

Solutions: Case 2 (Urvashi)

Q1 C) Code of Ethics of Confidentiality

Q2 B) To collect the quantitative and qualitative information of Urvashi

Q3 D) Rs. 60,703

(Solution given below)

Current value of the desired house

12,500,000 Rs.

Expected value of house after 3 years considering 7% appreciation

15,099,370 Rs.

$12500000 * (1+6.5\%)^3$

Amount of loan to be availed

10,569,559 Rs.

$15099370 * 70\%$

Tenure of loan = (Urvashi's retirement age - age when loan availed)

18 years

55-37

Rate of interest on housing loan

8.50% p.a.

EMI on the housing loan

95,703 Rs.

$PMT(8.5\%/12, 18 * 12, -10569559, 0, 0)$

Current rental outgo

35,000 Rs. p.m.

EMI in excess of current house rent

60,703 Rs. p.m.

95703-35000

Q4 A) Urvashi needs to take cover against disability and critical illness as she is the only earner in the family; other risks are well covered.

Q5 B) Rs. 84 lakh

(Solution given below)

Annual Living expenses required in current terms

900,000 Rs. p.a.

Inflation rate

5.00% p.a.

Return on risk free instruments

7.50% p.a.

Current age of Dhruvi

9 years

No. of years expenses required (till 27 years of age of Dhruvi)

18 years

Corpus required today towards living expense provisioned

13,362,370 Rs.

$PV((1+7.5\%)/(1+5\%)-1, 18, -900000, 0, 1)$

Funds required to purchase a house

10,000,000 Rs.

Total Corpus for living expenses and house

23,362,370 Rs.

13362370+10000000

Current insurance cover

15,000,000 Rs.

Additional insurance cover required

8,362,370 Rs.

23362370-15000000

(Approximate)

Rs. 84 lakh

Q6

D) Rs. 1.45 crore

(Solution given below)

Urvashi's salary gross per annum

3,300,000 Rs.

Tax incidence

750,000 Rs.

Net income in the current year

2,550,000 Rs.

Income contribution to the family (25% self consumption)

1,912,500 Rs.

Remaining work life (retiring at 55, current age 34)

21 years

Investment Yield

8.50% p.a.

expected rate of increase in net contribution

5.00% p.a.

Present value of future income

29,508,239 PV

Sum Assured under current term insurance

15,000,000 Rs.

Shortfall in insurance cover

14,508,239 Rs.

(Approximate)

Rs. 1.45 crore

 $3300000 - 750000$ $2550000 * (1 - 25\%)$ $PV((1 + 8.5\%)/(1 + 5\%)^{-1, 21, -1912500, 0, 1})$ $29508239 - 15000000$

Q7

A) 22% curtailment

(Solution given below)

Urvashi's current Age

34 yrs

Urvashi's retirement Age

55 yrs

Urvashi's Life expectancy

85 yrs

Current expenses for heads considered for retirement

840,000 Rs. p.a.

Inflation expected pre-retirement

5.00% p.a.

Expenses estimated at retirement

2,340,209 Rs. p.a.

 $840000 * (1 + 5\%)^{(55 - 34)}$ Retirement corpus calculated in the 1st calculation:

Rate of return expected

7.50% p.a.

Inflation expected post-retirement

5.00% p.a.

Period for which money would be needed in first calculation

30 yrs

85-55

Retirement corpus

50,952,803 Rs.

 $PV((1 + 7.5\%)/(1 + 5\%)^{-1, 30, -2340209, 0, 1})$ Retirement corpus calculated in the 2nd calculation:

Rate of return expected

6.50% p.a.

Inflation expected post-retirement

5.00% p.a.

Period for which money would be needed in 2nd calculation

35 yrs

85-55+5

Retirement corpus

65,019,662 Rs.

 $PV((1 + 6.5\%)/(1 + 5\%)^{-1, 35, -2340209, 0, 1})$

Curtailment of expenses required on retirement

22%

 $1 - (50952803 / 65019662)$

Q8

C) Rs. 29,310

(Solution given below)

Current expenses for heads considered for retirement

840,000 Rs. p.a.

Inflation expected throughout

5.00% p.a.

Urvashi's working years (retirement at 55, current age 34)

21 yrs

Living expenses needed on retirement (60% of pre-retirement)

1,404,125 Rs. p.a. $840000*60%*(1+5\%)^{21}$

No. of years retirement income stream required (up to age 85)

30 yrs

Yield of designated retirement fund post retirement

6.50% p.a.

Retirement Corpus estimation:

Required Corpus for living expenses at age 55 years

34,551,813 Rs. PV:1 $PV((1+6.5\%)/(1+5\%)-1,30,-1404125,0,1)$

Rs. 1 crore (gifts) provisioned in the corpus needed 20 years later

2,837,970 Rs. PV:2 $10000000/(1+6.5\%)^{20}$

Rs. 1 crore (charity) provisioned in the corpus needed 30 years later

1,511,861 Rs. PV:3 $10000000/(1+6.5\%)^{30}$

Total Corpus needed to be accumulated

38,901,644 Rs. (PV:1) $34551813+2837970+1511861$

Suppose, a total monthly amount of Rs. 100 is invested in the asset allocation of equity and debt components cumulatively

Accumulation to meet the Retirement Corpus:

Demat account Equity Shares: Current balance

2,392,000 Rs.

Accumulation in 16 years (5 years to retirement)

12,703,659 Rs. $2392000*(1+11\%)^{16}$

Accumulation of this up to retirement (next 5 years) in 6.5% yield fund

17,405,114 Rs. $12703659*(1+6.5\%)^5$

Balance to be accumulated through Asset Allocation and Designated Fund

21,496,530 Rs. $38901644-17405114$ First Ten years : Asset Allocation

Equity Returns

11.00% p.a.

Debt returns

7.50% p.a.

Equity investment per month

70 Rs. p.m.

Debt investment per month

30 Rs. p.m.

Equity component accumulation in 10 years

14,870 Rs. $FV((1+11\%)^{(1/12)}-1,10*12,-70,0,1)$

Debt component accumulation in 10 years

5,298 Rs. $FV((1+7.5\%)^{(1/12)}-1,10*12,-30,0,1)$

Total accumulation in asset allocation after 5 years

20,168 Rs. $5538+2148$ Next Six years : Rebalanced Asset Allocation

Rebalanced Equity component accumulated (40%)

8,067 Rs. $20168*40/100$

Rebalanced Debt component accumulated (60%)

12,101 Rs. $20168*60/100$

Revised Equity investment per month

40 Rs. p.m.

Revised Debt investment per month

60 Rs. p.m.

Equity component accumulation in total 16 years

19,110 Rs. $FV((1+11\%)^{(1/12)}-1,6*12,-40,-8067,1)$

Debt component accumulation in total 16 years

24,100 Rs. $FV((1+7.5\%)^{(1/12)}-1,6*12,-60,-12101,1)$

Total accumulation in asset allocation (in 16 yrs)

43,210 Rs. $19110+24100$ Last Five years : 6.5% p.a. Yield Retirement Fund

Monthly investment (doubled)

200 Rs. p.m.

Investment accumulated up to retirement

73,342 Rs. $FV((1+6.5\%)^{(1/12)}-1,5*12,-200,-43210,1)$

Actual monthly investment equivalent to Rs. 100

29,310 Rs. $(21496530/73342)*100$

Q9

A) The principal amount is protected on maturity, and is repaid inflation adjusted. The annual coupons would be 1.5% of such periodically adjusted principal amount in tune with inflation index.

Q10

A) 11% p.a.

(Solution given below)

Current cost of world tour vacation

1,000,000 Rs.

Cost escalation for such vacation

5.00% p.a.

Vacation fund required when due in 10 years

1,628,895 Rs.

 $1000000*(1+5\%)^{10}$

Expected date when vacation fund is to be utilized

1-Apr-2026

Date of switch from the asset allocation fund to risk free instruments

1-Apr-2023

Rate of return from risk free instruments

5.50% p.a.

Required value in asset allocation fund before switch to risk free (3 years prior)

1,387,189 Rs.

 $1628895/(1+5.5\%)^3$

This is to be accumulated until 1-Apr-2023 by investing Rs. 1.05 lakh in 6 installments on 1-Apr-2016, 1-May-2016, --- --- ---, 1-Sep-2016.

The return to be obtained in asset allocation fund is calculated by finding *xirr*

1-Apr-17

-112,606

 $100000*(1+7.75\%/4)^{((365+198)/91)}$

1-May-17

-113,153

 $100000*(1+7.75\%/4)^{((365+221)/91)}$

1-Jun-17

-113,727

 $100000*(1+7.75\%/4)^{((365+245)/91)}$

1-Jul-17

-114,280

 $100000*(1+7.75\%/4)^{((365+268)/91)}$

1-Aug-17

-114,860

 $100000*(1+7.75\%/4)^{((365+292)/91)}$

1-Sep-17

-115,443

 $100000*(1+7.75\%/4)^{((365+316)/91)}$

1-Apr-24

1,387,189

10.96%

XIRR(C125:C131,B125:B131)

(Approximate) 11% p.a.

Q11

B) 28%

(Solution given below)

PPF account is opened on

21-Dec-2009

Initial maturity of PPF account due on

31-Mar-2025

15 years from close of FY in which a/c opened

PPF account balance as on 31-Mar-2017

659,000 Rs.

Amount to be invested on 1st April every year (beginning 1-Apr-2017)

150,000 Rs.

Rate of interest (expected in the long term) on PPF account

7.75% p.a.

Accumulated amount on initial maturity (31-Mar-2025)

2,901,052 Rs.

 $FV(7.75\%,8,-150000,-659000,1)$

Current age of Dhruvi (on 1-Apr-2017)

9 years

Funds for professional course required (on 1-Apr-2030)

22 years

1st extended 5-year term (from 1-Apr-2025 to 31-Mar-2030)

Maturity on 31-Mar-2030 after the 1st extended term with similar investments

5,156,963 Rs.

 $FV(7.75\%,5,-150000,-2901052,1)$

Current cost of professional course

2,500,000 Rs.

Cost escalation for professional course expenses

9% p.a.

Estimated outlay for professional course when due (in 13 years)

7,664,512 Rs.

 $2500000*(1+9\%)^{13}$

A sum equivalent to 50% of required amount withdrawn from PPF account

3,832,256 Rs.

 $7664512/2$

Remaining amount in PPF A/c.

1,324,707 Rs.

5156963-3832256

PPF account extended for 5 more years without further contribution, grows to

1,924,005 Rs.

 $1324707*(1+7.75\%)^5$

Marriage age of Dhruvi (tentatively on 1-Apr-2035)

27 years

Current cost of marriage

2,000,000 Rs.

Cost escalation for marriage expenses

7% p.a.

Estimated outlay for marriage when due (in 18 years)

6,759,865 Rs.

 $2000000*(1+7\%)^{18}$

Funds available as a percentage of marriage cost then

28%

 $(1924005/6759865)*100\%$

Q12

B) Rs. 16,270 per month incremental SIP in Equity MF schemes
(Solution given below)

Escalation of Rs. 1.5 lakh and Rs. 2 lakh expenses (basic education) 10% p.a.
Return from Debt schemes 7.5% p.a.
Return from Equity schemes 11% p.a.

Suryansh's current age is 14 years. The next 3 years expenses will be at current Rs. 2 lakh p.a. (age 15,16,17)

PV of these expenses in debt schemes today 628,342 Rs. $PV\left(\frac{(1+7.5\%)}{(1+10\%)}^{-1,3}, -200000*(1+10\%), 0, 1\right) / (1+7.5\%)$

Dhruvi's current age is 9 years. The next 3 year expenses will be at current Rs. 1.5 lakh p.a. (age 10,11,12)

PV of these expenses in debt schemes today 471,257 Rs. $PV\left(\frac{(1+7.5\%)}{(1+10\%)}^{-1,3}, -150000*(1+10\%), 0, 1\right) / (1+7.5\%)$

Funds required to be in Debt schemes today 1,099,599 Rs. $628342+471257$

Existing funds balance in Debt MF Schemes 579,000 Rs.

Shortfall in funds to be met through switch from Equity schemes 520,599 Rs. $1099599-579000$

Existing funds balance in Equity MF Schemes 1,545,000 Rs.

Remaining in Equity MF schemes after switch 1,024,401 Rs. $1545000-520599$

Existing SIP amount in Equity Schemes 25,000 Rs.

Existing SIP amount in Debt Schemes 15,000 Rs.

Fund accumulation in 4 years in Equity schemes 3,050,877 Rs. $FV\left(\frac{(1+11\%)^{(1/12)}-1}{12}, 48, -25000, -1024401, 1\right)$

Fund accumulation in 4 years in Debt schemes 837,473 Rs. $FV\left(\frac{(1+7.5\%)^{(1/12)}-1}{12}, 48, -15000, 0, 1\right)$

Funds required to be available after 4 years in Debt schemes for Dhruvi's remaining five years basic edcation expenses (age 13,14,15,16,17)

Funds required for age 13 219,615 Rs. $\frac{150000*(1+10\%)^4}{PV\left(\frac{(1+7.5\%)}{(1+10\%)}^{-1, 4}, -200000*(1+10\%)^5, 0, 1\right) / (1+7.5\%)}$

Funds required (PV after 4 years from now) for age 14,15,16,17 1,240,980 Rs.

Total funds required in Debt schemes after 4 years for Dhruvi's basic education expenses 1,460,595 Rs. $219615+1240980$

Shortfall in Debt schemes after 4 years 623,122 Rs. $1460595-837473$

Funds remaining in Equity schemes after effecting switch to Debt after 4 years 2,427,755 Rs. $3050877-623122$

Funds required for Suryansh's higher education after 4 years at cost escalation of 8% p.a. 3,401,222 Rs. $2500000*(1+8\%)^4$

Shortfall in total funds available, which is needed to be accumulated through incremental SIP in Equity schemes 973,468 Rs. $3401222-2427755$

Therefore, incremental SIP in Equity schemes -16,270 $PMT\left(\frac{(1+11\%)^{(1/12)}-1}{12}, 48, 0, 973468, 1\right)$

Q13 A) A) Such a Trust shall protect assets transferred and shall manage them as per guidelines issued to the trustee until either or both of her children reach/es a specified age to be defi

Q14 A) Long term capital gains of Rs. 5,63,486 ; Income from other sources Rs. 26,852

(Solution given below)

| | | | |
|--|-----------|-------|----------------------|
| Purchase cost of jewelry in 2003-04 | 215,000 | Rs. | |
| Sale proceeds in April 2017 | 1,100,000 | Rs. | |
| CII for 2003-04 | 109 | | |
| CII for 2017-18 | 272 | | |
| Indexed cost of acquisition | 536,514 | Rs. | $215000 * (272/109)$ |
| Long-term capital gains | 563,486 | Rs. | $1100000 - 536514$ |
| LTCG Tax @20.6% | 116,078 | Rs. | $563486 * 20.6%$ |
| Net of tax proceeds from sale of jewelry | 983,922 | Rs. | $1100000 - 116078$ |
| Current quoted price of SGB | 2,800 | Rs. | |
| Coupon to be received on bonds (on half-yearly basis in Jun'17 and Dec'17) | 2.50% | p.a. | |
| Discount to issue price | 8.50% | | |
| Face value of SGB | 3,060 | Rs. | $2800 / (1 - 8.5%)$ |
| Number of SGBs to be bought | 351 | units | $983922 / 2800$ |
| interest to be received on bonds during 2017-18 | 26,852 | Rs. | $351 * 3060 * 2.5%$ |

Taxation of these transactions in AY2018-19

Long term capital gains of Rs. 5,62,514 ; Income from other sources Rs. 26,883

| | | | |
|------------|---|-----------|-----|
| Q15 | B) Rs. 7,23,770 (Solution given below) | | |
| | Income under the head salaries: | | |
| | Basic | 2,500,000 | Rs. |
| | HRA | 500,000 | Rs. |
| | Less: exempt (See Note-1) | (170,000) | Rs. |
| | Other allowances | 300,000 | Rs. |
| | Employer's contribution to NPS | 250,000 | Rs. |
| | Employers's Contribution towards NPS [Up to 10% of Basic Salary exempt from tax under Sec 80CCD(2)] | (250,000) | Rs. |
| | Total Income under the head salaries | 3,130,000 | Rs. |
| | <u>Income from other sources</u> | | Rs. |
| | Savings bank account interest (up to Rs. 10000 exempt u/s. 80TTA) | 10,000 | |
| | Fixed deposits interest | 25,000 | Rs. |
| | Income from Sovereign Gold Bonds (See Note-2) | 27,311 | Rs. |
| | Gross total income (GTI) | 3,192,311 | Rs. |
| | Less: Deductions | | |
| | u/s 80CCD(1) contribution NPS Tier-1 by Urvashi, maximum exemption Rs. 1,50,000 | 150,000 | Rs. |
| | u/s 80CCD(1B) contribution NPS Tier-1 by Urvashi, additional benefit up to Rs. 50,000 | 50,000 | Rs. |
| | u/s. 80D (restricted to maximum limit of Rs. 25,000) (c) | 25,000 | Rs. |
| | Total deductions (a + b + c) | 225,000 | Rs. |
| | Net income [GTI - (a + b + c)] | 2,967,311 | Rs. |
| | Tax on net income: | | |
| | up to Rs. 2,50,000 | - | Rs. |
| | Rs. 2,50,001 to Rs. 5,00,000 @ 5% | 12,500 | Rs. |
| | Rs. 5,00,001 to Rs. 10,00,000 @ 20% | 100,000 | Rs. |
| | Rs. 10,00,001 and above @ 30% | 590,193 | Rs. |
| | Tax payable | 702,693 | Rs. |
| | Education cess and Higher education cess (2% + 1%) | 21,081 | Rs. |
| | Total tax payable | 723,774 | Rs. |
| | Rounded off | 723,770 | Rs. |

$$(2500000*10\%)$$

$$2500000+500000-170000+300000+250000-250000$$

$$20000-10000$$

$$357*3060*2.5\%$$

$$3130000+10000+25000+27311$$

$$150000+50000+25000$$

$$3192311-225000$$

$$(500000-250000)*5\%$$

$$(1000000-500000)*20\%$$

$$(2967311-1000000)*30\%$$

$$12500+100000+590193$$

$$702693*3\%$$

$$702693+21081$$

$$\text{ROUND}(464520,-1)$$

Note-1: House Rent Allowance exempted: Least of the following -

| | | | |
|---------------------------|-----------|-----|--------------------------|
| Allowance Received | 500,000 | Rs. | |
| Rent Paid - 10% of salary | 170,000 | Rs. | (35000*12)-(10%*2500000) |
| 50% of salary | 1,250,000 | Rs. | 2500000*50% |

Note-2: Amount to be invested

| | | | |
|--|--------|-------------|---------------|
| Current quoted price of SGB | 2,800 | Rs. | |
| Coupon to be received on bonds (on half-yearly basis in Jun'17 and Dec'17) | 2.50% | p.a. | |
| Discount to issue price | 8.50% | | |
| Face value of SGB | 3,060 | Rs. | 2800/(1-8.5%) |
| Number of SGBs to be bought | 357.14 | units | 983922/2800 |
| | 357 | rounded-off | |
| interest to be received on bonds during 2017-18 | 27,311 | Rs. | 357*3060*2.5% |

