

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27
MID-SEMESTER TEST – AUGUST 2016
M.Sc MATHEMATICS - III SEMESTER
MT OE 9616 - Making the Right Decision

Time: $1\frac{1}{2}$ hrs

Maximum marks-35

Answer all SEVEN of the following questions

(7 x 5 = 35)

1. It's been three decades since the plague that is AIDS first appeared, but finally there is some really good news: a research lab in your international pharmaceutical company has developed a cure. Instead of announcing it to the world, though, you've kept a really tight lid on the project, because a very peculiar fly has buzzed into the ointment (actually, it's in the genetically engineered intravenous injection that you have developed)—this particular cure works only on people with type O negative blood. Your scientists have spent nearly six months trying to get past this obstacle, and they've improved the success rate for other blood types, but there's still a huge disparity between how well it works on people with type O negative blood and how well it works on everyone else. Word of this has started to leak out, there have been bloggers speculating on developments in this area, and it looks like you're going to have to make some sort of move. Should you
- A. spend some more time trying to develop a cure that works independently of blood type?**
B. patent the formula as is?
C. release your findings, make the formula public property, and simply manufacture the formula and market it?

State the reasons for your choice, reasons for rejecting the other two and the criteria you used.

2. Your father, Henry Ford, founded the Ford Motor Company, and after he handed the reins over to you, Ford continued to be one of the Big Three, the leading car producers in the United States. You wouldn't mind consulting him for guidance, but he passed away nearly thirty years ago, and so it's up to you to make the call on this one. A year before your father died, a bright young engineer named Lee Iacocca joined the company and quickly turned into one of its driving forces. He was responsible for your highly successful Mustang, and he's done a terrific job as Ford's president. But you're the CEO, and you just can't stand the man. He's modern, you're traditional, he's Italian, you're Anglo-Saxon—and a whole bunch of other things that he is, you're not—and vice versa. Should you
- A. bite your lip and let sleeping dogs lie?**
B. promote him sideways by offering him inducements to take over the underperforming European branch of Ford Motors?
C. fire him?

State the reasons for your choice, reasons for rejecting the other two and the criteria you used.

If you use an alternate payoff system what would be your decision?

3. You are familiar with the saying "the more the merrier," but you are Sir Thomas More, and at the moment you are far from merry. To say the least, your career up to this point has been illustrious. You have been a successful lawyer, you authored the

wildly successful satirical novel *Utopia*, you were a successful diplomat, and then your star began to rise! You were knighted and made a member of the Privy Council. In 1529, King Henry VIII made you lord chancellor, the first layman ever to hold that position. Unfortunately, your relationship with Henry VIII started to deteriorate, in part because of his behaviour and in part because of your stalwart Catholic beliefs. Henry wanted a divorce from Catherine of Aragon, and you could not in good conscience support this challenge to the authority of the pope. In 1532, you resigned the chancellorship, and things have gone from bad to worse. Henry wants you to sign the oath of adherence to the Act of Succession, asserting that Anne Boleyn's children (not Catherine of Aragon's) have the right to the throne. If you fail to sign, you will be charged with treason and probably executed. You are caught between the frying pan of Henry's anger and the (possibly eternal) fire that awaits you if you disobey the pope. Is your best course to

- A. refuse to sign the oath on the grounds that, according to your beliefs, it would jeopardize your immortal soul?
- B. try to persuade Henry to reword the oath to enable you to pledge loyalty to the king?
- C. sign the oath to avoid trial and possible execution?

State the reasons for your choice, reasons for rejecting the other two and the criteria you used.

If you use an alternative payoff system what would be your decision?

4. Write a case study illustrating the various principles of decision theory.
5. Read the following article .
what options will you bring to the decision table to address the issue and what is your decision if you use
 - a) Minimax criterion
 - b) Bayes' criterion
 - c) Maximax criterion

India retires hurt (JINOY JOSE P July 27, 2016: Business Line)

A match report?

Of a different kind. The case in point is the latest Global Retirement Index (GRI) prepared by Natixis Global Asset Management, a Paris-based company, which basically tells you India is one of the worst places in the world for life after retirement.

That's surprising!

The Natixis Index has ranked 43 important countries, and India sits at the bottom. The list has 34 countries from IMF's advanced economies, five from the OECD and four from BRICS, which India is part of.

So, who're the toppers?

Norway, Switzerland and Iceland are among the top three. The US is in 14th position. In fact, this time Natixis scanned only 43 nations, as against 150 last year. Also, this year, the researchers considered the five-year average of real interest and inflation rates, against a three-year average last year.

Does that mean those who retire in India are left with less — or even zip — savings?

Indeed. Most earn much less and save less. India's working population doesn't enjoy enough safety measures and contract jobs are rising alarmingly, ripping workers of benefits and

welfare. Nor does India have a strong law on minimum wages. This makes life in the informal sector a nightmare.

Juxtapose that with the country's abysmal social security track record and you get a suitably grim picture. Mind you, the number of Indians aged over 60 have reached a record peak. The elderly now account for 8.6 per cent of our over-120 crore population. In April this year, a report by the statistics ministry said that the number of citizens over the age of 60 jumped 35.5 per cent — from 7.6 crore in 2001 to 10.3 crore in 2011, a record since 1950. It is almost twice the rate (17.7 per cent) at which the total population grew.

Another report notes that half of India's elderly population lives below the poverty line. Now, that's cause for worry.

Absolutely!

HelpAge India, a nonprofit, estimates that the number of the elderly will cross 1.4 crore by 2021, and by 2050 will account for 20 per cent of the population. This slice of stats should be an eye-opener for policymakers. Clearly, social security measures for the aged and the retired need considerable changes.

What matters most is healthcare, I guess.

You bet! India's performance in the GRI's sub-index for health — 4 per cent — was the worst among the 43 nations it studied. Also, India has the lowest ranks for health expenditure per capita, non-insured health spends, and life expectancy out of all countries measured this year. The report says people in urban India have greater access to adequate healthcare services, but a massive chunk of the rural population is still denied basic healthcare.

Yeah, in many villages, quality of life is a myth.

In the GRI, India ranks last in the quality of life sub-index, too; it comes second-last in finances in retirement and third-last in the material well-being sub-index. Within quality of life, we have the second-worst score for biodiversity in the entire GRI and the worst scores for air quality, happiness, and water and sanitation. Low scores in air quality and environmental indicators reflect high levels of water and air pollution in large cities.

This is bad! What do we do?

To figure that out, the GRI notes that each topper provides solid best practices for ensuring retirement security. The report highlights four core trends for policymakers. These include ensuring access to alternative saving methods, offering tax incentives for retirement savings, ensuring workers have the right balance of investments and education, and having the right mix of economics by enhancing monetary, fiscal and healthcare policies.

6. Read the following article .

With this information, what options can you suggest to win the election if you are

- a) Hilary Clinton
- b) Donald Trump
- c) Indian American
- d) Indian

Indian Americans sleeping giants in US presidential election:
Frank Islam (July 27, 2016: Economic Times)

PHILADELPHIA: Indian Americans are "sleeping giants" and can make a "significant difference" in helping first ever woman US presidential candidate Hillary Clinton break the ultimate glass ceiling, according to her Indian origin supporters. "Indian Americans are the sleeping giants. Indian Americans in this campaign need to harness and galvanize the resources especially in the battle ground states of Ohio, Pennsylvania, Florida and Virginia," said Indian American Frank Islam, a major fund raiser for the Clinton Campaign. "I

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personally believe and Hillary (Clinton) believes that they can make significant difference, if the people go out and vote," said Islam who was present at the Democratic National Convention in Philadelphia where Clinton was nominated. He said if the Indian Americans would go out and vote in these battle ground States they can play an "important role" and tip the ballots. Islam, who was part of the delegation to travel to India with US President Barack Obama in January last year, exuded confidence that Clinton as president would take India US relationship to the next height. "She would be indispensable partner for India. She would advocate and embrace what President Obama has done so far," he said. "I was so happy to be there at the historic moment when Hillary became our nominee. She has potential to lead the nation. What is important as an Indian American is that Hillary is focused on building bridges. She will go beyond all differences and unite people," said Palaniappan Andiappan, who was a member of the Credentials Committee. Andiappan attended the Democratic National Convention, saying it was a "very energizing and electrifying experience." "Hillary Clinton's nomination sends a powerful message that the America's major party is ready to give command of the most powerful nation to a woman. Her message of unity and holding each other resonates with majority of Americans," said Rajwant Singh, a Sikh community leader. Noting that Clinton as the Democratic presidential candidate provides assurance to minorities especially the religious ones, Singh said Sikhs are pleased with nomination as she has been a long time friend of the community. "She has stood by the Sikhs during the challenging times in the aftermath of 9/11. She has spoken emphatically that nobody should be made target of hate and this is exactly the kind of leadership is required to lead this nation," he said. New York based Indian American attorney Ravi Batra said US President Barack Obama in his speech at the convention "recaptured America's election away from Trump's Terms of Fear and Hate and back to the Audacity of Hope for all of the people."

7. Read the following article .

With this information, what options will you bring to the decision table (stating your payoff in each case) if you are

- a) a Politician
- b) a CEO of a company
- c) a Policy maker for the government institutions
- d) a Teacher

Diversity clearly makes a difference (REKHA SETHI July 29, 2016 Business Line)

Diversity remains a sensitive issue even in an urbanised and globalised world. Though there is growing acceptance of the inevitability, even desirability, of social diversity, leadership continues to be the preserve of those from privileged groups and the privileged gender.

Notwithstanding the commonly accepted correctness of equal opportunity and meritocracy, diversity does not come easy. People are hardwired to herd with those who look, speak and behave like themselves or belong to the same gender, region, religion, class or caste. But no country or company has prospered through homogeneity. It has always been profitable to gain from the intellectual, commercial and technological capital of the different and the outsider.

The lack of diversity in companies, especially at the decision-making level, remains a major issue everywhere in the world. According to a multi-continent study by McKinsey in 2014, women were only 16 per cent of the senior executive teams in the US, 12 per cent in the UK, and a mere 6 per cent in Brazil. Also, only six CEOs of the Fortune 500 companies in the US were African-Americans in 2015. In India, the concentration of business ownership and top management positions among a few social groups is only too obvious. Also, men occupy more than 90 per cent of the board positions in India's listed companies.

Same's no good

Such homogeneity is bad for business in globalised economies, particularly during low growth periods. At a time when companies could use new markets and radically new ideas and innovations, homogenous boards continue to recycle the same old thinking. The fraternity-based boards have low capacity for disruptive thinking because of the similar beliefs and experiences of their members. Diverse boards prevent sterile consensus and they tend to drive companies to renew themselves.

Globally, many studies have established a correlation between diversity and corporate performance. The management diversity study by McKinsey in 2014 concluded that diversity was a competitive differentiator and shifted market share towards more diverse companies. The study showed that the US companies with higher gender, ethnic and racial diversity in top management and boards earned 1.1 per cent higher EBIT and the UK companies with greater diversity had 5.8 per cent higher EBIT. In the US, for every 10 per cent increase in ethnic diversity in executive leadership, the EBIT improved by 0.8 per cent, the study revealed.

Gender diversity also has a significant bearing on corporate performance. According to a Grant Thornton study on relative performance of companies with women on board and those without, the NSE CNX 200 companies with women directors did better in 2014-15. The companies with men-only boards suffered \$14 billion in opportunity cost, the report said. A Korn Ferry study of the 100 largest listed companies in 10 Asia-Pacific countries, including India, concluded that in 2015 the companies with more women on their boards were more profitable — the companies with at least 10 per cent women directors delivered 14.9 per cent return on equity while the companies without women directors delivered only 12.6 per cent ROE.

Diversity of the board is critical to see beyond the familiar, do things differently and also look for new things to do. Directors with diverse backgrounds and affiliations bring fresh knowledge and perspective to the decision-making table. For example, women directors can provide a very different perspective of the market and work dynamics, and directors from different regions or expertise can open windows to new opportunities and different ways of doing things.

Importantly, diversity does not allow casual consensus and ensures greater scrutiny of strategies and performance. Having women directors is particularly helpful in preventing adventurism, as women tend to care more about preserving the company. According to a study by Leeds University Business School, the chances of a company going bust are reduced by one-fifth if there are women on the board. In global companies, only diverse boards can appreciate nuances of different markets and avoid the costly one-size-fits-all strategies.

No room for tokenism

However, diversity is easier desired than done. Merely appointing the odd woman or people from different backgrounds or experts from other fields does not do it. Tokenism can be counterproductive, as diversity without meaningful empowerment may just maintain status quo while rendering decision-making more tedious. Also, appointing friends and acquaintances to achieve diversity tends to produce sub-optimal results, as the obligated members would avoid challenging their benefactors. Therefore, Diversity makes sense only if the incumbents show courage and imagination in diversifying the board and the top management.

The new business realities do not tolerate clubby or tribal decision-making. The smart companies realise that they will lose to the more diverse competitors and they are spicing up their boards with more variety.