STRATEGIC RISK MANAGEMENT [C1] – CHARTERED LEVEL

Marks

Question No. 1

(a) Following are the issues in the management culture of the APCL:

- The CEO wants the ERM program to focus only on the problem areas in the company (underwriting department). 01

- The CEO and the Board display a lack of understanding of the importance of ERM, and have insufficient active involvement in the ERM process. 01

- The CEO believes that a strong risk based capital ratio is the only requirement for risks to be "financially covered". 01

(b) Basic components of ERM program will be as under:

- The ERM function should be independent of the CEO 01

- Active involvement from the Board 01

- Strong buy-in from senior management and business units 01

- Significant resources need to be committed to the day-to-day execution of the program 01

- Develop methods to consistently identify, measure, and manage risk exposures and losses within chosen risk tolerances 01

- Needs to aggregate and manage risk with an enterprise view, taking into consideration correlation and diversification 01

- Need comprehensive and frequent risk reporting around all key areas of risk exposures 01

Question No. 2

(a) A financial institution generally undertakes four trading activities in FX market:

(i) The purchase and sale of foreign currencies to allow customers to partake in and complete international commercial trade transactions. 01

(ii) The purchase and sale of foreign currencies to allow customers to take positions in foreign real and financial investments. 01

(iii) The purchase and sale of foreign currencies for hedging purposes to offset customer (or FI) exposure in any given currency. 01

(iv) The purchase and sale of foreign currencies for speculative purposes through forecasting or anticipating future movements in FX rates. 01

Marks

(b)   **Net savings from netting:**

(Amount in base currency: PKR)

Creditor Company	Debtor Company				
	ST	SL	SB	Total	
ST	–	–	95,000,000	95,000,000	½
SL	84,000,000	–	–	84,000,000	½
SB	–	68,750,000	–	68,750,000	½
Total payments	(84,000,000)	(68,750,000)	(95,000,000)	247,750,000	1
Total receipts	95,000,000	84,000,000	68,750,000	247,750,000	1
Net settlement	11,000,000	15,250,000	(26,250,000)	–	1

SB should pay Rs.11,000,000 to ST and Rs.15,250,000 to the SL.   1

Savings:	PKR	
Savings in bank charges [(3 – 2) x 5,400]	5,400	1
Reduction in amount of foreign currency [0.05% x (247,750,000 – 26,250,000)]	110,750	1½
Reduction in float [247,750,000 x 3/365 x 5.5%]	111,997	2
Total	**228,147**	1

Question No. 3

(a)   The basic elements of the process are as under**:**

Negotiation and follow-up. Proactive effort should be taken in dealing with obligors to implement remedial plans, by maintaining frequent contact and internal records of follow-up actions. Often rigorous efforts made at an early stage prevent institutions from litigations and loan losses.   02

Workout remedial strategies. Sometimes appropriate remedial strategies such as restructuring of loan facility, enhancement in credit limits or reduction in interest rates help improve obligor's repayment capacity. However it depends upon business condition, the nature of problems being faced and most importantly obligor's commitment and willingness to repay the loan. While such remedial strategies often bring up positive results, institutions need to exercise great caution in adopting such measures and ensure that such a policy must not encourage obligors to default intentionally**.** The institution's interest should be the primary consideration in case of such workout plans. It needs not mention here that competent authority, before their implementation, should approve such workout plan.   02

Review of collateral and security document. Institutions have to ascertain the loan recoverable amount by updating the values of available collateral with formal valuation. Security documents should also be reviewed to ensure the completeness and enforceability of contracts and collateral/guarantee.   02

Status Report and Review. Problem credits should be subject to more frequent review and monitoring. The review should update the status and development of the loan accounts and progress of the remedial plans. Progress made on problem loan should be reported to the senior management.   02

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(b) Variables affecting credit risk are as under:

- Probability of default   01
- Credit exposure at default   01
- Loss given default (LGD)   01

(c) Expected credit loss [ECL]= Probability of default (PD)x credit exposure at default (CE)x LGD   01

PD= 3%; CE=35 million; and LGD = 1-75%= 25%   01

ECL= 3% x 35,000,000 x 25%= Rs. 262,500   01

(d) The response is as under:

Action	Status	Justification	
Bank provides statement of account to its credit card holders every quarter.	Non-compliant	**Regulation O-2:** Statement of Account must be provided monthly	1
Bank as a matter of policy does not provide statement of account to its credit card holders if there is no transaction.	Compliant	**Regulation O-2:** Bank is not required to provide statement if there is no transaction	1
Credit card statement of account does not specify due date of payment, though 15th of each month is duly specified as due date in the agreement with each credit card holder.	Non-compliant	**Regulation O-5**: Statement of Account must specify due date notwithstanding stipulation in the agreement	1
Bank classifies its credit card advances as "Loss" if payments of interest or principal are in arrears by 365 days.	Non-compliant	**Regulation R-8:** Loss classification is required after payments in arrears of 180 days	1
Bank has recently intimated telephonically to all its existing card holders that effective billing for the quarter ending June 30, 2017, it will charge insurance premium to its card holder in respect of insurance coverage against the risk of unauthorized transactions and credit card frauds. Bank included the insurance premium in the bill despite refusal by all the card holders to accept the decision, for which no provision exist in the agreement.	Non-compliant	**Regulation O-5:** Bank must have the card holders consent	1
Bank makes provision against non-performing loans [NPLs] @ 75% of the amount of credit card advances classified as "Loss" less liquid securities held by the bank.	Non-compliant	**Regulation R-8:** Provision must be created @ 100% of the amount of credit card advances classified as "Loss" less liquid securities held by the bank	1

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Question No. 4

(a) Operational risk can be minimized in a number of ways. Internal control methods consist of:

- **Separation of functions:** Individuals responsible for committing transactions should not perform clearance and accounting functions.

- **Dual entries:** Entries (inputs) should be matched from two different sources, that is, the trade ticket and the confirmation by the back office.

- **Reconciliations:** Results (outputs) should be matched from different sources, for instance the trader's profit estimate and the computation by the middle office.

- **Tickler systems:** Important dates for a transaction (e.g., settlement, exercise dates) should be entered into a calendar system that automatically generates a message before the due date.

- **Controls over amendments:** Any amendment to original deal tickets should be subject to the same strict controls as original trade tickets.

Any three (3) @ 1 mark each = 3

External control methods consist of:

- **Confirmations:** Trade tickets need to be confirmed with the counterparty, which provides an independent check on the transaction.

- **Verification of prices:** To value positions, prices should be obtained from external sources. This also implies that an institution should have the capability of valuing a transaction in-house before entering it.

- **Authorization:** The counterparty should be provided with a list of personnel authorized to trade, as well as a list of allowed transactions.

- **Settlement:** The payment process itself can indicate if some of the terms of the transaction have been incorrectly recorded, for instance, as the first cash payments on a swap are not matched across counterparties.

- **Internal/external audits:** These examinations provide useful information on potential weakness areas in the organizational structure or business process.

Any three (3) @ 1 mark each = 3

STRATEGIC RISK MANAGEMENT [C1] – CHARTERED LEVEL

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(b) There are six fundamental principles that all institutions, regardless of their size or complexity, should address in their approach to operational risk management.

(i) Ultimate accountability for operational risk management rests with the board, and the level of risk that the organization accepts, together with the basis for managing those risks, is driven from the top down by those charged with overall responsibility for running the business.

(ii) The board and executive management should ensure that there is an effective, integrated operational risk management framework. This should incorporate a clearly defined organizational structure, with defined roles and responsibilities for all aspects of operational risk management/monitoring and appropriate tools that support the identification, assessment, control and reporting of key risks.

(iii) Board and executive management should recognize, understand and have defined all categories of operational risk applicable to the institution. Furthermore, they should ensure that their operational risk management framework adequately covers all of these categories of operational risk, including those that do not readily lend themselves to measurement.

(iv) Operational risk policies and procedures that clearly define the way in which all aspects of operational risk are managed should be documented and communicated. These operational risk management policies and procedures should be aligned to the overall business strategy and should support the continuous improvement of risk management.

(v) All business and support functions should be an integral part of the overall operational risk management framework in order to enable the institution to manage effectively the key operational risks facing the institution.

(vi) Line management should establish processes for the identification, assessment, mitigation, monitoring and reporting of operational risks that are appropriate to the needs of the institution, easy to implement, operate consistently over time and support an organizational view of operational risks and material failures.

Any four (4) @ 1 mark each =   4

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Question No. 5

(a) **(i)** CGAP = ISA-ISL =310 – 280 = Rs.30 million | 01

ISA = 100 + 60 + 70 + 80 = Rs.310 | 01

ISL = 80 + 40 + 120 + 40 = Rs.280 | 01

(ii) **Refinancing risk:** The risk that the cost of rolling over or re-borrowing funds will rise above the returns being earned on asset investments. | 01

Reinvestment risk: The risk that the returns on funds to be reinvested will fall below the cost of the funds. | 01

A bank is vulnerable to refinancing or reinvestment risk depending upon the gap between ISA and ISL. | 01

If ISA > ISL, the entity is vulnerable to reinvestment risk. On the other hand, if ISA<ISL, refinancing risk is the fate of the entity.

As the gap between ISA and ISL of BCM Bank Limited is positive in one-year maturity bucket, it is subject to reinvestment risk. | 01

(iii) $\Delta NII = \Delta Interest\ asset \times ISA - \Delta Interest\ liabilities \times ISL$ | 01

$\Delta NII = 1.3\% \times 310\ million - 1.1\% \times 280\ million$ | 01

$\Delta NII = 4.03\ million - 3.08\ million = 0.95\ million$ | 01

(b) The default rate for the March quarter shall be calculated as follows:

LP1 = Outstanding amount of performing loans on January 1st= Rs.105 billion | ½

Dq1 = Amount of defaults at the end of the quarter out of the total LP = Rs.3 billion | ½

R1 = Amount of loans repaid during the quarter = Rs.5 billion | ½

Default Rate for March quarter shall be calculated as follows:

DRq1 = Dq1 / (L P1 – R1) = 3/(105 - 5) = 3% | 1

The default rate for the June quarter shall be calculated using the above formula.

LP2 = Outstanding amount of performing loans on April 1st= Rs.104 billion | ½

Dq2 = Amount of defaults at the end of the quarter out of the total LP = Rs.5 billion | ½

R2 = Amount of loans repaid during the quarter = Rs.4 billion | ½

Default Rate for June quarter shall be calculated as follows:

DRq2 = Dq2 / (L P2 – R2) = 5/(104 - 4) = 5% | 1

Marks

Question No. 6

(a) **(i)** The Sharpe ratio of reward to variability is calculated as:

$$S = \frac{E(r_P) - r_f}{\sigma_P}$$

Fund AK Sharpe ratio = (8 - 6) / 6 = 0.33   1

Fund BM Sharpe ratio = (10 − 6)/ 8 = 0.50   1

Fund CN Sharpe ratio = (12 − 6)/ 10 = 0.60   1

Fund CN has the highest value for the Sharpe ratio, so Mehwish should select Fund CN.   1

(ii) Information ratio = residual return / residual risk

Fund AK information ratio = 1.2 / 1.8 = 0.67   1

Fund BM information ratio = 0.8 / 1.5 = 0.53   1

Fund CN information ratio = 1.5 / 3.2 = 0.47   1

Fund AK has the highest information ratio (0.67) compared to Funds BM and CN (0.53 and 0.47, respectively). So. Fund AK will have the highest value added for Mehwish regardless of her risk aversion.   1

(iii) Fund BM information ratio = 0.8 / 1.5 = 0.53   1

Optimal level of risk $= \omega_i * IR/2(= 0.53/2(0.15) = 1.78\%$ 1

Mehwish would prefer that Fund BM increase the level of residual risk from its current level of 1.5% to the optimal level of 1.78%.   1

(iv) Fund CN information ratio = 1.5 / 3.2 = 0.47   1

Optimal level of risk $= \omega^* =$ fund C's current residual risk = 3.2%

Mehwish's implied level of risk aversion $= (= IR/(2\omega^{1}*) = 0.47/(2(3.2)) = 0.07$ 1

(b) The efficient frontier is a plot of the expected return and risk combinations of all efficient portfolios, all of which lie along the upper portion of the minimum variance frontier (from Point C to Point G in following figure)
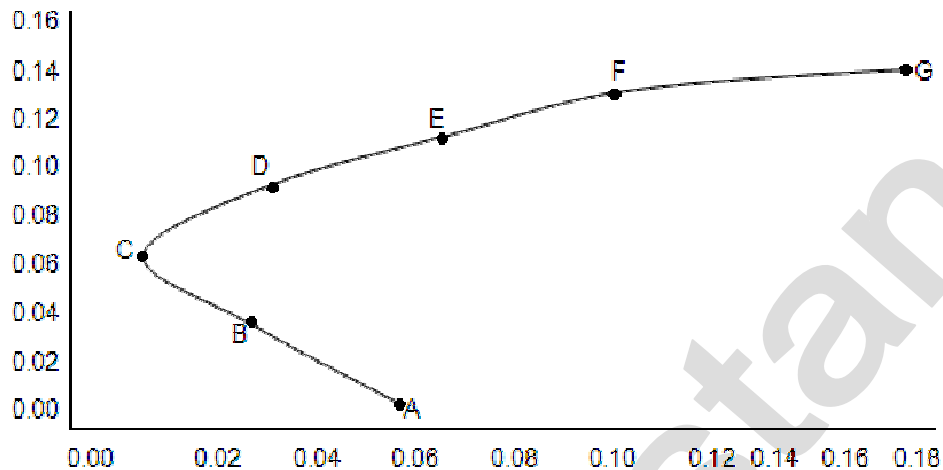
Expected Return/ Variance Combinations: 1

Portfolio	Expected Return	Variance
A	0.02	0.05
B	0.04	0.02
C	0.06	0.01
D	0.08	0.02
E	0.10	0.05
F	0.12	0.10
G	0.14	0.17

1

Marks

Figure : Minimum Variance Frontier: Expected Return vs Variance:

1

Portfolio such as D and E in above figure are called efficient portfolio, which are portfolios that have:

- Minimum risk of all portfolios with the same expected return.

- Maximum expected return for all portfolios which the same risk.

1

The efficient frontier is an extremely useful portfolio management tool. Once the investor's risk tolerance is determined and quantified in terms of variance or standard deviation, the optimal portfolio for investor can be easily identified. For example, the best portfolio for an investor willing to accept variance equal to 0.02 is portfolio D. The best portfolio for an investor willing to accept vairance equal to 0.17 is Portfolio G. Note that the investor choosing Portfolio D is more risk averse than the investor choosing Portfolio G.

1

(c) Systematic risk: Risk that influences a large number of assets, each to a greater or lesser extent.

Because systematic risks have market wide effects, they are sometimes called market risks.

Systematic risk cannot be eliminated by diversification, therefore the term non-diversifiable risk are also used interchangeably with systematic risk.

1

Unsystematic risk: Risk that influences a single asset, or possibly a small group of assets. Because these risks are unique to individual companies or assets, they are sometimes called unique or asset-specific risks. Unsystematic risk can be eliminated by diversification.

1

Question No. 7

(a) (i) Pure premium: That part of the rate that is intended to cover losses is called the pure premium when expressed in dollars and cents, and the expected loss ratio when expressed as a percentage.

Pure premium $= \dfrac{losses Expected}{Number\ of\ exposure\ units\ covered}$

1

Marks

Gross premium: Regardless of the type of insurance, the premium income of the insurer must be sufficient to cover losses and expenses. To obtain this premium income, the insurer must predict the claims and expenses and then allocate these anticipated costs among the various classes of policyholders. The final premium that the insured pays is called the gross premium and is based on a gross rate.

$$\text{Gross premium} = \frac{Pure\ Premium}{1 - Premissible\ loss\ ratio}$$

1

(ii)

$$\text{Pure premium} = \frac{450,000,000}{150,000} = \text{Rs. 3,000 per automobile}$$

1

$$\text{Gross premium} = \frac{3,000}{1 - 45\%} = \text{Rs. 5,455 per automobile}$$

2

(b) Insurability of the Risk

Insurers will accept responsibility for risks that meet at least the following conditions:

1. Losses must not be under the control of the insured. Losses caused by fire, wind, or accident generally are insurable, but gambling losses are not. Nor will an insurer pay a claim for damage intentionally caused by the insured person. For example, a person who sets fire to an insured building cannot collect on a fire insurance policy.

2. The insured hazard must be geographically widespread. That is, the insurance company must be able to write many policies covering the same specific hazard throughout a wide geographic area. This condition allows the insurer to minimize its own risk: the risk that it will have to pay huge sums of money to clients within a particular geographic area in the event of a catastrophe caused, for example, by a tornado or an earthquake.

3. The probability of a loss should be predictable. Insurance companies cannot tell which particular clients will suffer losses. However, their actuaries must be able to determine, statistically, what fraction of their clients will suffer each type of loss. They can do so, for insurable risks, by examining records of losses for past years. They can then base their premiums, at least in part, on the number and value of the losses that are expected to occur.

4. Losses must be measurable. Insured property must have a value that is measurable in dollars because insurance firms reimburse losses with money. Moreover, premiums are based partly on the measured value of the insured property. As a result of this condition, insurers will not insure an item for its emotional or sentimental value but only for its actual monetary value.

5. The policyholder must have an insurable interest. That is, the individual or firm that purchases an insurance policy must be the one that would suffer from a loss. You can purchase insurance on your own home, but you cannot insure your neighbour's home in the hope of making a profit if it should burn down! Generally, individuals are considered to have an insurable interest in their family members. Therefore, a person can insure the life of a spouse, a child, or a parent. Corporations may purchase "key executive" insurance covering certain corporate officers. The proceeds from this insurance help offset the loss of the services of these key people if they die or become incapacitated.

Any five (5) @ 1 mark each =   5

THE END