

Applied Mathematics M.C.Q's (from 1 to 20)

Time: 35 Minutes

Questions on Page Numbers: 1 To 4

Negative Markings: **Yes**

Q1 Arshad alone can complete a task in 20 days and Raheem can complete the same task in 6 days. Arshad initially starts working on the task alone for the first nine days. However after that he suffers an injury which will make him take thrice the time to complete the task. Raheem joins Ahmed (who has been injured) on the tenth day and they together complete the task. At the end of the task they are paid a sum of Rs 60, 000 which they decide to share between themselves in the proportion of the work done. How much money is Raheem entitled to?

- A) Rs 1000
- B) Rs 1500
- C) Rs 3000
- D) Rs 4500

Q2 Pipe A can fill a tank in 6 hours. Pipe B can empty the same tank in 3 hours. If the tank is initially one third full then in how many hours will the tank be completely empty in if both the pipes are turned on simultaneously?

- A) 2 hours
- B) 3 hours
- C) 4 hours
- D) 5 hours

Q3 What is the value of x if $(-3)^{(x+1)} = -243$?

- A) 3
- B) 4
- C) -3
- D) -4

Q4 If 3 miles are equivalent to 4.83 kilometers, then 14.49 kilometers are equivalent to how many miles?

- A) 1.76
- B) 5.9
- C) 7
- D) 9

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

Q5 The arithmetic mean of three numbers is $m + 3$. If one of the numbers is 10, what is the arithmetic mean of other numbers?

- A) $3m - 1$
- B) $1.5m - 0.5$
- C) $m - 7$
- D) None of these

Q6 The diameter of a circle is increased by 200%. By what percent has the area of the circle increased?

- A) 80%
- B) 200%
- C) 300%
- D) 800%

Q7 If $\frac{9x-3}{2x+1} = \frac{6x+2}{3x+1}$, what is the value of x ?

- A) 1
- B) -1
- C) $\frac{-1}{3}$
- D) None of these

Q8 The average of the first eight multiples of 8 (starting from 8) is:

- A) 30
- B) 32
- C) 34
- D) 36

Q9 A train 180m long is running at a uniform speed and passes a telegraph pole in 5 seconds. Find the time taken by it to cross a railway platforms which is also 180m long when it does not stop at the platform and continue to run at the same uniform speed.

- A) 5 seconds
- B) 7 seconds
- C) 10 seconds
- D) 12 seconds

(go on to the next page)

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

Q10 Faheem receives a base salary of Rs 9000 weekly plus a 15% commission on all sales. He had Rs 30, 000 in sales this week. How much did Faheem make in total?

- A) Rs 13, 500
- B) Rs 31, 350
- C) Rs 10, 500
- D) Rs 30, 450

Q11 A Mother's age after 10 years will be thrice the age of her daughter now. The sum of their ages 6 years ago was 56. What is the ratio of the current ages of the mother and the daughter?

- A) 25:3
- B) 3:25
- C) 14:3
- D) 3:14

Q12 A class of 80 students contains only seniors and juniors. If 35% of the students are junior, what is the ratio of the number of seniors to the number of juniors in the class?

- A) 13:7
- B) 7:13
- C) 16:7
- D) 7:16

Q13 Three lottery winners A, B & C are sharing a lottery jackpot. A's share is $\frac{1}{6}$ of B's share and $\frac{1}{9}$ of C's share. If the total jackpot is \$480,000, what is the dollar amount of B's share?

- A) \$18,000
- B) \$27,000
- C) \$30,000
- D) None of these

Q14 A man completes a journey in 16 hours. He travels during first 8 hours of the journey at the rate of 120 km/hr and during the remaining hours of the journey at the rate of 88 km/hr. Find the total distance that the man covered during the journey?

- A) 1600 km
- B) 1664 km
- C) 1920 km
- D) None of these

(go on to the next page)

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

Q15 The average of 80 numbers is zero. Of them, at the most, how many can be greater than zero?

- A) 0
- B) 1
- C) 79
- D) 80

Q16 Which of the following is equal to 6.78×10^{-3} ?

- A) 0.00678
- B) 678
- C) 0.0678
- D) 6780

Q17 How many numbers are there between 1 and 61 which are divisible by 6 or 9?

- A) 13
- B) 14
- C) 15
- D) 16

Q18 If $4x^2 + 9y^2 = 9$ and $(2x - 3y)^2 = 27$, where x and y are both real numbers, then

- A) x and y are both positive
- B) x and y are both negative
- C) $x = y$
- D) None of these

Q19 There are four numbers. Average of the first three is 15 and that of the last three is 16. If the last number is 19 find the first number:

- A) 22
- B) 20
- C) 18
- D) 16

Q20 What is the difference between the sum of all positive odd integers less than 1000 and the sum of all positive even integers less than 1000?

- A) 498
- B) 499
- C) 500
- D) 501

(Stop. Do not turn over this page until you are told to do so.)

English M.C.Q's (from 21 to 40)**Time: 25 Minutes****Questions on Page Numbers: 5 To 9****Negative Markings: Yes**

Questions 21-25: Please read the excerpt below with care and select the best possible answer.

If you open a history of Britain at random, it will tell you two things about the period you chance on: that it was a time of rapid change, and that the middle classes went on rising. Rising is what God put the middle classes on Earth to do. In fact, according to an illuminating study, they have now risen to the point where they outnumber the working class. Whether this is true depends of course on how you define these categories. Marx thought that the proletariat would overthrow capitalism, but he did not think that this was because it formed a majority of the population. In fact, he was well aware that factory workers did not even constitute the majority of the working class, let alone of the nation as a whole. Most working people in Victorian Britain were domestic servants, of whom a large majority were women. Most of those who laboured in Marx's day were not blue-collar male but white-petticoated female. The word proletariat derives from the Latin word for offspring, meaning those who were too poor to serve the state with anything but the potential workers they produced from their wombs. Today, in a world of postcolonial sweatshops and agricultural labour, the typical proletarian is still a woman.

21. According to this passage, a history of Britain will inform you of which of the following?

- a) that the period being discussed was static and that the middle classes were rising
- b) that the period being discussed was mercurial and that the middle classes were marginalized
- c) that the period being discussed was undergoing a swift transformation and that the middle classes were expanding
- d) that the period being discussed was undergoing a swift transformation and that the middle classes were marginalized

22. The word illuminating (underlined in the paragraph) means:

- a) luminous and pliable
- b) luminous and liable
- c) derogatory
- d) informative

23. The word proletariat (underlined in the paragraph) means:

- a) provincial
- b) the working class
- c) the polity
- d) citizenry

24. This passage suggests that the proletariat in Victorian Britain consisted primarily of:

- a) domestic workers
- b) factory workers
- c) the working class
- d) blue-collar workers

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

25. By stating that the etymological roots of proletariat lie in the Latin word for offspring, the author is trying to say that the working class comprises of:

- a) single mothers
- b) widowed mothers
- c) women
- d) mothers

Questions 26-30: The sentences, please select the *best* sequence of sentences

26.

- 1. Perhaps this suggests that there are limits to the prime minister's resentment of the posh boys.
- 2. Not even she could bring herself to turn Eton into an old people's home.
- 3. The solution is to "make Britain the world's Great Meritocracy."
- 4. The aforementioned seems not to include abolishing private education.
- 5. The greatest injustice in Britain today, it is revealed, is that people's lives are still largely determined by where they come from and what school they attend.

- a) 12345
- b) 43521
- c) 12435
- d) 53412

27.

- 1. Had the SC not disqualified Nawaz Sharif, it wouldn't have just been a lost game for Imran Khan.
- 2. Prior to the Supreme Court's verdict, everyone hoped that justice would prevail and set an example for the next generation to come.
- 3. Martin Luther King Jr. said, "Injustice anywhere is a threat to justice everywhere."
- 4. The verdict is a triumphant victory for Pakistan.
- 5. Additionally, it would have been a lost game for the whole of Pakistan.

- a) 12345
- b) 32154
- c) 23154
- d) 54231

28.

- 1. Of some 18 major and minor mass extinctions since the dawn of complex life, most happened at the same time as a rare, epic volcanic phenomenon called a Large Igneous Province (LIP).
- 2. Coincidence doesn't prove causality.

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

3. Many of those extinctions were also accompanied by abrupt climate warming, expansion of ocean dead zones and acidification, like today.

4. Earth's most severe mass extinction, the "Great Dying," began 251.94 million years ago at the end of the Permian period, with the loss of more than 90% of marine species.

5. However, when the same two things happen together over and over again through the vast span of geological time, there must be a causal link.

a) 12345

b) 25134

c) 54123

d) 32451

29.

1. But Hussain didn't just step up out of nowhere to try and kill Siddiqui.

2. She cut off all communication between them, but he hacked her social media accounts and continued to harass her.

3. Finally, one day he drew up alongside her car, wearing a motorcycle helmet and armed with a knife.

4. Last year, Pakistani law student Khadija Siddiqui was stabbed 23 times by a classmate named Shah Hussain, leaving her lying on the road in a pool of her own blood.

5. They'd been friends in law school until Hussain became "coercive" against Siddiqui.

a) 12345

b) 25413

c) 41523

d) 52413

30.

1. But as ever where Venezuela is concerned, there is also conflict.

2. Firstly, it is important to note that for academics on the left, broadly supportive of Chavismo's aims, this democratic slide has been a cause for much heartache and soul-searching.

3. While some felt that Chávez's project has failed, others thought that Venezuela's problems are "not the result of too much socialism, but too little".

4. The leadership of the Latin American Studies Association issued a statement calling on the government to respect the 1999 constitution.

5. They received a reply from dozens of its 12,000 members rejecting their framing of the issue.

a) 12345

b) 52413

c) 15243

d) 21453

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

Questions 31-35. For each of the following sentences, please assess whether the underlined portion is grammatically correct. If it is, select option 'A'. If it isn't, please select the best option, 'B', 'C', or 'D' below.

31. A black market for foreign currency had mushroomed up to meet unsatisfied demand, making it extremely profitable to get your hands on cheap dollars sold by the state.

- a) had mushroomed up
- b) had marooned up
- c) had blossomed up
- d) had sprung up

32. Multiple sclerosis is an autoimmune disease that is caused by a victim's immune system turning on and destroying parts of his own body.

- a) turning on and destroying
- b) turning on and proliferating
- c) turning on extinguishing
- d) turning on and mitigating

33. Success is important to sustain women's football, already the fourth-largest team sport in England – measured by participation – after men's football, rugby and cricket.

- a) to sustain
- b) to appertain
- c) to preordain
- d) to coup de main

34. The United States is only two generations removed from the enterprise of segregation enforced by law in higher education.

- a) the enterprise
- b) the scourge
- c) the initiative
- d) the achievement

35. What inert the immune system to behave in this way remains mysterious, but in the 1970s researchers uncovered a promising clue when they noticed that MS is rarer near the equator than it is at high latitudes

- a) inert
- b) thrives
- c) paralyses
- d) drives

ALL ANSWERS MUST BE GIVEN ON THE ANSWER SHEET BY CROSSING THE CORRESPONDING LETTER

Questions 36-45. Each sentence below contains either one error or no error at all. Please select the option that indicates the error; if there is no error, select option D.

36. The concept of affirmative action was meant to assist in the healing process by mandating that

A

B

businesses make up for patterns of discrimination by hiring black workers at a certain proportion of

C

their workforce. No error.

D

37. The Chief Justice of Pakistan Saqib Nisar has disjoined Justice Ijazul Ahsan as the "monitoring

A

B

judge to supervise and monitor the implementation" of the Panamagate case. No error.

C

D

38. The Karachi Port Trust (KPT) has failed to provide the country's biggest Keamari port with proper

A

and permanent road connectivity even after a lapse of 10 years, causing frequent preternatural calm

B

C

over the Jinnah Bridge and the connecting arteries. No error.

D

39. Sindh Home Minister Sohail Anwar Sial applauded seven station house officers (SHOs) of the

A

provincial police in Karachi over their alleged failure to control street crime and misbehaviour with

B

complainants on Wednesday. No error.

C

D

40. The number of bank inaugurations in the metropolis has dropped significantly in the past two

A

B

years mainly due to proactive policing and ongoing Rangers-led operations, but the off-and-on strikes

C

by bandits remain a challenge for the investigators. No error.

D

EMBA Entrance Exam

Time: 1.5 hrs

Case Study: KoldKraft Pakistan: An Entrepreneurial Journey

Read the case study and answer the questions.

Note: This is a case study exam. You are encouraged to be creative in answering the questions.

1. Explain the entrepreneurial characteristics of Tariq. How did they evolve over a period of time? 10 points
2. What is the role of formal education in starting an entrepreneurial venture? Do you think an MBA will help and train you in this regards? 10 points
3. How did Tariq start his venture? What were the most important things i.e. finance, people or idea to start his business. 10 points

KoldKraft Pakistan: An Entrepreneurial Journey

Tariq was reflecting back on the entrepreneurial journey he had been through since his graduation from the University of Engineering and Technology, Lahore, Pakistan. Throughout his journey he had learned that the future is not only unknown, but unknowable. Still yet, he was able to shape this unpredictable future. Tariq started his career in a construction company followed by work experience at MTL (Millat Tractors Limited) and PEL (Pakistan Elektron Limited). The knowledge, experience and networks developed in his previous jobs enabled him to proceed with his own entrepreneurial venture i.e. KoldKraft Pakistan. The business though initially small, turned out to be a great success as he was able to create a new market which in turn helped him to find new opportunities. The new opportunities had brought with them new challenges and he was again faced with tough choices and wondering how to proceed further. The recent earth quake had opened a new market of low cost homes. The Government and various NGOs were looking for low cost and prefabricated houses for the victims. Tariq was in the business of cold storage manufacturing and could use the same technology and resources to manufacture them. Tariq was confident that KoldKraft will grow but he needed people who take ownership and responsibility.

This case was written by Research Associate, Ebraheem Aftab under the supervision of Dr Shahid Qureshi, Director Center for Entrepreneurial Development (CED), IBA Karachi to serve as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. This material may not be quoted, photocopied or reproduced in any form without the prior written consent of Institute of Business Administration Karachi, Pakistan

“The business has been stagnant for the last three years. In the earlier periods of slow growth, we had been able to pull through by diversifying the business from its core competence of refrigerated solutions, taking it everywhere there was a need. This time the circumstances appear to be quite different. Looking for possibilities, I have found opportunities to grow myself in unrelated areas i.e. low cost homes. But they lead away from the venture I have been working on for the last twenty five years. I am wondering whether this opportunity is in line with my core competencies and my team can handle the existing and new projects. It is very difficult to find people with that commitment and energy. This makes me reluctant in delegating responsibilities and is an impeding factor in growth.”

EARLY CAREER & BACKGROUND

Tariq Siraj Jafri completed his Bachelors in Mechanical engineering from the University of Engineering and Technology, Lahore, Pakistan in 1975. A few months prior to his graduation, however, Tariq had to make a decision that would mark the course of his career. Tariq had an interest for machines and was always curious how they work. This interest and curiosity led him to opt for a Mechanical Engineering degree. Beside Mechanical Engineering, his aspiration was to serve in the armed forces – much of which could be ascertained to the post war era of 1965. It was a matter of pride and great honor, and merely picturing oneself as a ranking officer was always exhilarating. At the time of admission into the engineering university in 1971, he qualified as a successful candidate for the military sponsored, BSc engineering program. Under this scheme, he had to join the army as a Captain upon completion of his degree. All of his education expenses were being paid, career path was quite set and he was confident and motivated on this great start.

Later the same year, the war of `71 broke. It lasted only for thirteen days but the impact had lasting repercussions. After the fall of Dhaka and specifically the POW (Prisoner of War) situation, there was a common demoralized attitude towards the armed forces. Tariq became skeptical of the career choice he had made for himself. Towards the completion of his degree, he lost interest in a career in the armed forces. It was not easy to resign from the program as he had to give a valid reason and to pay back the expenses that had been occurred on him. His financial circumstances at the time made it difficult to take the step. His father who had recently retired as a superintended of the General Post Office offered to pay for the expenses by commuting fifty percent of his pension. Either way, his decision had left him burdened.

After graduation, Tariq joined the National Construction Company (NCC). The company was incorporated in 1973 and placed under the administrative control of Housing & Works Division for handling sophisticated civil engineering projects at home and abroad. Tariq's first appointment was as a site engineer for the construction of the Pakistan Engineering Congress Building in Lahore, Pakistan. The job required working in a team of four engineers lead by a project manager. His core job responsibilities were to oversee the mechanical aspects of the project underway. As a fresh graduate, he focused on the know-how of his work.

I understood that the sound knowledge of work would be my key asset and in the initial days I kept quiet; closely observing and learning. And wherever I needed to, I would ask my project manager for guidance. I was never shy in doing so. If I did not know anything it only meant that I had not learnt it yet. I worked hard, forgetting that I was working on a nine to five job, and soon I found myself attached to the project as if it were my own.

One thing that was bothering Tariq from his early days at the site was the laid back attitude of the construction workers. Tariq could see that his project manager was always struggling and having a hard time motivating the workers to be more productive.

The day was overcast with clouds and the project manager had not come yet. The workers held up the construction, saying that it may rain any moment and it was of no use to start work today. Tariq knew that the weather would keep up this way, and if so the project would be falling behind schedule. He took up matters in his own hands and started forcing the workers to resume construction. Following this event, Tariq started making the environment more competitive and engaging for the workers. To do so he divided the workforce into teams and would set performance based challenges like races in building sections, backed by rewards. He would also hold cricket and kabaddi competitions during any period the work was being held up for any unavoidable reasons. Tariq's most visible achievement was in turning around the attitude of his workforce. There was a common sense of ownership in building the project which motivated the workforce and allowed the team to continue the work even for the extra hours to complete the objectives set for each week. The project was completed within seven months –well in time of the deadline. During the finishing phase of the project, Tariq was promoted to the project manager for a major project in Islamabad. Owing responsibility towards his parents, he turned down the offer and handed in his resignation.

Two days later Tariq joined Millat Tractors Limited (MTL) as an Assistant Manager in Quality Control. Although the immediate job required him to work on quality standards implementation along the assembly line for tractor parts, Tariq realized that his role was more of a middleman between the upper management and the labor union.

MTL was incorporated in June, 1964 under the name of Rana Tractors & Equipment Limited, succeeding James Finlay & Company. It was to introduce and distribute Massey Ferguson tractors and other farm equipment in Pakistan. An assembly plant was set up in 1967 to assemble tractors in semi-knocked down (SKD) condition. The company was later nationalized in 1972 and began assembling tractors on behalf of Pakistan Tractor Corporation, formed by the government for import of tractors in SKD kits. MTL operated as a unit of Pakistan Automobile Corporation (PACO) and later started manufacturing and using indigenized parts under the deletion program in 1981.

At the time Ehsanullah Khan (a senior bureaucrat) was the Managing Director of the company. Ehsan was a proponent of union activity as he believed that it leads to a dynamic industry. Even during the martial law regulations against any union activity, he encouraged union members in view of

improving production at MTL. There was a major clash between two opposing union groups. There had been a number of riots leading to injuries of members of the union. In an action by the upper management to coerce the situation, members had been fired from the organization. This had led to further labor agitation, followed by strikes and sabotage threats. The management maintained its stance on not to negotiate with such behavior, which led to increased political activity until a new union was elected. Given the circumstances, Tariq found himself divided between the management and the labor union and at situations felt pressured in taking sides. His role was to facilitate the bottom-up channel to lead the shop floor work force.

I knew that I had to establish myself as an authority before the labor union that they would identify with. I would sit with them, crack jokes during lunch break and work with them such that they'd be able to relate to me. I took due note of what the real issues were and would do my best to represent them. In time I gained their respect as a person who could be a bridge between management and them.

Working closely with the labor, Tariq's first achievement at MTL was to implement quality management systems. Tariq moved to the production line as MTL began manufacturing and sourcing parts locally under its indigenization plan. He worked closely with the senior management team in implementing different managerial concepts and played a key role in aligning the labor force with the redesigned production line and scheduling production activities. Gradually Tariq became more engaged in the manufacturing of parts –working actively with engineers and the labor force in developing creative solutions. He recalls this as the most enjoyable time of his stay at MTL and feels proud to play a pivotal role in transforming the work environment into a more collaborative and productive one.

Tariq left MTL to join Pak Elektron Limited (PEL). He had not planned to leave Millat Tractors; however it was the continued insistence of Mr. Agha Altamash a senior manager at PEL that led him to that decision. PEL was established in 1956 in technical collaboration with AEG of Germany. It is considered to be a pioneer in the manufacturing of electrical goods in Pakistan and had two division; power and home-appliances. The home appliances division was established in 1981 when it began manufacturing air conditioners in Pakistan. These early air conditioning units were manufactured in complete knocked down (CKD) condition, in collaboration with General Corporation of Japan. Within a year, the company began producing indigenized units with 232 out of 240 parts sourced through local vendors. The power division comprised of three plants: Energy Meters, Transformers and Switch Gears. It was also a prime manufacturer of electric motors earlier. The company was bought by the Saigol Group of Companies in October 1978.

Tariq joined PEL as a Senior Engineer in the Transformer section. His early task was to improve the efficiency of the production line. This involved redesigning various processes and streamlining the workers by developing improved protocols. His efforts proved to be useful in terms of reduced materials wastage and improved labor productivity. To do this however, Tariq found a friction

building up in his relationship with the section head, Mr. Usmani. A few weeks later, Tariq was appointed as a manager of a newly formed Development Section.

In the new job Tariq's responsibility was to solely look after projects that faced bottlenecks. His first task was to build a team. He recruited some workers that he had been working with in the past and moreover selected some people from a foundry that was being shut down. One of the first projects that Tariq and his team worked on was a defense contract, building a set of motors for the T59 Tank (Chinese industrial design: WZ120), commissioned by the Heavy Mechanical Complex (HMC), Taxila. During the following two months the team developed various types of motors, including the turret motor, self-starter motor, oil pumping motor and cabin fan motor. The process required building more than two hundreds parts. At the time of the final presentation to the client, the first test results did not appear to stand up to the requirements.

We were testing the torque generated by the motors at the HMC for their final approval. They seemed to be rotating slowly against the test load. Much to the approving committee's despair, I requested a second review. I went back and checked everything over again. I returned, confident that our product was up to mark. During the second review however, the results were no different. To this I asked the personnel at HMC to arrange for the OEM motors for the tanks. During another test run, we put the same load on the two sets of motors, it became clear that the testing load was not set right. In a comparison our manufactured motors proved to be far better –to the extent that original motors had failed to rotate the load.

After the success, the Development Section continued working on motors for commercial purposes, ranging from 1HP to 30 HP. The market was competitive and there was a fair demand. PEL was able to establish a significant share in the market, in competition with other manufacturers like Siemens.

In the early days of 1981, the Managing Director of the company, Mr. Zia Saigol began discussing the possibilities of manufacturing air conditioners in Pakistan. "He had just one question, can it be done?" In response Tariq immediately started to reverse engineer a National unit (a famous imported brand). In less than forty eight hours he had hand build a complete functional unit. He installed it in his office and asked the MD to come and see it. Saigol was much pleased with the presentation. In the following weeks Tariq visited the leading manufacturer such as Galletti, Westinghouse, Samsung, Mitsubishi, General, National across Italy, US, Korea and Japan. The objective was to begin the assembly of air conditioning units in Pakistan in CKD conditions.

After a thorough review of each manufacturer the team selected the units manufactured by General Corporation of Japan. The company agreed to work in collaboration with PEL, setting the unit price

of each knocked down kit at USD 350¹, whereas the price for the manufactured unit was USD 320. In the disclosure to indigenize the assembly under the five year deletion program in Pakistan, PEL agreed to retain business with General Corp. in terms of overall component volumes. Tariq lead the production of air conditioners and was responsible for establishing the vendor base in Pakistan as well. In less than a year, 232 of 240 parts were being manufactured in Pakistan with production of forty units per day.

During these months Tariq had worked closely and had been successfully developing a strong vendor base. He established production standards, provided support to vendors by collaborating PEL's production capabilities and was able to extend facilitation in imports under the company's duty exemption. The project had often required him to travel abroad to inspect special dies and other solutions made for vendors. In the process, he had earned himself a reputation in the industry.

THE STARTUP DECISION

Following his achievements at PEL, Tariq was offered promotion: a senior executive's position, with doubled salary, a decent car and attractive retention benefits. However, Tariq turned down the offer and handed in his resignation. It was a very good promotion, but Tariq felt that it was the right time to leave employment and to start his own venture –something he had been secretly aspiring for quite some time. He thought, "If he didn't leave now, it's probable that he never will. It would just keep lingering on". It was a difficult decision as his superiors suggested that he was a straight forward person and it would be difficult for someone like him to pursue an independent venture. At home, he had only been married for six months and his family opposed his decision as well. However he was so convinced about this opportunity that he told everyone that he would like to give it a try. In case of failure he would come back and give up any such pursuits.

Nearly five months prior to handing in the resignation, Tariq had acquired an area of 550 sq. yard in the Kot Lakhpat Industrial Estate, Lahore. He had been planning to start an engineering projects firm, but had not expected it to happen so soon. He had not found an opportunity to focus on yet, but was confident that he would be able to find some customers to begin with. He had built a reputation for himself and was counting on the network he had made while working at PEL.

In the early attempt to get things started, Tariq went to see the bank manager who usually dealt with his project concerns at PEL to open a letter of credit.

I had been sitting outside the manager's office for more than an hour. It was unusual and as the minutes passed by I could sense that I would be turned down, that day. Finally

¹ USD 1= Rs 9.90 in 1981

when I got to meet the manager, I explained him my concern. He asked me if I wanted tea or coffee. To his kind offer, I could sense a change in his usual tone and my earlier sense grew upon me. The manager told me that the bank would be happy to do business with me, but to open an LC, I would have to wait for one year. I left the bank awfully disappointed. I realized that many of the contacts that I had established while working at PEL would be of no use to me now. It would be more challenging than I had anticipated.

Tariq faced similar response from a number of suppliers he had been working with at PEL. In the stir of expectations, he continued to look for alternatives to arrange capital and took turn to the lesser formal networks. Tariq found the initial support of his elder brother Saleem. Tariq borrowed Rs. 340,000 and they both verbally agreed to fifty percent sharing of profits till he could payback the amount. As he continued to establish his network, he found some new suppliers with the help of a friend, who agreed to provide material on credit.

Tariq was able to get some smaller engineering projects and gradually started feeling confident about his capabilities. In time he was able to convince two of his former colleagues at PEL, Mr. Lawrence Harrison and Mr. Jaleel Ahmed to join him as partners. Lawrence had been with the Saigol Group for quite some time. He had been working as a commercial manager in the UAE, and had come to join PEL as it began manufacturing air conditioners. Tariq and Lawrence had been working alongside and enjoyed a good professional relationship. Jaleel was a finance manager and had often been part of discussions to start a venture in the PEL social circle. He only remained a partner in the business for some months.

The team had discussed to take up manufacturing of tractors parts, the vendor industry had developed quite rapidly over the recent years. With the help of some good references, they were able to setup a meeting with the representative of Ford Tractor. During the meeting Tariq and Lawrence found out that the window to the opportunity they were looking for had become quite narrow. Most of the parts to be indigenized had been taken up by other vendors already. The ones that remained were difficult to manufacture in Pakistan. In the list of these remaining parts were two components namely; rocker arm and clutch fork. The manufacturing of these two parts required nodular casting and malleable casting. Two fairly complex metallurgy processes at that time. This was the prime reason that the parts had not been taken up by any vendor yet. As soon as Tariq saw the two parts he realized that he might be able to get them made. He had worked extensively across the manufacturing industry in Pakistan during the indigenization campaign and felt that it was finally going to payoff in his new pursuit. Over the next ten days Tariq worked on developing the parts, travelling back and forth to the industrial districts in upper Punjab (Gujrat, Gujranwala, and Sialkot). After a few revisions of the sample, he was finally able to get the parts manufactured as per Ford standards and they were able to successfully sign a contract with the company.

It was a first step, but they had much more to do. From their experience with Ford, it had become clear that they would have to change their approach. The tractor parts industry or any other vendor

industry following the deletion program would become saturated, sooner than later. Moreover, to establish themselves as a prime business concern in any segment, they needed to work on an opportunity that was fairly new to Pakistan and would service a larger base –more than one industry in the economy.

Tariq did not have to wait too long for the new opportunity. In 1984, Prime Dairies was being established in Pakistan and needed a vendor to carry out the installation and commissioning work of its refrigeration unit. Tariq was offered to work on the project; much like the projects he was now receiving –mostly through the contacts and networks he had been developing in the past few months. He would take some, while leave others. “I focused on the projects where I knew I could deliver my best, and not on the ones I found more lucrative than the others”. Tariq found the Prime Dairy project appealing. It would perhaps lead him to the opportunity he and Lawrence had been looking for.

Tariq took the installation project and initially worked as a service vendor for Prime Dairies. During this time he began exploring opportunities specific to refrigeration and found that most of the units in Pakistan were being imported and had one common problem; they were not designed for the tropical climate of Pakistan. To this simple discovery, he started developing more localized and robust designs. As he developed more effective and tropical solutions, he gradually started introducing them in the market.

It had been six months that Tariq had been working closely, focusing on his one client – Prime Dairies. As the dairy business expanded he continued work on refrigeration and cold storage facilities. It was here that he found the single opportunity that led to the establishment of his successful business. Prime dairies had imported reefers and asked him to carry out the installation and commissioning of the reefers on the vehicle. During a discussion, the Prime dairy representative mentioned if such equipment could be manufactured in Pakistan. That was the precise opportunity Tariq had been looking for.

Prime dairies agreed to an order for one reefer as a trial and set strict requirements by benchmarking against the imported one. It was the break Tariq and his partner had been looking for. However they needed to raise capital for the project. The team sat down to figure out ways to do so, and when all options at hand were exhausted, Tariq went back to his client and disclosed his concern. He was able to negotiate a fifty percent advanced payment of total of Rs. 300,000² against the condition that if the vehicle did not fulfill Prime Dairies requirements, Tariq would have to pay the full amount and buy the truck from Prime Dairies.

² USD 1 = PKR 15.360 in 1984

Over the next few weeks the team at SECO worked around the clock to build a Reefer with the refrigeration and cooling capabilities suitable for Pakistan's climate and also having the structural integrity to withstand the harsh road conditions in the country. During this time they had come to learn that Ford was to shut down in Pakistan. Nevertheless, Tariq knew that he had found the opportunity at last, and continued to work on his project with a strong motivation. Upon delivery of the Reefer, Prime Dairies tested the vehicle for about ten days and came back with an order of six new vehicles. Tariq and his team had made their mark, and became pioneers in developing quality standard refrigeration solutions for logistics in Pakistan.

In 1985, Tariq restructured the business. He moved the facility to a new location of 550 sq. yards within the industrial estate and registered the company as KoldKraft Pvt. Ltd. It was the same year that he began receiving orders from other clients, including Polka for Reefers. From the very first day Tariq set the rule to not to compromise on quality. Their customers were looking for a one time investment, and KoldKraft had to be the name they would trust. He focused on building long term relationships and found value in growing with his clients.

In the last twenty five years the company has expanded into a business specializing in engineering, design, manufacture, installation and service of industrial and commercial refrigeration and process systems. The facility exists over an area of 6000 sq. yards and has more than 340 employees. It has clients ranging from dairies, poultries and agricultural cold storage to food and beverages, chemical, pharmaceuticals, hotel and restaurants –in both, local and international markets (see exhibit 1; a through d). The industrial cooling and refrigeration market was basically fragmented with many small players offering a variety of products and services. Quality was a big issue as there were few formally trained and skilled people and the tendency was to use cheap material from China.

PRESENT SCENARIO

The growth of the KoldKraft business was directly associated with the progress of the economy of the country. With the growth of existing businesses and opening up of new markets, KoldKraft has emerged as a prime solutions provider where ever there is a need for cooling solutions, for fixed and logistics purposes.

In the earlier periods of slow economy, KoldKraft continued growth by diversifying its product and services portfolio and taking the business to wherever there was need for cooling and refrigeration solutions Exhibit (1a and 1b). The current economic circumstances have however left the business quite stagnant. The company has introduced new equipment to be used in abattoirs. Similarly, it has brought in solutions for other segments such as fruit and vegetables storage, processing and export. However, introducing complete solutions for new segments has not stimulated enough growth to pull through the shift in circumstances since 2008.

In pursuit of expanding into new markets, much consideration has been given to any segments where tropical solutions may be needed. One such development project focuses on the rehabilitation of disaster affected areas by developing low cost homes that are energy efficient and have useful life of as much as twenty five years. Exhibit 2 encloses the schematics of modeled home, which can cost as low as PKR 1800 per sq. ft. In marketing the homes however, the usual bidding channels prove to be off-putting. Many players in the market are able to offer much lower prices, however a thorough review reveals discrepancies in the structure and substandard quality as many of the players are often focusing on a one time sale.

In terms of reducing costs, the team had been discussing the pros and cons of installing a semi-automated production facility to bring economies of scale. The first phase of the automation would cost approximately 2 million rupees and was estimated to increase the production by three folds, and bringing down the overall production cost by 30%. However, given the sluggish growth, there was a risk of that the investment might not recover in the near future.

There were a number of vendors in the market offering similar products. Most of the solutions could be developed by importing parts mostly from China and assembling them locally. In this way the local firms are able to offer lower prices. Most of the employees who have left KoldKraft tend to offer such projects. In contrast, KoldKraft has retained its position as the sole manufacturer of refrigeration units specially designed for the tropical climate and road conditions in Pakistan. The foreign manufactured units are built for a temperature range from 38C to 45C. KoldKraft manufactures units which work pretty fine in temperatures as high as 55C. The robust designs, high quality and after sales service has established KoldKraft as the premium service vendor in the industry.

Over the past 25 years, KoldKraft has established a premium reputation in the market. In pace with the economy, the business is expected to grow as the economy picks up. Tariq's original idea has grown in to a big opportunity. He is very optimistic that the business can grow in the future. But at the same time too much diversification has created new challenges. The growth and diversification requires lot of human and financial capital.

Reflecting back on his entrepreneurial journey, Tariq wondered if this was the right way to move from one business idea to another to discover what would make KoldKraft to be sustainable and successful in the future. Tariq is confident that KoldKraft will grow but he needs people who take real ownership of each single project. It is very difficult to find people with that commitment and energy. This makes him reluctant in delegating responsibilities. This attitude is impeding the growth of his firm. Although his son has recently joined him after completing his Masters in Mechanical Engineering from Cranfield University, UK, he still feels reluctant in relinquishing control.