MUTUAL FUNDS

IMPORTANT QUESTIONS

CLASS WORK QUESTIONS

Question 3:

i. Calculation of NAV of the Fund

			(in ₹ Crore)
1.	Value of Shares		
	a. Pharmaceutical Companies	$158 \times \frac{500}{300}$	263.333
	b. Construction Companies	$62 \times \frac{490}{275}$	110.473
	c. Service Sector Companies	$112 \times \frac{500}{285}$	196.491
	d. IT Companies	$68 \times \frac{515}{270}$	129.704
	e. Real Estate Companies	$20 \times \frac{440}{265}$	33.208
2.	Investment in Bonds		
	a. Listed Bonds	$\frac{14}{8.842} \times 24$	38.00
	b. Unlisted Bonds		14.000
3.	Cash and Cash Equivalents		3.00
			788.209
	Less: Expense Payable		7.000
	NAV of the Fund		781.209

ii. NAV of the Fund per Unit

NAV of the Fund	₹ 781.209 crore
Number of Units	8.40 crore
NAV Per Unit (₹ 781.209 crore/ 8.40 crore)	₹ 93.00

iii. Net Return

Initial Cost Per Unit		
Investment in Shares	₹ 420 crore	
Bonds	₹ 38 crore	₹ 458 crore
Number of Units		8.40 crore
Cost Per Unit		₹ 54.52
Return		
Capital Gain	(₹ 93.00 – ₹ 54.52)	₹ 38.48
Dividend	₹ 4x 2	₹ 8.00

		₹ 46.48
Annualised Return	$\frac{46.48}{54.52} \times \frac{1}{4}$	**21.31%**

Question 9:

	Amount in ₹ lakhs	**Amount in ₹ lakhs**	**Amount in ₹ lakhs**
Opening Bank (200 - 185 -12)	3.00		
Add: Proceeds from sale of securities	63.00		
Add: Dividend received	2.00	**68.00**	
Deduct:			
Cost of securities purchased	56.00		
Fund management expenses paid (90% of 8)	7.20		
Capital gains distributed = 80% of (63 – 60)	2.40		
Dividend distributed =80% of 2.00	1.60	**67.20**	
Closing Bank			0.80
Closing market value of portfolio			198.00
			198.80
Less: Arrears of expenses			0.80
Closing Net Assets			**198.00**
Number of units (Lakhs)			20
Closing NAV per unit (198.00/20)			9.90

Rate of Earning (Per Unit)

	Amount
Income received (₹ 2.40 + ₹ 1.60)/20	₹ 0.20
Loss: Loss on disposal (₹ 200 - ₹ 198)/20	₹ 0.10
Net earning	₹ 0.10
Initial investment	₹ 10.00
Rate of earning (monthly)	1%
Rate of earning (Annual)	12%

Question 12:

Scheme	**Investment (₹)**	**Unit Nos. (Investment/NAV at entry date)**	**Unit NAV 31.7.2011 (₹)**	**Total NAV 31.7.2011 (Unit Nos. X Unit NAV as on 31.7.2011) (₹)**
MF A	12,00,000	1,17,073.17	10.20	11,94,146.33
MF B	4,00,000	39,408.87	10.25	4,03,940.92

MF C	2,50,000	25,000	9.90	2,47,500.00

Scheme	NAV (+) / (–)(NAV as on 31.7.2011 – Investment) (₹)	Dividend Received (₹)	Total Yield Change in NAV +Dividend (₹)	Number of days	Effective Yield (% p.a.) (Total Yield/ Investment) X (365/No. of days) X 100
MF A	(–)5,853.67	23,000	17,146.33	122	4.275%
MF B	(+)3,940.92	6,000	9,940.92	92	9.86%
MF C	(–)2,500	Nil	(–)2,500	31	(–)11.77%

Question 15:

Price of each unit on 1.1.2014 = Rs. 28 x 0.95 = Rs. 26.60

Price of each unit on 31.12.2014 = Rs. 28.80 x 1.03 = Rs. 29.66

The price of fund increase by = Rs. 3.06 (29.66 – 26.60)

Rate of Return = $\frac{2.80 + 3.06}{26.60} \times 100 = 22.03\%$

Question 22:

Dividend Plan

Unit acquired = 5,00,000/ 46 = 10869.57

Date	*Units held*	*Dividend*		*Reinvestment*	*New*	*Total*
		%	*Amount*	*Rate*	*Units*	*Units*
01.04.2014						10869.57
31.12.2014	10869.57	12	13043.48	47.0	277.52	11147.09
31.03.2016	11147.09	15	16720.64	49.5	337.79	11484.88
31.03.2018	11484.88	10	11484.88	48.0	239.27	11724.15
31.03.2019	Maturity Value (₹ 49.0 X 11724.15)					₹ 5,74,483.35
	Less: Cost of Acquisition					₹ 5,00,000.00
	Total Gain					₹ 74483.35

$\therefore$ Effective Yield = $\frac{₹\ 74,483.35}{₹\ 5,00,000} \times \frac{1}{5} \times 100 = 2.98\%$

Bonus Plan

Units Acquired = $\frac{10,00,000}{42}$ = 23809.52

Date	Particulars	Calculation Working	No. of Units	NAV (₹)
1.4.14	Investment		23809.52	42
30.9.15	Bonus	23,809.52 / 4 =	5952.38	
			29761.90	43
30.9.17	"	29761.9 / 6 =	4960.32	
			34722.22	44
31.3.19	Maturity Value	34722.22 x ₹ 44 =		15,27,777.68
	Less: Investment			10,00,000.00
	Gain			5,27,777.68

$\therefore$ Effective Yield $\frac{5,27,777.68}{10,00,000} \times \frac{1}{5} \times 100 = 10.56\%$

Question 32:

Working Notes:

i. Decomposition of Funds in Equity and Cash Components

	AJ Mutual Fund	RP Mutual Fund
NAV on 31.08.21	₹ 80.00	₹ 61.00
% of Equity	95%	98.36%
Equity element in NAV	₹ 76.00	₹ 60.00
Cash element in NAV	₹ 4.00	₹ 1.00

ii. Calculation of Beta

(a) **AJ Mutual Fund**

Sharpe Ratio = 1.5 = $\frac{E(R) - R_f}{\sigma_{AJ}} = \frac{E(R) - R_f}{10}$

$E(R) - R_f = 15$

Treynor Ratio = 12 = $\frac{E(R) - R_f}{\beta_{AJ}} = \frac{15.00}{\beta_{AJ}}$

$\beta_{AJ} = 15.00/12 = 1.25$

(b) **RP Mutual Fund**

Sharpe Ratio = 3 = $\frac{E(R) - R_f}{\sigma_{RP}} = \frac{E(R) - R_f}{6}$

$E(R) - R_f = 18$

Treynor Ratio = 10 = $\frac{E(R) - R_f}{\beta_{RP}} = \frac{18}{\beta_{RP}}$

$\beta_K = 18/10 = 1.80$

iii. Increase in the Value of Equity

	AJ Mutual Fund	RP Mutual Fund
Market rose by	2.00%	2.00%
Beta	1.25	1.80
Equity component goes up	2.50%	3.60%

iv. Balance of Cash after 1 month

	AJ Mutual Fund	RP Mutual Fund
Cash in Hand on 30.09.21	₹ 4.00	₹ 1.00
Less: Exp. Per month	₹ 0.50	₹ 0.50
Balance after 1 month	₹ 3.50	₹ 0.50

NAV after 1 month

	AJ Mutual Fund	RP Mutual Fund
Value of Equity after 1 month		
76 x (1 + 0.025)	₹ 77.90	-
60 x (1 + 0.036)	-	₹ 62.16
Cash Balance	₹ 3.50	₹ 0.50
NAV	₹ 81.40	₹ 62.66

Question 33:

i. The monthly risk free rate of return = (12%/12) = 1%

January	-0.52	0.82
February	2.20	0.04
March	2.17	2.80
April	4.17	1.72
May	2.04	0.27
June	3.00	0.39
July	1.99	1.95
August	4.00	0.64
September	-1.38	1.53
October	2.67	2.70
November	3.99	2.52
December	1.86	2.09
	26.19	17.47
Average Returns	2.1825	1.4558

Average Portfolio Return (R_p) = 2.1825
Average Portfolio Return (R_m) = 1.4558
Portfolio Risk (σ_P) = 1.6223
Market Risk (σ_m) = 0.9498

Since portfolio A is fully diversified then it can be computed with a portfolio whose beta (β) can be found as follows:

$$\sigma_m^2 \times \beta^2 = \sigma_P^2$$

$$\beta = \frac{\sigma_P}{\sigma_m} = \frac{1.6223}{0.9498} = 1.708$$

Therefore, portfolio A is comparable to a portfolio whose Beta is 1.708.

Expected monthly returns on such portfolio can be calculated as follows:

$R_P^1 = R_f + \beta(R_m - R_f)$

= 1% + 1.708 (1.4558% - 1.0000%)

= 1.7785%

Return due to the net selectivity = $R_P - R_p^1$

= 2.1825% - 1.7785%

= 0.404% per month

ii. The returns due to higher risk assumed by the portfolio manager
= 1.7785% - 1.4558% = 0.3227% per month

Question 34:

Sharpe Ratio $S = (R_p - R_f)/\sigma_p$

Treynor Ratio $T = (R_p - R_f)/\beta_p$

Where,

R_p = Return on Fund
R_f = Risk-free rate
σ_p = Standard deviation of Fund
β_p = Beta of Fund Reward to Variability (Sharpe Ratio)

Reward to Variability (Sharpe Ratio)

MutualFund	R_p	R_f	$R_p - R_f$	σ_p	Reward toVariability	Ranking
A	15	6	9	7	1.285	2
B	18	6	12	10	1.20	3
C	14	6	8	5	1.60	1
D	12	6	6	6	1.00	5
E	16	6	10	9	1.11	4

Reward to Volatility (Treynor Ratio)

MutualFund	R_p	R_f	$R_p - R_f$	β_p	Reward toVolatility	Ranking
A	15	6	9	1.25	7.2	2
B	18	6	12	0.75	16	1

C	14	6	8	1.40	5.71	5
D	12	6	6	0.98	6.12	4
E	16	6	10	1.50	6.67	3

Question 36:

Calculation of Income available for Distribution

	Units (Lakh)	Per Unit (₹)	Total (₹ In lakh)
Income from April	400	0.0799	31.960
Add: Dividend equalization collected on issue	5	0.0799	0.3995
	405	0.0799	32.3595
Add: Income from May		0.1139	46.125
	405	0.1938	78.4845
Less: Dividend equalization paid on repurchase	4	0.1938	(0.7752)
	401	0.1938	77.7093
Add: Income from June		0.1458	58.470
	401	0.3396	136.1793
Less: Dividend Paid		0.2038	(81.7076)
	401	0.1358	54.4717

Calculation of Issue Price at the end of April

	₹
Opening NAV	19.00000
Add: Entry Load 2% of ₹ 19	(0.38000)
	19.38000
Add: Dividend Equalization paid on Issue Price	0.07999
	19.45999
	Or 19.46

Calculation of Repurchase Price at the end of May

	₹
Opening NAV	19.0000
Less: Exit Load 2% of ₹ 19	(0.3800)
	18.6200
Add: Dividend Equalization paid on Issue Price	0.1938
	18.8138

Closing NAV as on 30th June

		₹ (Lakh)
Opening Net Asset Value (₹ 19 × 400)		7,600.0000
Portfolio Value Appreciation		515.6700
Issue of Fresh Units (5 × 19.46)		97.3000
Income Received (31.960 + 46.125 + 58.470)		136.5550
		8349.5250
Less: Units repurchased (4 × 18.8138)	75.2552	
Income Distributed	81.7076	156.9628
Closing Net Asset Value		8,192.5622
Closing Units (400 + 5 – 4) lakh		401 lakhs
∴ Closing NAV as on 30th June		₹ 20.4303

HOME WORK QUESTION

Question 11:

i. Return of Mrs. Charu invested in Plan A (Dividend Reinvestment)

(Amount in ₹)

Date	*Investment*	*Dividend payout (%)*	*Dividend Re-invested (Closing Units X Face value of '10 X Dividend Payout %)*	*NAV*	*Units*	*Closing Unit Balance ∑ Units*
01.04.2009	1,00,000.00			10.00	10,000.00	10,000.00
28.07.2013		*20*	20,000.00	30.70	651.47	10,651.47
31.03.2014		*70*	74,560.29	58.42	1,276.28	11,927.75
31.10.2017		*40*	47,711.00	42.18	1,131.13	13,058.88
15.03.2018		*25*	32,647.20	46.45	702.85	13,761.73
24.03.2019		40	55,046.92	48.10	1,144.43	14,906.16

Redemption value 14,906.16 × 53.75	8,01,206.10
Less: Security Transaction Tax (STT) is 0.2%	1,602.41
Net amount received	7,99,603.69
Less: Short term capital gain tax @ 10% on 1,144.43 (53.64* – 48.10≈) = 6,340	634
Net of tax	7,98,969.69
Less: Investment	1,00,000.00
	6,98,969.69

*(53.75 – STT @ 0.2%) ≈ This value can also be taken as zero

Annual average return (%) $\frac{6,98,969.69}{1,00,000} \times \frac{12}{124} \times 100 = 67.64\ \%$

ii. Return of Mr. Anand invested in Plan B – (Bonus)

				(Amount in ₹)
Date	*Units*	*Bonus units*	*Total Balance*	*NAV per unit*
01.04.2009	10,000		10,000	10
31.03.2014		12,500	22,500	31.05
31.03.2018		7,500	30,000	20.05
24.03.2019		7,500	37,500	19.95

Redemption value 37,500 × 22.98	8,61,750.00
Less: Security Transaction Tax (STT) is 0.2%	1,723.50
Net amount received	8,60,026.50
Less: Short term capital gain tax @ 10%	
7,500 × (22.93† – 19.95) = 22,350	2,235.00
Net of tax	8,57,791.50
Less: Investment	1,00,000.00
Net gain	7,57,791.50

†(22.98 – STT @ 0.2%)

Annual average return (%) $\frac{7,57,791.50}{1,00,000} \times \frac{12}{124} \times 100 = 73.33\ \%$

iii. Return of Mr. Bacchan invested in Plan C – (Growth)

Particulars	(Amount in ₹)
Redemption value 10,000 × 82.07	8,20,700.00
Less: Security Transaction Tax (S.T.T) is .2%	1,641.40
Net amount received	8,19,058.60
Less: Short term capital gain tax @ 10%	0.00
Net of tax	8,19,058.60
Less: Investment	1,00,000.00
Net gain	7,19,058.60

Annual average return (%) $\frac{7,19,058}{1,00,000} \times \frac{12}{124} \times 100 = 69.59\ \%$

Note: Alternatively, figure of * and † can be taken as without net of Tax because, as per Proviso 5 of Section 48 of IT Act, no deduction of STT shall be allowed in computation of Capital Gain.

Question 12:

i. Returns for the year

(All changes on a Per -Unit Basis)

Change in Price:	₹ 10.25 – ₹9.45 =	₹ 0.80
Dividends received:		₹ 0.85
Capital gains distribution		₹ 0.70
Total reward		₹ 2.35

Holding period reward: $\frac{2.35}{9.45} \times 100 = 24.87\%$

ii. When all dividends and capital gains distributions are re-invested into additional units of the fund @ (₹9.55/unit)

Dividend + Capital Gains per unit = ₹ 0.85 + ₹ 0.70 = ₹ 1.55
Total received from 300 units = ₹ 1.55 x 500 = ₹ 775/-.
Additional Units Acquired = ₹ 775/₹ 9.55= 81.15 Units.
Total No. of Units = 500 units + 81.15 units = 581.15 units.
Value of 581.15 units held at the end of the year = 581.15 units x ₹10.25 = ₹ 5956.79
Price Paid for 500 Units at the beginning of the year = 500 units x ₹9.45 = ₹ 4725.00

Holding Period Reward

₹ (5956.79 – 4725.00) = ₹ 1231.79
Holding Period Reward = (1231.79/4725)× 100 = 26.07%

Conclusion: Since the holding period reward is more in terms of percentage in option -two i.e., reinvestment of distributions at an average NAV of ₹9.55 per unit, this option is preferable.