about 10% will cause a serious injury or a death to a road user before the car is scrapped. In developing countries, the percentage may be several times higher. Hence, crash-worthiness is a normal and important design criterion. Over the last decade, car design has moved from an almost entirely laissez-faire situation to one where it is largely controlled by legislation. That tendency is likely to continue.

12. Because legislation of the basic design of cars is conducted in a very small number of industrialized countries, it is difficult for any other single country to influence the design of the car it purchases. It is, therefore, important that the legislation that controls design should take account of more factors than those involved in the particular needs of the developed countries.

13. The passive devices which have upto now contributed most to injury reduction include energy-absorbing instrument panels, anti-intrusion steering assemblies, high penetration-resistant laminated windscreens, anti-burst door locks and improved seat design. Studies of the effectiveness of these changes in design show in general very substantial improvements over older designs, even though some systems are not yet performing optimally. Of great value also is exterior vehicle design that will minimize injuries to pedestrians and riders of two-wheeled vehicles.

Motorcycles, mopeds and bicycles

14. The risk of accidents with casualties is considerably higher for mopeds and motorcycles than it is for cars, while pedal cyclists

share with pedestrians the role of almost passive exposure to the violence of motor vehicles. At present in some countries more than one third of all traffic deaths are found among users of two-wheeled vehicles, with a large proportion among riders of mopeds and bicycles.

15. Exposure and accidents data on two-wheeled vehicles are fragmentary, but there is already significant information to show the extremely high risk levels associated with large capacity motorcycles. There is a good case for limiting engine size, as has been done in Japan where no motorcycles with engines over 750 cc are allowed. For the prevention of accidents, improvements are needed in driver behaviour and conspicuity. The use of crash helmets should be compulsory everywhere, while the wearing of leather clothing and strong boots can help to reduce the severity of injuries.

In developing countries

16. At the present time, when the number of vehicles on the roads is expanding rapidly in many developing countries, it is important to introduce public health measures, such as the fitting and use of seat belts, which present much less difficulty when vehicle ownership levels are relatively low.

17. The proportion of light vans and buses to cars is much higher in most developing countries than it is in Europe, and the life span of such vehicles is generally much longer. The application of crash protection measures to these classes of vehicles should therefore receive due attention when the legislation that controls design world-wide is framed.

18. Road safety programmes in the developing world need to be encouraged by a transfer of knowledge from the highly motorized countries. One possible way of doing this would be to send small teams of specialists for short periods to examine the main problems in a developing country and recommend courses of action. Generally speaking, with the available knowledge the developing countries could avoid many of the road accident problems

which have only recently been recognized in highly motorized societies.

19. Experience has shown that, especially in developing countries, legislation does not ensure conformity of behaviour on the part of road users. Public health education programmes must therefore be implemented in parallel with the introduction of essential new road safety measures.

(from *WHO Chronicle*, Vol. 33, No. 10, October 1979)

TASKS

I. a. Read paragraphs 1-4 and indicate, giving reasons, whether the following are true or false.

i. The percentage of deaths in motorcycle accidents is lower because there are fewer motorcycles on the road than cars.

ii. To introduce crash protection devices would not prove to be beneficial due to economic reasons.

iii. With an increasing awareness of road safety devices in vehicle users in some parts of the world, there is a downward trend in the number of car accidents.

iv In all countries, crash protection measures are given priority in public health programmes.

v. Decrease in accident rates depends on improvement of motor vehicles and not on improvement of roads.

b. Find other appropriate word|words to replace each word italicised in paragraphs 1-4.
e.g. *Although* in paragraph 1 may be replaced by *despite the fact that* or *though*.

c. Identify what the word "this" refers to in paragraph 5.

II. a. Complete the following:

i. A lower rate of seat belt usage leads to _____.

ii. A study in _____ supports this claim.

b. From your reading of paragraphs 5-13, complete the following in note form:

Safety Measures:—

Cars:

1. Active measures: _____

2. Passive measures: _____

Mopeds, Motorcycles, Bicycles:

1. Active measures: _____
2. Passive measures: _____

III. From the information in paragraphs 16-19, list four recommendations for introducing crash protection measures in developing countries.

IV. *Group Work*:
On similar lines, draft a set of recommendations regarding safety measures against fire accidents in the house.

V. Present in tabular form the information in paragraphs 3 and 7.

VI. List a few measures for educating the public in developing countries regarding crash protection devices.

VII. Prepare a poster, using appropriate visual aids, on road safety devices for users of mopeds motorcycles bicycles. Provide an appropriate slogan.

UNIT 3

Presentation of Good Posture

TASKS

1. Fill in the blanks with appropriate words:—

There is no one method of teaching any one patient to assume and experience the feeling of good posture. The method and the technique selected for a particular patient must depend on the patient and the physiotherapist, but one thing appears to be essential and that is _____ the physiotherapist must have faith in the method she adopts.

_____ who have habitual poor posture often feel uncomfortable and unnatural in any position other _____ the one to _____ they have become accustomed. _____ is not surprising, but emphasises the importance of convincing the patient _____ good posture "looks" right, and will prove efficient in the long run. In_____ words, the physiotherapist must "sell" the pattern of good posture.

A mirror, posture recorder or photographs may be useful for _____ purpose, so _____ the image can be compared _____ pictures of experts which demonstrate a good general pattern of alignment. Video tapes may also be used. _____ is particularly impressive in training dynamic posture in activities such _____ tennis, diving and lifting where faulty posture can have such a marked effect on the efficiency of the movement.

Training of static postures in the erect position is basic, partly because most people, _____ the exception of very small children, are compelled to spend most of _____ waking

hours in upright positions ———————— are relatively static, for example, standing and sitting. Even in walking the alignment of the trunk remains more or less the ————————, and incidentally the ability to remain still without undue effort, when the occasion demands ————————, is a habit well worth acquiring.

In the erect postures, the control of ———————— segment of the body in relation to the rest is by no means a simple thing to learn. The position of the ———————— is profoundly influenced by the position of the head, of the pelvic tilt, and by the state of comfort and position of the feet. Different authorities stress the importance of ———————— or other of these factors but in fact they are all important and any one may prove to be the dominant factor.

(from M. Dena Gardiner *The Principles of Exercise Therapy*)

II. Write a paragraph describing the appropriate posture you should adopt:
   a. When attending a lecture in the classroom.
   b. When eating a meal.
   Try to use some of the following words:
   upright, slant, slouching, bending, drooping, tilt, dangling, crooked, crouch, straight, stretch, erect, stoop.

III. Give the opposites of the following:
   convincing, accustomed, efficient, impressive, useful, alignment.

IV. Explain the following terms:
   a. static posture
   b. to "sell" the pattern of good posture
   c. habitual poor posture.

UNIT 4

The Magnificent Tiger

1. Crouching at the edge of a clearing in an Indian jungle/ Ranjit Singh/a veteran tiger hunter/raised his rifle as beaters drove his quarry nearer. Suddenly a beautiful male tiger burst out of the high grass/loping straight across the open corridor only 30 yards away.

2. In the morning sunlight its striped reddish coat gleamed so splendidly/and its muscular body rippled with such liquid grace/that Singh gazed spellbound. In a moment the animal vanished. "I wanted to kill that tiger"/recalls the hunter/now an expert wildlife photographer/"but it was simply too beautiful to kill. And I will never shoot another". That promise was a fitting tribute to one of the most fascinating and graceful of all animals.

3. Though tigers are large animals they are seldom seen. On exposed terrain the tiger's camouflaged body can enable it to vanish before the observers' eyes. Sometimes a mere 10-inch tuft of grass can serve as "cover".

4. A tiger possesses phenomenal hearing and sight which compensate for a mediocre sense of smell. Sher Jung reports that a tiger's ears register more than the seven octaves normal for humans. As for its vision, night-time hunters know that a tiger will see even the slightest movement.

5. Tigers sleep or catnap by day; it is not till evening that they start their hunting. An hour or two before dusk they start their rounds roving up to 10 to 15 miles nightly. An adult tiger devours 40 to 70 pounds at a single meal, yet may top that off with several additional snacks the same night. But it may not eat again for several days.

Man-eating tigers?

6. The popular conception of the tiger as savagely aggressive applies only to the man-eating individuals. Although few in number, India's man-eaters took a toll of more than 1,000 persons annually until well into this century. Most man-eaters had been disabled—usually by being wounded by a hunter—and were unable to catch their normal prey.

7. The average tiger tends to give man as wide a berth as possible even in face-to-face confrontations. A forest ranger was cycling round a bend on a woodland track one day when he nearly collided with a tigress. Twice she reared up, snarling and growling, but the ranger remembered the standard instructions for such encounters: "Never panic; stare the beast down". He did just that, and the tigress grumbled off.

8. Tigers are generally solitary creatures except during the brief mating season. Two or more suitors may fight for the female in bloody battles. The female takes no part in the fray. The winner drives off his competitors, and mating ensues. Shortly thereafter the male and female part company. About 16 weeks after conceiving, the tigress bears her cubs (each weighing $2\frac{1}{2}$ to 3 pounds). The usual litter size is two to four, though litters of five or six sometimes occur. Fewer than half of the cubs ever reach maturity. Predators (chiefly hyenas, wild dogs, and crocodiles) and disease are the major causes of this high mortality rate.

9. Frolicsome as kittens, the cubs tumble, grapple, and pounce at shadows, including their own. They display affection for their mothers, readily shifting from play to caresses. American zoologist George Schaller watched one take its mother's head between its forepaws and smother her face with fervent licks.

10. At first they learn to stalk and kill small creatures. Trailing her on hunting forays, they imitate her moves. In the first 4 weeks the cubs quadruple in size; in another few weeks, still unweaned, they begin to eat chewed meat disgorged by the mother. Gradually they progress to assaults on deer, buffalo calves and larger game, until at the age of 2 they have become fully independent of their mother. Then, when the cubs are about 6 months old, the mother initiates them in the skills of the hunt.

11. Today tigers are close to extinction. Tigers are endangered because the land they need has been taken for farming and logging. They have no place to go. Sanctuaries in India, Nepal, and other countries protect tigers and their prey and habitat. But much more land needs to be set aside, for tigers are wanderers, and each individual animal needs at least 10 square miles of living space.

12. A demand for tiger skins and heads also jeopardizes the tiger. In most of the animal's range, tiger hunting is illegal, but poachers threaten the continued existence of the great cat.

13. In the 18th century William Blake praised this magnificent creature in a stirring poem: "Tyger, tyger, burning bright/ In the forests of the night....." The tiger's light may not go out completely. But the future is precarious indeed, for the species is at the mercy of its mortal enemy—man.

(from Reader's Digest *Our Magnificent Wildlife*)

TASKS

I. a. Read the first three paragraphs aloud, with pauses as indicated. The pauses have been introduced to bring proper significance to your reading.

b. *Group Work:*
Introduce pauses in the next four paragraphs wherever necessary and nominate one person from each group to read the passage aloud.

II. a. Find words from the passage in which the letters h, t and l are silent. Also find words in which the letters are sounded.

b. Notice the different sounds of the letter d in the word "individual" and of the letter s in the words "sick", "music" and "fusion". Find words from the passage in which the letters d and s are pronounced in the above ways.

III. Rewrite paragraph 10, rearranging the sentences in the correct order.

UNIT 5

Butterflies in Jeopardy

TASKS

I. Insert a, an or the *wherever necessary:*

1. What is your idea of _____ quintessence of beauty in _____ butterfly? Probably to many people's minds would come, in answer to this question, _____ image of _____ iridescent blue morpho, often sold as _____ art object. Observers have striven in vain to explain _____ impact of morphos, which have been compared to stars, flowers, flames. _____ sun is reflected so brilliantly from _____ wings, 7 or 8 inches across, that _____ insects can be seen from low-flying airplanes. Time was, but is no more, when_____ tropical American morphos appeared in swarms, dominating _____landscape.

2. In 1848 _____ British naturalists Henry Bates and Alfred Russel Wallace found about 700 species of butterflies within _____ hour's walk of Para, Brazil. Modern writers love to recall and describe the clouds of butterflies they saw as children beside flower-bordered dirt roads. But far fewer are seen today, for butterflies have suffered _____ dramatic decline in numbers.

3. _____ earliest threat to butterflies in modern times was probably _____ collecting mania that struck the Western world with _____ awakening of scientific interest. Fostered by greed and vanity, the interest in collecting increased. The population of some of _____ loveliest tropical butterflies were decimated by collector's nets, some insects ending up in museums or in cases, in private homes, others

appearing in jewelry, on box lids, on trays, in pictures, wherever ———— exquisite bit of colour and workmanship could be admired. Prisoners deported from France to ———— penal colony in South America picked up extra funds by capturing morphos for ———— European market. Even as recently as 1967 ———— private collector paid $ 2500 for ———— birdwing butterfly.

4. In spite of the temptations implicit in such sums of money, ———— great majority of butterflies now faces far more serious threats than collecting for either scientific or commercial purposes. One is ———— increasing use of insecticides, which are seldom aimed specifically at butterflies in the vicinity.——— few years ago about 600 species of butterflies inhabited the meadows and marshes of Sikkim, ———— small Indian protectorate in ———— Himalayas. Unfortunately malaria-carrying mosquitoes also lived there, and the area was massively sprayed with DDT. Along with the mosquitoes, most of ———— butterflies perished.

II. Fill in the blanks with appropriate words from the list given below:

that, its, those, whose, they, any, these, their, them, her; one, both, she, other, which, this.

5. Many commercial orchards have been so saturated with insecticides that ———— have become barren of ———— butterflies and insect-eating birds. The giant swallow-tail butterfly, ———— caterpillars feed on leaves in the citrus groves of Florida, is not a target of the spraying. But it will eventually disappear from groves ———— are regularly sprayed, and the groves will be poorer, not richer. The blemish-free fruit—— we buy has been paid for in part with the lives of viceroys, red-spotted purples, and striped hairstreaks.

6. The tiger swallowtail, ———— ranges from the Hudson Bay region in Canada to Florida, spends ———— time flying in and out of woods, stopping to visit flowers in a meadow, disappearing into the woods a few minutes later. The trees afford ———— lovely yellow and black insect a perfect camouflage as sunlight streams through the leaves onto ———— wings.

7. After mating, the female swallowtail lays ———— eggs

on the new growth of trees; especially birches. ———— requires not just one birch but many, for ———— lays her eggs one at a time and on different trees. The eggs develop into caterpillars ———— feed on birch leaves. At the end of summer ———— caterpillars that have not become butterflies crawl or drop to the ground and develop into pupae in sheltered spots, where ———— remain hidden until spring. The tiger swallow tail needs meadows, woods with birch trees and sufficient debris for hiding places, free of insecticides and herbicides.

8. Butterflies as a group, of course, are not considered pests. ———— are simply innocent casualties in man's war against unwanted plant growth and destructive insects. In a great many cases the caterpillars of butterflies feed on and probably help control weeds such as thistles, nettles, knotweed, chickweed, sneezeweed and milkweed. Thus they probably help control ———— weeds. Many desirable wildflowers and ———— plants actually need butterflies; as pollinators, butterflies are second only to bees.

9. The gravest and most widespread danger to butterflies all over the globe is not pesticides; it is the disturbance or destruction of habitats. Draining and excavating bogs in Canada and the United States are endangering the bog copper butterfly; draining the marshes is endangering Britain's largest butterfly, a swallowtail living only on the Norfolk Broads in eastern England. The building boom in Florida has nearly eliminated Schaus' swallowtail, which occurs nowhere else in the world.

10. Near San Francisco once lived the xerces blue butterfly, ———— fed on a trefoil growing on sand dunes. But the trefoil could not tolerate disturbance of —— soil, and when people began to move in, in numbers, both plant and butterfly disappeared.

11. Two British butterflies, the large tortoiseshell and the white-letter hairstreak, are dependent on elm trees for food for ———— caterpillars. The Dutch elm disease, ———— has killed well over a million elm trees in southern England, has had its effect on ———— butterflies too.

III. Rewrite paragraphs 12 & 14, arranging the sentences in the correct order.

12. But one explanation traces the decline to an epidemic of myxomatosis (a viral disease) that killed a great many rabbits in England in 1953. No one knows why the numbers of meadow browns and chalkhill blues have decreased so markedly in certain areas of the chalk hills of southern England. As they vanished, longer grasses and shrubs invaded the hills. Sometimes the cause of the decline of a species is much more complicated. Then small mammals — voles and shrews — moved into the area. The rabbits had been the chief natural grazers on the chalk hills. And since shrews are known to feed on the young of butterflies, shrews may have caused the decline in the butterfly population.

13. Many governments have taken steps to give butterflies the protection of the law. In Pacific Groves, California, where huge numbers of migratory monarch butterflies spend the winter, there are strict laws against disturbing them. Papua and New Guinea forbid export of seven species of birdwing butterflies, including the world's largest butterfly, with a wingspan as great as 10 inches. Other nations throughout the world, including Japan, Mexico, Ecuador and Switzerland, are also protecting their rare butterflies.

14. Some butterflies were set free in 1927, and the introduction was so successful that four years later 100 living pupae were returned to the Netherlands for the reserve that country had set up. Conservationists have kept a careful watch on the Dutch large copper colony in Britain; though drastically affected by a flood in 1969, the colony is thriving once again. Then in 1915 schoolboys in the Netherlands discovered some close relatives of the extinct butterfly. The story of the large copper in England shows the increasing concern people are giving to butterflies. After careful preparation of wetlands, including the establishment of food plants, eggs and larvae were brought from the Netherlands and bred in captivity. Both over-collecting and marsh drainage had contributed to the extinction of the British large copper by the middle of the 19th century.

(all three passages from Reader's Digest *Our Magnificent Wildlife*)

IV. *Group Work:*

Re-read all the passages and work on the following:

a. Define the problem.

b. List factors leading to the problem.

c. Recommend a plan of action to tackle the problem.

UNIT 12

The Study of Posture

The study of posture is fundamentally related to the problems of keeping the body working with gravity and with a minimum amount of muscle tension. Maintenance of certain body positions entails a greater expenditure of energy than does the maintenance of others. Using the body correctly is analyzed thus:

Standing: Head, neck, chest, abdomen, balanced vertically. Weight borne by body framework. Minimum strain on muscles and ligaments.

Sitting : Body straight from hips to neck. No flex or bend at waistline.

Bending : Bend at knees or hip, not back.

Working with gravity in the household implies such a simple consideration as cutting vegetables down on a board instead of whittling them into the air. Considerable attention has been given to the study of posture in relation to correct heights for working surfaces in the household.

Although there are relatively few heavy loads to be handled in modern households, a woman may encounter a fair number to lift during the course of a day or a week. A baby is a constant load until he reaches the age at which he can transport himself. In general, for lifting a load, the leg, not the back muscles, should be used. This is accomplished by standing or kneeling close to the load and lifting with a slow, steady pull (see fig. 12.1). In pushing a heavy piece of furniture, the force should be at the center of the furniture (see fig. 12.2). As far as possible, carrying a heavy load is to be avoided, but if it must be done, carrying close to the center of the body causes less strain on the back.

The same household tool may be used effectively or ineffectively as far as posture is concerned without relationship to the accom-

UNIT 13

Evidences of Variations in Output

1. Variations in output, whether due to psychological or physiological causes, consist of two types: decrease in (a) quality or (b) quantity of work performed.

2. Accidents as Indicators of Quality of Work:—

That quality of work suffers with the onset of fatigue or boredom is demonstrated by the increase in errors toward the end of a workday. Accident rate is probably a valid index of quality of work. In a study by Imbert and Mestre 27,000 accidents among over 60,000 workmen were charted. The results showed that accidents increased progressively during the morning work hours and, after abating somewhat following the midday rest, they again became continuously more frequent. The maximum number of accidents for the last hour of the afternoon was notably higher than for the comparable period in the morning. Accidents increase as the number of hours of work increases. Brozek reports that the number of accidents in a twelve hour work period was three times greater than the number in a ten hour day. Such increases are, no doubt, due to increased fatigue. Boredom appears to affect accident rates as well as the production curve, for on night shifts accidents were at a maximum at the beginning of the night and dwindled down fairly regularly till the early morning. Although there is evidence that occurrence of accidents is due in part to a personal factor, their number is still an indication of decreased quality of output.

3. Work Curve as Gauge of Quantity of Work:—

Changes in quantity of output are measured through the work curve. When the worker is engaged at a task which is accomplished in identical units, such as number of sheets ironed per hour,

the number of those units produced in a given amount of time may be taken as an index of his accomplishment. If equipment, methods, and materials remain the same, changes in output may be assumed to result from changes in the worker, either physiological or psychological. It has been found that rate of production of work follows a somewhat typical form, with variations according to the cause of change. The work curve, a graphic method of showing the quantity of work produced in relation to the passage of time, has been much more thoroughly studied than have comparable criteria for quality of production; yet its implications and causes are not completely understood. Nevertheless, an analysis of the curve gives evidence of variations in output of work and suggests means of controlling such variations.

4. Wyatt and Langdon charted the production curves of sixty-eight workers and found they could be classified into four groups (See Fig. 13.1). He suggests that type (a) is produced when the worker is interested but suffers from progressive fatigue; this curve illustrates true fatigue of a neuro-muscular origin. Work curve (d) results if the worker finds his work distasteful and is bored. The increase in output is due, probably, to anticipation of the end of the stint and the fact that the worker knows that he must produce at least a minimum of work. This could apply to homemakers as well. Wyatt found, however, that the work curves of most of his sixty-eight subjects fell in classifications (b) or (c), and he concluded that the pattern of an individual's work curve is a reliable indication of the amount of boredom present. Type (a) represents no boredom, type (b) slight boredom, type (c) moderate boredom and type (d) severe boredom.

5. Typical Work Curve:— In its 18th annual report, the Health Research Board of England gives findings showing the typical work curve as "saddle-backed", starting sluggishly with a sharp rise as the worker gets into his stride, falling off in the middle of the spell, with a fresh spurt as the work nears its end, and a final falling off during the last hour (See Fig. 13.2). While the central portion of this curve is similar to the Wyatt (b) and (c) curves, its beginning and end are very different from any of the Wyatt curves.

6. In analysing this work curve, the preliminary increase, a-b (Fig. 13.2), signifies the warming up period, known as the WU.

The letters b-c indicate the plateau of greatest steady production; c-d shows the drop in production due to beginning fatigue or boredom. The curve rises again from d to e as the worker anticipates the end of the work day, and e-f shows the effect of accumulated fatigue at the end of the day. The worker may stop at e or continue until f. The drop from c to d is greater in the case of light repetitive work (See Fig. 13.2). It is supposedly due to boredom developing during the job.

7. In heavy manual labour, however, the final decrease will be greater (see figures), and it is possible that output may fall to zero if work is continued to the point of exhaustion. Studies have shown that the work curve is typical of both the work day and the work week, for in industry, production is nearly always low on Monday and at the end of the week. The end-of-the-week drop does not occur in the case of workers who are learning a job or whose skill increases with practice.

8. Good and Poor Work Curves:— The most desired work curve is one in which the WU is represented by a steep line, showing that the worker "got into the swing" of work rapidly and achieved a high plateau of production. The longer the plateau before production decreases, because of either boredom or fatigue, the greater the amount of work accomplished throughout the entire time.

9. However, even though fatigue sets in at the usual time, the actual plateau would be longer due to the more rapid WU. On the other hand, if the WU is gradual and prolonged, production may never reach a high level and the attainment of maximum production for the period is correspondingly delayed (See Fig. 13.6).

10. Regardless of the speed with which the WU is accomplished, output increases during this period because muscle tissue becomes more efficient after some exercise. Carbon dioxide and lactic acid act as stimulants when present in small quantities, although in large quantities they cause true fatigue. Thus their effect during the WU is beneficial.

11. A poor WU may be one of two types: (a) a long sloping line which eventually reaches a high plateau (See Fig. 13.7) or (b) a comparatively short line which ends in a low plateau of greatest production (See Fig. 13.6).

12. The former is likely to occur in the case of a worker whose mind is still engrossed with another task, who is bored, or who is emotionally upset. The second type of undesirable WU—ending in a low level of production — may be due to the fact that the worker is inherently slow, or that he has not yet developed sufficient skill in this particular task, or that his energy is depleted because of previous activity. In fact if he is tremendously fatigued, the highest rate of production may occur at the start of the job, and the WU may be nonexistent (See Fig. 13.8). A desirable WU (See Fig. 13.5), is achieved when the worker is vitally interested in his work and when incentives for high production are present.

(text and figures from Irma H. Gross and Elizabeth W. Crandall *Home Management: In Theory and Practice*)

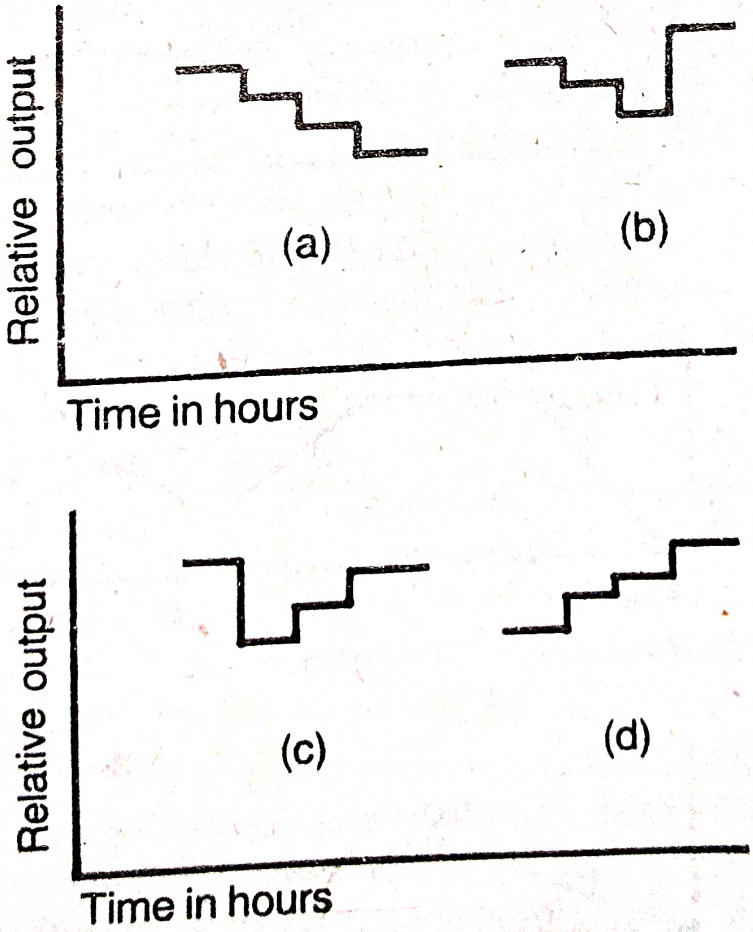

Fig. 13.1 Types of Work Curves

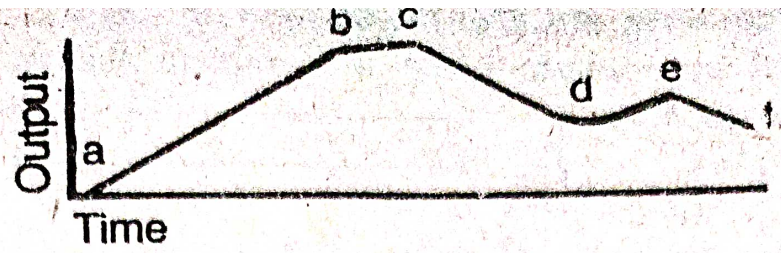

Fig. 13.7 Work Curve with slow warming up period

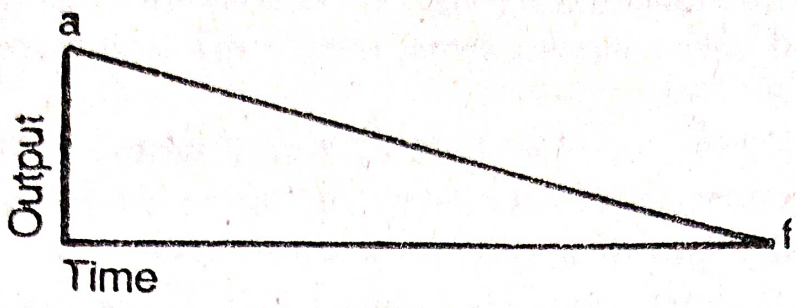

Fig. 13.8 Work Curve of extremely fatigued worker

TASKS

I. Read paragraphs 1 and 2 and attempt the following:

a. The reasons for the occurrence of accidents are:

i. _____ (Physiological)

ii. _____ (Psychological)

b. Indicate the levels of the accident rate during:

i. the day shift: late morning, midday, end of day

ii. the night shift: midnight, early morning, morning

c. Select appropriate phrase/phrases from list A given below, which convey the meaning of the abbreviations and symbols in list B.

List A: therefore, at the rate of, is the cause of, is equal to, results in, is greater than, hence, or, percent, is less than, leads to, that is, results from, affects, and, since, is derived from, because, is affected by, is caused by, because of.

List B: @, =, ∴, ∵, ←, →, >, <, %, i.e., /.

d. Reduce the following sentences to note form using the abbreviations and symbols in list B.

A longer work period leads to a higher accident rate.

The number of accidents in a twelve-hour work period is therefore greater than the number in a ten-hour day.

e. Some verbs are always followed by certain prepositions. Find appropriate verbs to complete the following:

The quantity / of work _____ by the work.

The quantity / of work _____ of curve

II. *Work in pairs:*

Study how the description of the work curves in paragraphs 4 to 6 is presented visually in Figures 13.1 and 13.2. Read paragraphs 7 and 8; identify and label the next three figures from the description provided.

III. *Work in pairs:*

Study figures 13.6, 13.7, 13.8 and write a brief description of each. On completion of the task, you may refer to paragraphs 9 to 12.

UNIT 16

Common Frog (Rana Temporaria) — Breeding Habits

Breeds in late winter and early spring, February-April according to temperature, in shallow water. Each female lays up to 4,000 eggs in a jelly mass. Eggs hatch at end of two weeks, tadpoles have oval body and short tail, black or dark brown, breathe by gills and eat water plants. Tadpoles are flesh-eating. Hind-limbs appear in 5 weeks, fore-limbs at first hidden under skin break through later. Gills lost and breathes by lungs at 3 weeks. Change to froglets in about 3 months (June-July).

Starts to breed at 4 years old.

Hibernates October to February or March, in damp earth or in mud at bottom of ponds.

Lives up to 12 years.

(from Maurice Burton, D.Sc. *Reptiles and Amphibians*)

TASK

Rewrite the passage by filling in necessary details. Use some or all of the words given below for establishing links between sentences. Re-arrange sentences where necessary.

they, these, the, then, next, by then, after, at first, later, besides, although, it, during, when, while, if, among.

UNIT 17

The House Fly

i. Although flies do not play any part in the life-cycle of disease-causing organisms, they are one of the primary vectors of intestinal parasites, especially the bacteria of typhoid, cholera and dysentery, and the amoeba which causes amoebic dysentery. The main offenders are the house-fly (musca), the meat fly (sarcophaga), the bluebottles (calliphora) and fruit flies (drosophila).

ii. Flies feed on solid food by covering the surface with digestive enzymes secreted through the mouthparts, and then sucking up the digested food through the proboscis. This liquid may be regurgitated as vomit spots. The food is also contaminated by the flies' excreta and by organisms carried on the hairs on the body and legs. As flies visit human faeces, manure heaps and rotting organic matter in general, their mode of feeding and the hairs on the surface make them ideal vectors for intestinal organisms.

iii. Flies are potentially excellent carriers of bacteria for three main reasons:—

a. The bodies are hairy, so hold bacteria on their surface.

b. They lay their eggs on organic matter which will ferment to produce heat necessary for the development of the egg. Such organic matter will include forms of refuse and faeces.

c. The adults feed on human food.

Flies are potentially excellent carriers of bacteria which invade the intestine, e.g. typhoid and cholera.

iv. *Life history of the house fly* (The life histories of the other flies are similar). The eggs are laid in small groups in rotting organic matter which provides the necessary warmth and humidity for their development. They hatch in about 8 hours to produce

white legless larvae (maggots). These feed on the organic matter as they burrow into it. They moult twice, finally forming a pupa inside the last larval skin (puparium). Within this the fly develops into an adult, emerging from the pupa after 3 days. All flies have two wings, in contrast to other winged insects, which have four.

v. *Control of fly-disseminated diseases*:
   a. Food should be covered.
   b. Manure and compost should be kept far from houses.
   c. Proper sanitation.
   d. Dustbins should be covered.
   e. Town refuse should be burnt.
   f. Insecticidal sprays can be used, but only with caution. Insecticides on foods may have effects on human beings as yet unknown.

(from George Usher *Human and Social Biology*)

TASKS

I. Name the topics covered in i and ii.
II. Rewrite the information in iii and v in the form of a paragraph.
III. Prepare a plan for a short documentary film on flies as carriers of disease. Describe:
   a. The visuals you would use.
   b. The commentary/dialogue/music, etc. that would accompany the visuals.

   Decide whether the tone of the film is to be informative/humorous/horrifying, etc. and adapt the language accordingly.

UNIT 18

The Life-cycle of a Mosquito

There are four stages in the life-cycle of a mosquito: the egg; the larva, often called wiggler or wiggletail; the pupa or tumbler; and the adult winged insect or imago. The eggs are matured in batches of 50 or less to 200 or more and several such batches may be laid by one female. When ovipositing, some species glue them together into a raft or boat-shaped mass, which floats on water. Other species deposit the eggs singly on the water, and still others oviposit on the soil at the edge of the water or in moist depressions. The incubation period is short in warm weather, but in certain species the eggs are able to withstand long periods of drying.

The larvae of all mosquitoes are aquatic and most of them are free swimming. Although possessing tracheal gills the larvae of most species must come to the surface for air, and an elongated air tube or other modified apparatus is provided for obtaining air through the surface film. During the period of development which lasts 4 to 10 days, the larval skin is shed four times, each successive instar showing a progressive increase in size. The first two instars are very small and are easily recognized as immature. In the third instar the hairs have fewer branches than in the fourth instar, and the sclerotization of the anal segment is less complete.

The food of mosquito larvae consists of minute plants and animals and fragments of organic debris, which the larvae strain from the water by the action of the mouth parts. It has been concluded that the presence of living food organisms was necessary for any considerable growth.

With the fourth moult the pupa appears. The pupal stage is also aquatic and is a period of marked transformation, during

which the adult is formed. The imago usually emerges after about 2 days.

The length of life of adult mosquitoes under natural conditions is difficult to determine, but for most of the southern species it is probably only a few weeks during the summer months. Some of the northern species live much longer.

(from Arnold Mallis *Handbook of Pest Control*)

TASK

Rewrite in note form, the four stages in the life-cycle of a mosquito.

e.g. Title: Life-cycle of a Mosquito

Stage 1: *Egg*

Several batches of 50 to 200 per female.

Laid: .....

Incubation period: ....

However.....

(Similarly Stages 2, 3 and 4.)

UNIT 19

A Leaf for Livelihood

1. Beedi leaf is available mostly in Central India. It is predominantly grown in Madhya Pradesh, Maharashtra, Orissa, Andhra Pradesh and Gujarat.

2. The 'beedi' leaf-bearing tree is a medium-sized tree. The usefulness of the tree is that its leaf can serve as a wrapping material for beedies, the poor man's cigarette.

3. There is a lot of *employment* potential in such things as plucking the leaves, curing them and rolling the leaf into beedies. Annually about 3,00,000 tonnes of the leaf are plucked and converted into beedies.

4. Though there are no *statistics* of the exact level of employment rough estimates put it between 1.5 to 2 millions: mostly poor women and children of rural India.

5. In most States, the sale of the leaf generates substantial *revenue* to the exchequer. In view of its importance, the trade of plucking and marketing the leaf was *nationalised* in 1971.

6. In Andhra Pradesh, the tree occurs mainly in the ten districts of Telengana. Good quality leaf is available in the Godavari Valley, especially in parts of Adilabad, Karimnagar, Warangal and Khammam districts.

7. State trading is on these lines. Some villages, including reserve forests, *are constituted* as a unit, and the government calls for tenders to purchase leaf from such notified units.

8. Exactly 100 leaves will make one standard bundle, locally (in Andhra Pradesh) known as 'Katta' and 1,000 such 'kattas' make one standard bag.

9. The purchaser of the leaf will give his tender rate for the standard bag, and he is expected to purchase the entire quantity of the leaf collected by the government from that unit.

10. The government on its part, will collect the leaf through an agent and deliver it to the purchaser. The bundles are collected by the agent, who pays the collection charges which vary from 5 to 7 paise per bundle of 100 leaves.

11. The labourers go to the forest, collect the leaves, tie them into bundles of 100, and sell them to the agent the same day. The bundles thus collected are kept in the open for about 8 to 10 days to dry. They are loosened and turned at intervals so that all the leaves get sunlight and 'cure' well.

12. After the curing, the bundles are put into bags and transported to godowns or marketing centres. This is how the leaf finds its way from the tree-top to the market.

13. The season of 'beedi' leaves is from March to May. In March the trees, bushes etc. of this species are pollarded so that the new shoots will produce good leaf. Approximately 40 days after pollarding, the collection will start. Generally it will be from mid-April to the last week of May.

14. The loading of the bundles into the bags and the *transportation* (mostly by carts) will take another two weeks.

15. In all these operations the labour will get some work or other from March to the first week of June, 60 to 70 days during the season. It is common in rural Telengana to see the poor labour eagerly wait for the *commencement* of the season so that they can get some wages to clear their debts.

16. One of the aims of nationalisation of this trade was to give reasonable wages to the labour. There is no doubt that the labour has *benefited* from the nationalisation, which has resulted in better and prompt wages; the middleman who was exploiting the labour was eliminated.

17. Nevertheless there is a general feeling that the wages when compared to the nature of work, are less. The people engaged in the collection and curing of the 'beedi' leaves are generally women and children from scheduled castes, scheduled tribes and backward classes.

(from *The Hindu*, Sunday, December 9, 1979)

TASKS

I. The words italicised in the passage belong to the context of trade and commerce. Find a suitable replacement for each word and list other words from the passage which belong to the same context.

II. Write a short description of the different uses of forests. Use appropriate introductory and concluding sentences, as well as appropriate phrases to lead from one paragraph to the next.

III. a. From your reading of the text, complete the following:

1. Beedi leaf is cultivated in .....
2. ..... grows a better quality of beedi leaf.
3. Preparation of beedies involves various types of work: ..... which is mainly done by .... and .....
4. The beedi leaf trade was nationalised in .....
5. The government operates through each unit which is made up of ..... and .....
6. It invites quotations for the sale of all the tobacco in one unit which is packed in .....
7. The marketing procedure is as follows:
   the labourer .....
   the agent .....
   the government .....
   the purchaser .....
8. The purpose of nationalisation .....

b. Rewrite the above sentences in the form of a paragraph.

IV. *Group Work*:

Prepare a plan for a poster, drawing attention to exploitation of women labourers. Describe:

a. The visual/visuals that you will use, providing details of colour, materials, expressions, positioning of visuals, etc.

b. The caption/captions that go with the visuals, giving reasons for your choice of words.

UNIT 20

Leonardo da Vinci—I

TASKS

I. Complete the passage by filling in appropriate function words from
   a. the options provided.
   b. the following list: than, from, he, to, of, for, but, through, over, by, in.

Leonardo was born near Florence and sent at an early age to be trained in the studio of Andrea del Verrocchio. The breadth ———— Leonardo's Renaissance mind ranged———— engineering problems ———— botanical study, and his notebooks are famous as records ———— a many-sided genius. 'The Madonna of the Rocks' reveals not only his interest ———— anatomy, geology, and botany, qualities that fore-cast the sixteenth century, a conscious effort to perfect nature ————concepts of ideal form and a desire to go beyond surface appearances to express the working of the mind or a condition ———— the spirit. While Leonardo was not unprecedented in these concerns,————faced them more deliberately ———— his contemporaries did and went further in seeking pictorial means ———— their expres-sion. Sixteenth century painting was influenced———— his triangular figure grouping and his ideal facial type, the softly modelled oval with slender nose and delicately curved mouth. Unlike————(more, most, much) fifteenth-century painters, he no longer felt the need for clarity in all parts. In 'The Madonna of the Rocks' (Louvre version), he subordinated local parts of the painting in obscurity by providing powerful focus. The high-

lighted fingers of the Madonna's outstretched hand create a startling illusion ———— (of, off, in) depth; they hover ————the head of Jesus and suggest a halo or a crown of thorns. The angel's hand points———— the other child, who will become John the Baptist and recognize Jesus as the Christ. The tense concentration———— attention———— (among, between, amidst) the two children is softened by the meditative gaze of the Madonna, while the angel seems more aware ———— the spectator. The jagged rocks and delicate plants do not seem to be included merely to demonstrate technical virtuosity ———— (nor, or, either) to establish physical reality, as they do in much fifteenth century work. Instead, the powerful contrasts of light with shadow, of wild nature with soft flesh create the dramatic intensity of a mystery, play or a sacred ritual. From 1483 until 1500, Leonardo worked in Milan for the Sforza family, and painted in addition———— 'The Madonna of the Rocks', 'The Last Supper' in S. Maria della Grazie, where again the composition is expressive of mental drama. In Florence once more from 1503 ———— (towards, to, then) 1506, he painted the 'Mona Lisa' (Louvre, Paris). After a trip to Rome in 1513 and more time in Milan, he accepted the invitation of Francis I to come to Amboise in France, where he died. The variety of Leonardo's interests and his tendency to leave projects unfinished have left us few paintings. His drawings and notebooks contain anatomical and botanical studies and inventions ranging ———— hydraulic engineering ———— flying machines. His late painting of 'John the Baptist' (Louvre, Paris) has decided Manneristic traits and influenced the Mannerist painter Parmiganino.

(from Dale G. Cleaver *Art, an Introduction*)

Leonardo da Vinci—II

The art of Leonardo da Vinci (1452-1519) was founded upon the shop traditions of the Quattrocento. It was his mastery of the manifold technical and theoretical artistic problems which made

him able to create a new style and form. His ideas were as applicable to science and philosophy as they were to art. He was able to discover or to invent a new type of beauty, perceivable in his own time as well as in terms of the past and of subsequent periods. His multiplicity of accomplishment in the fields of painting, sculpture, engineerng, mathematics, hydraulics, aeronautics, anatomy ballistics, inventing and writing gave his works a universality which those of the earlier experimenters did not possess, and his imitators were able to produce works only superficially resembling the conceptions of the originator.

Curiously enough, in spite of the undeniable intellectuality and spirituality of Leonardo's theories, he is the best known of all painters. The subtle portrait of the 'Mona Lisa' and 'The Last Supper' are his most popular paintings. But his unfinished works, like the 'Adoration of the Magi' and 'St. Jerome', as well as his thousands of sketches account for much influence on the works of his followers, in his own time as well as in the present. 'The Last Supper' synthesised all the artistic problems in the art of painting, despite the fact that his unsuccessful experimentation with the medium caused the picture to deteriorate even as he worked on it. In the dramatic treatment of subject, it forecasts the developments of later ages and remains the most inspiring religious expression of the Renaissance. In Leonardo's handling of the complex problems of composition, surface design, individual characterization, interior and exterior space, and psychological understanding of content, he has never been equalled. The emotional impact of his work is unique and probably accounts for the strong hold his fame still retains in the imaginations of men. In Leonardo were combined the best of the past and the dreams for the future.

(from Jean Anne Vincent *History of Art*)

Leonardo da Vinci—III

Leonardo was commissioned by Duke Ludovico to paint a picture of the Last Supper on the wall of a new dining room in the monastery—the church of Santa Maria della Grazia.

As Leonardo composed the picture of the Last Supper in his mind, he wrote a detailed description of it in his notebook. He decided to paint the dramatic moment when Christ said to his 12 disciples, "One of you shall betray me". He made a sketch of the scene. Jesus is seated with eleven of his disciples at the far side of a long table. The traitor, Judas, is sitting alone at the near side. This composition was used by all Italian painters, but it did not seem to satisfy Leonardo. He decided to seat Judas among the other disciples and show by his expression and gestures that he was the betrayer of Christ.

The painting has not remained intact. Dampness began to seep in through the monastery walls. The artist could see that the plaster on which he had painted his great picture was peeling away. A beautiful shadow in faded colours is all that remains of Leonardo's masterpiece.

(from Elizabeth Ripley *Leonardo da Vinci—A Biography*)

Leonardo da Vinci—IV

Leonardo da Vinci's Last Supper is a masterpiece of monumental composition. The group is located in a rather tight space; mighty figures crowd around the table; if they were to stand up there would not be room enough for them. This illustrates for the first time one of the principles of the classic composition: the super-proportions of the figures in relation to space. The correct perspective of the setting is still maintained; the apparent continuation of the refractory required a clearly comprehensible and unambiguous space construction. This is achieved by the use of the apparently simple but expert demarcations of coffered ceiling; tapestry-hung walls and background windows. Within this space the over-life-sized figures take their places; their presence seems to demand more space than there actually is. This space-creating force which pervades their movements is one of the secret causes of the monumental effect of the picture. We shall see how far Leonardo himself developed this principle of "superdimensions" in his subsequent compositions, the St. Anne and the Battle of

Anghiari. Through Leonardo it became from then on, a formal principle of the classic High Renaissance style; Raphael makes use of it; as well as Michelangelo, who in his Sistine ceiling develops the conscious imprisonment of colossal forms in a tight space ad extremum.

The grouping of the Apostles serves not only to convey the content of the picture, but also to create a carefully conceived rhythmic movement of forms. The scene as a whole projects a transitory moment of rest between two phases of movement; for an instant the disciples are petrified with shock and excitement, a state which will immediately give way to fluid motion.

The gradation of motion and emotion, of gesture and expression; the harmonious grouping of complementary and contrasting character types: all this creates a unity of formal values and subject matter that justifies the undying fame of the work, notwithstanding its present ruined condition. It is the first pictorial monument of the classic High Renaissance, and one of the most perfect creations of any period.

(from Ludwig H. Heydenreich *Leonardo da Vinci*)

II. a. Prepare a bibliography on Leonardo da Vinci.
b. Select one book and collect information on Leonardo, the painter, and prepare a list of his portrait paintings.

III. The main topics in Passage I are as follows:
— Biographical account of Leonardo da Vinci.
— Description of "The Madonna of the Rocks".
— His contribution to the painting of his time.
Identify the main topics in Passage II.

IV. The description of "The Madonna of the Rocks" provided in Passage I is presented in note form below:

A	B
Visual Presentation — Details	*Technical Virtuosity*
— outstretched hand	— local parts of painting subordinated in obscurity
— fingers hover over the head of Jesus	— powerful focus provided

— angel's hand points to the other child.	— startling illusion of depth
— meditative gaze of the Madonna	— tense concentration of attention softened by meditative gaze
— jagged rocks	— powerful contrasts of light & shadow, wild nature & soft flesh
— delicate plants	— dramatic intensity of a mystery play or a sacred ritual

On similar lines, present information on Leonardo da Vinci's painting "The Last Supper" in note form; refer to Passages II, III & IV.