Unit - IV Premium ①

...um is a amount paid periodically to the ... by the insured for covering the risk. Premium ...o be paid in a lump sum amount at a premium. Premium is a main source of income ...u insurance company. Basically the premium depend ...pon the sum assured & the type of insurance plan ...en. premiums can also be referred as the ... of insurance plan that is purchased by the ...dividual. Premium is a name given to the consideration ...al the policy holder has to pay in order to secur...e benefits offered by the insurance contract.

... calculation of the premium is a complex technical ...lem involving actuarial and statistical principles. ...bles of premium rates for each plan of insurance ...re made available by the insurance companies ...for a use of agents who are required to ...

On the basis of an expectation as to how many persons are likely to die within a year in a age group. This is a expectation which is calculated by the actuaries on the basis of parked experience and made available as mortality tables

(ii) Net premium

The premiums collected by insurance companies every year are not used for the payment of claims for various reasons only the portion of the premium is meant to be meet survival benefit the balance premium are kept aside ~~assigned~~ and will be invested to earn some interest. The Premium worked out after taking into account the interest likely to be earned is called net premium (or) Pure premium.

(i) Level Premiums

The Level premiums is a amount which is fixed for the entire period of the policy term. If the total policy term is for 20 years then the same premium amount is fixed for the entire term of the policy

level premiums are charged by ③
for two main reasons

(i) the Risk profile of an investor increases in the later years and the cost of risk to life will be high. So this would be challenging and could trigger default in payment of premiums as it would not be affordable to pay a such a high premium. Also the insurance company would have some administrative difficulties in the change of the premiums. Hence the insurance company spreads the risk evenly for the whole time period and charges level premium

(ii) Adverse Selection: If a high premium amount is charged in later years would result in most of the healthy people quitting the plan. People who suffer from various diseases would be ready to continue the plan to receive the benifit. this will lead to adverse selection. This will affect the calculations of the insurance companies based on mortality tables

M
(v) office premums: office premium.

The major expenses of an insurance company incures is commission salaries to employee's in additional to other expenses like rent additional -ity and other administration expenses there

are known as office expenses. The level premium figure arrived after loading the net premium on pure premium is called office premium. The premium figure printed in the promotional Brochure ~~Brochures~~ are office premium. They are also referred as tabular premium. The risk of death is more in a policy with the long term than with the short term. Because of the practise of level premium the tabular premium is charged would be lesser for long term policy than for the short term policy. On ~~Aggregate~~ Aggregate the total premium would be higher in the longer term plan than the short term plan. ~~If the mode of~~

If the mode of premium is nearly the Insurer can utilize the amount for the entire year and earn more interest than the premiums paid in installment. Therefore the premium rates would slightly increase depending upon the mode of payment

Some insurers provide increases or additional amount in premium for quaterly or monthly but no adjustment for yearly mode.

4. Expression for Office Premiums.

The office premiums is obtained from the following relationship :

Value of Office Premiums = Value of Benefits + Value of Expenses

We now obtain general expression for office annual premiums, P^1, to provide for the following expense loadings :

(a) First year (initial) expenses : I_1 per unit of premium and I_2 per unit of sum assured.

(b) Renewal expenses relating to second and subsequent policy years : K_1 per unit of premiums and K_2 per unit of sum assured ($I_1 > K_1$ and $I_2 > K_2$).

In case of Whole Life Assurance for sum assured of S to a person aged x at entry, the expression for office annual premium, P^1, is given by

$$P^1 \ddot{a}_x = S.A_x + I_1 P^1 + I_2.S + K_1.P^1 a_x + K_2.Sa_x$$

$$= S.A_x + (I_1 - K_1) P^1 + K_1 P^1 \ddot{a}_x + (I_2 - K_2) S + K_2.S\ddot{a}_x$$

$$\therefore \quad P^1 \{ \ddot{a}_x - (I_1 - K_1) - K_1 \ddot{a}_x \}$$

$$= S.A_x + (I_2 - K_2) S + K_2.S\ddot{a}_x$$

$$\therefore \quad P^1 = \frac{SA_x + (I_2 - K_2) S + K_2.S\ddot{a}_x}{\ddot{a}_x - (I_1 - K_1) - K_1 \ddot{a}_x} \qquad \qquad \ldots (14.1)$$

aged x at entry and term of n years, the expression for office annual premium is

$$P^1 = \frac{S.A_{x\,\overline{n}|} + (I_2 - K_2)\,S + K_2.S\bar{a}_{x\,\overline{n}|}}{\bar{a}_{x\,\overline{n}|} - (I_1 - K_1) - K_1\bar{a}_{x\,\overline{n}|}} \qquad \ldots (14.3)$$

$$= \frac{S.P_{x\,\overline{n}|} + \dfrac{(I_2 - K_2)S}{\bar{a}_{x\,\overline{n}|}} + K_2 S}{1 - \dfrac{(I_1 - K_1)}{\bar{a}_{x\,\overline{n}|}} - K_1} \qquad \ldots (14.4)$$

Office premium ⑦

With and without profit premiums:

With the phenomenal advances in medical science there has been a continuous improvement in mortality. The premiums were calculated on the basis of the past experiences. Hence the insurer earns a handsome profit. These profit tempted the insurer to offer the share with the policy holder and encourage them to go for more insurance. This leads to the profit sharing in the insurance industry. To satisfy the wishes of profit minded business people regular provision in the premium began to be made for definite scales of profits to be declared as bonus.

Such premiums with definite ~~scales of profit~~ ~~progression~~ provision for participation in the profits of the insurer are known as with profit premium.

Bonus an generally declared in our country as additions to sum assured for each years premium paid. The cost of bonus at the particular age is much less at young ages and for policies with short unexpired terms.

Rate of bonus provided is b

$b(IA)_x \div \ddot{a}_x$ = Sum assured per addition for bonuses in each premium

Thus, b given the addition to each premium for an anticipated annual rate of bonus b per unit sum assured. This addition for definite bonus is called bonus loading in the premium

The expression for office premium (annual) for with profit whole life insurance is

$$P' = \frac{S n_x + S b (IA)_x + (I_2 - k_2)S + k_2 S \ddot{a}_x}{\ddot{a}_x - (I_1 - k_1) - k_1 \ddot{a}_x}$$

In case of with profit Endowment assurance

$$P' = \frac{SA_{x:\overline{n}|} + SbIA_{x:\overline{n}|} + (I_2 - k_2)S + k_2 S \ddot{a}_{x:\overline{n}|}}{\ddot{a}_{x:\overline{n}|}(I_1 - k_1) - k_1 \ddot{a}_{x:\overline{n}|}}$$

It is clear that the payment of with profit Premium enntles the life assured only to participate in the profit of the insurer

If there are no profits in the particular period because of unfavourable situation the life assured have no right to demand any bonus At the time of prosperity when the good profits are earned there is every possibility to get the profit.

The contribution of various sources of profit to the workings of insurer is analyzed as (i) mortality experience (ii) interest experience (iii) expenses experience

Under above circumstances the insurer will incure losses and under opposite circumstances the insurer will make profit i) margins in premium:

A constant addition to the premium is made to meet any unexpected circumstances under normal conditions there will be no need for utilizing these margins

without profit policy holder have no right to share the profit of the insurer but margins are provided in non profit premiums when normal conditions prevail and when margins are not used up will increase the profit of the insurer All these profit are distributed among with profit policy holders

with profit policy holders are having privilege of sharing in the profit contributed by others. on the other hand they have the responsibility of sharing in the losses of the insurer

The expressions for without profit plans with C per unit sum assured

Whole life assurance

$$P' = \frac{S A_x + (I_2 - k_2 + c) s + k_2 S \ddot{a}_x}{\ddot{a}_x - (I_1 - k_1) - k_1 \ddot{a}_x}$$

for Endowment assurance

$$P' = \frac{S A_{x:\overline{n}|} + (I_2 - k_2 + c) s + k_2 S \ddot{a}_{x:\overline{n}|}}{\ddot{a}_{x:\overline{n}|} - (I_1 - k_1) - k_1 \ddot{a}_{x:\overline{n}|}}$$

Adequacy of premiums

When an insurer requires premium rates was start the business of insurance, he does not have his ow experience. premiums have therefore to be calculated assuming

(1) mortality rates of a standard table which reflect mortality of persons insure

(11) Rate of interest which is likely to earn depending upon current market

(iii) Expenses which should be taken into account

6. **Adequacy of Premiums** : When an insurer requires premium rates for starting the business of insurance, he does not have his own experience. Premiums have therefore to be calculated assuming : (1) mortality rates of a standard table already prepared which may reasonably reflect the mortality of persons who are likely to be insured, (2) rate of interest which it is likely to earn depending upon current market conditions and (3) expenses which should take into account the proposed method of its working.

While preparing the table of premium rates, assumptions have necessarily to be made. The profitable working of the insurer depends upon the adequacy or sufficiency of the premium rates and his ability to manage the business well. Premiums are said to be adequate if actual experience regarding mortality, interest and expenses follows reasonably close to the assumptions made in their calculations.

There can never be an exact identity between actuals and assumptions. But variation should be within reasonable limits. If the variations are very wide there is a case for revision of premiums. Revision is essential when the variation is unfavourable and premiums charged are lower than are actually required on the basis of actual experience.

But when variation is favourable to the insurer and he is charging higher premiums than are required on experience basis, it is not the usual practice to make a downward revision of premium rates. This of course depends upon the actual circumstances of the case. If a major portion of insurer's business is on with profit basis, the favourable experience may generate a higher rate of a bonus to policy holders than originally contemplated. If, on the other hand, the bulk of policyholders are holders of non-profit policies, it will be unfair to charge heavier rates of premiums than are required as they cannot have any share in the profits of the insurer and the premium rates may have to be reduced.

If the variations are very wide, a revision is always necessary even though it may be favourable for the simple reason that cost of insurance should not be unusually heavy and beyond the reach of the common man.

It is, therefore, necessary to make a periodical comparison of the

actual experience with the expectation and no time should be lost in revising the premiums if their adequacy is upset. This test for adequacy is more important in insurance business as the real effect of inadequacy cannot become apparent as long as the fund is increasing. Insurance contracts are essentially long term contracts involving accumulation of funds which always increase with increasing flow of business and may make a lay man believe that increasing funds are always an indication of the growth and prosperity of the insurer. It is unfortunately not the increase that is the index of prosperity but it is the rate of increase that gives the real position of the insurer. If the rate of increase is not as anticipated and if the premiums are not adequate, then in spite of increasing funds the insurer may be heading towards a disaster.