Section 1: Reading Comprehension

Invisible innovation

Excerpts of speech by Prof. Nirmalya Kumar at TED

Could India become a source, or a global hub, of innovation? Initially, or, you know, in fact the more aggressive people who are supporting the Western innovative model, say, "Where are the Indian Googles, iPods and Viagras, if the Indians are so bloody smart?" When you ask this, you are taking a particular perspective on innovation, which is innovation for end users, visible innovation. Instead, innovation, if you remember, famous economist Schumpeter said, "Innovation is novelty in how value is created and distributed." It could be new products and services, but it could also be new ways of producing products. It could also be novel ways of organizing firms and industries.

So, we realized that maybe we had the wrong question, and the right question is, really, can Indians based out of India do innovative work? Once you take this, there's no reason to restrict innovation, the beneficiaries of innovation, just to end users. When you take this broader conceptualization of innovation, what we found was, India is well represented in innovation, but the innovation that is being done in India is of a form we did not anticipate, and we called it "invisible innovation." And specifically, there are four types of invisible innovation that are coming out of India.

The first type of invisible innovation out of India is what we call innovation for business customers, which is led by the multinational corporations. In the last two decades, there have been 750 R&D centers set up in India by multinational companies employing more than 400,000 professionals. Now, when you consider the fact that, historically, the R&D center of a multinational company was always in the headquarters, or in the country of origin of that multinational company, to have 750 R&D centers of multinational corporations in India is truly remarkable.

When we went and talked to the people in those innovation centers and asked them what are they working on, they said, "We are working on global products." They were not working on localizing global products for India, which is the usual role of a local R&D. They were working on truly global products, and companies like Microsoft, Google, AstraZeneca, General Electric, Philips, have already answered in the affirmative the question that from their Bangalore and Hyderabad R&D centers they are able to produce products and services for the world. But of course, as an end user, you don't see that, because you only see the name of the company, not where it was developed.

The other thing we were told was, "Yes, but, the kind of work that is coming out of the Indian R&D center cannot be compared to the kind of work from the U.S. R&D centers." So we compared the patents of R&D centers in the U.S. with R&D centers in India of the same company to find out what is the quality of the patents filed out of the Indian centers and how do they compare with the quality of the patents filed out of the U.S. centers? By the way, the way we look at the quality of a patent is what we call forward citations: How many times does a future patent reference the older patent? . What we find is that the data says that the number of forward citations of a patent filed out of a U.S. R&D subsidiary is identical to the number of forward citations of a patent filed by an Indian subsidiary of the same company within that company. So within the company, there's no difference in the forward citation rates of their Indian subsidiaries versus their U.S. subsidiaries.

The second kind of invisible innovation coming out of India is what we call outsourcing innovation to Indian companies, where many companies today are contracting Indian companies to do a major part of their product development work for their global products which are going to be sold to the entire world. For example, in the pharma industry, a lot of the molecules are being developed, but you see a major part of that work is being sent to India. For example, XCL Technologies, they developed two of the mission critical systems for the new Boeing 787 Dreamliner, one to avoid collisions in the sky, and another to allow landing in zero visibility. But of course, when you climb onto the Boeing 787, you are not going to know that this is invisible innovation out of India.

The third kind of invisible innovation from India is what we call process innovations, because of an injection of intelligence by Indian firms. Process innovation is different from product innovation. It's about how do you create a new product or develop a new product or manufacture a new product, but not a new product itself? Only in India do millions of young people dream of working in a call center. What happens — You know, it's a dead end job in the West, what high school dropouts do. What happens when you put hundreds of thousands of smart, young, ambitious kids on a call center job? Very quickly, they get bored, and they start innovating, and they start telling the boss how to do this job better, and out of this process innovation comes product innovations. For example, 24/7 Customer used to be a traditional call center company. Today they're developing analytical tools to do

predictive modeling so that before you pick up the phone, you can guess or predict what this phone call is about. It's because of an injection of intelligence into a process which was considered dead for a long time in the West.

And the last kind of innovation, invisible innovation coming out of India is what we call management innovation. It's not a new product or a new process but a new way to organize work, and the most significant management innovation to come out of India, invented by the Indian offshoring industry is what we call the global delivery model. What the global delivery model allows is, it allows you to take previously geographically core-located tasks, break them up into parts, send them around the world where the expertise and the cost structure exists, and then specify the means for reintegrating them. Without that, you could not have any of the other invisible innovations today.

So, what I'm trying to say is, what we are finding in our research is, that if products for end users is the visible tip of the innovation iceberg, India is well represented in the invisible, large, submerged portion of the innovation iceberg.

1. Why does the author use the term "invisible" to describe innovations from India?
   (a) Innovations from India cannot be touched and felt.
   (b) Innovators of Indian origin are based out of India and the companies they work in are headquarters in USA.
   (c) Visible innovations need to be used by the end users.
   (d) Innovations on India are not directly known to or used by the end users of products.

2. An Indian subsidiary call centre of a US headquartered firm has developed a machine learning-based software that directs a customer call to the most suitable customer executive. The software is part of a global product that is being delivered by the company, across the globe. According to the speaker, which types of innovation would this best fit:
   (a) Process innovation
   (b) Management innovation
   (c) Both (a) and (b)
   (d) Visible innovation

3. Yes, but, you know, the kind of work that is coming out of the Indian R&D center cannot be compared to the kind of work that is coming out of the U.S. R&D centers. Considering the analysis, the authored carried out, how did the authors interpret "cannot be compared"?
   (a) Work from Indian R&D centre is of a different type than U.S. R&D centers.
   (b) The quality of work from Indian R&D centre is superior or inferior to that of U.S. R&D centers.
   (c) Indian R&D centre files far less patents that US R&D centres.
   (d) Indian do more invisible innovation than the US.

4. Based on what the author says about call centres in India, what can we say about the process innovation from India:
   (a) Highly talented people engaged in processual work.
   (b) No products being developed from India.
   (c) Not enough visible innovation work for smart people in India.
   (d) The people who can do visible innovation do not work in India.

5. Why does the speaker call "innovation for business customers" as invisible innovation
   (a) Multinational companies in India are working on global products.
   (b) Multinational companies in India headquarters are in US
   (c) Multinational companies in India are developing products that do not mention where they are developed.
   (d) The business customers do not think of these as innovation.

Collective Intelligence
Based on a report by Nesta

From the climate crisis to the displacement and migration of human groups, the 21st century has been defined by the rise of increasingly complex problems. Unlike simple problems, which follow more predictable trajectories and have obvious fixes, making progress on these complex problems requires dealing with uncertainty and multiple unknowns, where there isn't just one optimal solution. This makes them ripe candidates for collective intelligence (CI).

At its simplest, CI can be understood as the enhanced capacity that is created when people work together, often with the help of technology, to mobilise a wider range of information, ideas and insights. CI draws on a combination of data, technology and diverse human skills to address different aspects of uncertainty and complexity. CI emerges when individual contributions are combined to become more than the sum of their parts for purposes ranging from learning and innovation to decision-making. CI covers a wide range of participatory methods, including crowdsourcing, open innovation, prediction markets, citizen science and deliberative democracy. Some of them rely on competition, while others are built on co-operation; some create a sense of community and teamwork, while others operate on the basis of aggregating individual contributions or microtasks.

Artificial Intelligence (AI) models are most useful where a 'ground truth' is well defined and the data sources that the AI model uses as input do not frequently change. However, in the case of many complex real-world problems, like health epidemics and extreme weather events, the dynamics of the situation might lack historical precedent. This issue can result in 'dataset drift', which means that the data a given model was trained on is no longer equivalent to the real-world situation in which it is used, so there is no guarantee that the model's predictions will be accurate. When it comes to high-stakes decision-making, this inaccuracy can be dangerous. In these circumstances, CI harnesses the human ability to adapt to new situations, understand context and update knowledge fills in the data gaps of machines.

At the collective level, attributes of human intelligence include the ability to tell collective stories as an act of sense-making and learning. For example, Decode Darfur – an initiative run by Amnesty International for their distributed volunteering community, Amnesty Decoders – asked participants to identify areas of destruction in the settlements of Darfur using satellite images. Apart from demonstrating group accuracy, the project provided an opportunity for the volunteers to discuss what they were seeing as an act of 'collective articulation of experience'. It is difficult to imagine smart machines taking on this role and yet, when faced with societal challenges, having platforms for discussing and shaping collective values in this way is important.

One of the most important principles to help groups become more than the sum of their parts is diversity. For example, gender diversity helps smaller groups to improve their problem-solving ability and that cognitive diversity is vital for creativity and learning in workplace teams. The principle holds even when it comes to larger-scale CI efforts, where it may intuitively seem that diverse contributions could make it harder to distinguish signal from the noise but that's not the case. This is because the 'wisdom of crowds' relies on everyone making mistakes in slightly different ways. For example, in crowd predictions, if some people have a tendency to overestimate, while others are more likely to underestimate, overall their errors cancel each other out, making collective estimates more robust to interference from individual biases.

Realising the benefits of a group's diversity is only possible when there are effective mechanisms for people to access information and skills. The rules governing how group members interact with one another impacts how easily ideas spread and take hold in the group. The structure of a community network can play an important role in determining whether a group is able to exchange information efficiently. CI also relies on having shared open repositories of knowledge, accessible to old and new members alike. Well-known online platforms like GitHub or Wikipedia are often used by communities to document their processes. These function as a source of collective memory, and their absence can lead to the repetition of old mistakes over time.

Common Voice - a Mozilla initiative - is an example of how a CI approach to data collection can be used to improve the development of AI. The cost of developing speech recognition and other software that relies on voice data in smart devices is prohibitively high. There is also little transparency about what data has been used to develop smart assistants, meaning that certain populations can remain underserved. These limitations make the technology less effective for some groups, such as non-native speakers with accents, or for languages spoken by small populations.

Common Voice addresses this challenge by developing the world's first open-source voice dataset and a speech recognition engine. Common Voice crowdsources voice contributions through an online platform where users are invited to record themselves reading sentences. All sentences are sourced from texts that are under a Creative Commons license, to ensure they can be freely reused by researchers and entrepreneurs in the future. Users can also listen to and validate the contributions from others to ensure that the data is of high enough quality to train an AI algorithm. The market's leading voice technologies are powered by deep learning algorithms, which can require up to 10,000 hours of validated data to train.

As of January 2020, users have recorded almost 2,500 hours of their voices in 29 different languages for Common Voice. The aim of the project is to ensure that the data used to train voice recognition tools represents the full diversity of real people's voices. Each data entry contains an audio file with the linked text, as well as any associated metadata about the contributor, if it is available. By making the datasets open, Mozilla is creating opportunities for a wider range of researchers, developers and public sector actors to develop voice technologies that can benefit a wider range of people. This accessibility can help to incentivise innovation and healthy competition for better tools.

6. Which of the following most closely describes why Common Voice may not fully harness the potential of CI?
   (a) Eventually Mozilla may ask users to pay to be able to use the technology in their softwares.
   (b) The very people who are underrepresented may not know about the project or may have not have access to technology to record their voice. This may not create the diversity that is needed for CI.
   (c) The software may crash as a large number of users record.
   (d) Large companies can pay Mozilla to only collect a certain kind of voices that might help the products they develop.

7. Which of the following is the closest meaning of the term 'ground truth' as it is used by the author?
   (a) An analysis of opinions of all stakeholders
   (b) A comprehensive review of historical archives
   (c) Ethics of media outlets
   (d) Broad congruence between actual conditions and existing datasets

8. What do the authors mean by "wisdom of crowds"?
   (a) In a large enough sample, errors will be diverse and cancel each other out.
   (b) If the sample is large, the errors will be less compared to the overall sample size.
   (c) Decisions based wisdom relies on more than just data.
   (d) In large sample, people rely on wisdom and make less errors.

9. Why is CI better suited than AI for tackling COVID situations?
   (a) Data needed for AI may be harder during COVID.
   (b) No historical precedence or data about COVID is available that are needed for AI.
   (c) People affected by COVID may know more and better than what data can capture.
   (d) None of the above.

10. Which of the following is not an important condition for diversity to work for CI?
   (a) There are effective mechanisms for people to access information and skills
   (b) Participating people have open access to the same platform.
   (c) There is a shared open repositories of knowledge that is accessible to everyone.
   (d) Each participant can have a repository of her/his own memory.

11. In the case of Decode Darfur, the authors say: "It is difficult to imagine smart machines taking on this role". What is the role that the authors are referring to
   (a) Collecting and analysing large volume of data.
   (b) Discussing and debating to arrive at a collective opinion.
   (c) Combining qualitative descriptions with factual data.
   (d) Filter out fake information from correct ones.

12. Which of these is not a participatory method that CI relies on ?
   (a) Open innovation.
   (b) Deliberative democracy.
   (c) Prediction markets
   (d) Open markets

Extracted from Joshua P. Howe (2014) Behind the Curve, University of Washington Press, pp: 6-8

It is tempting to answer questions about why society has failed to deal with climate change by pointing at government officials, skeptical scientists, oil industry lobbyists and executives, conservative politicians, and financial institutions that have opposed and often undermined scientific research and congressional legislation since the issue first appeared on the public radar.[FN] The opposition is certainly out there, and as Naomi Oreskes and Erik Conway have shown in their study of the contrarian scientists involved in setting climate change policy for the Ronald Reagan and George H. W. Bush administrations, their influence has been real and pernicious.[FN]

But powerful and vocal as opponents of global warming policy have been since 1990, this political opposition has mostly reacted to the history of climate change. From the beginning, it has been the groups of people most interested in studying and mitigating CO2 —climate scientists, environmentalists, and a few politicians, government bureaucrats, and diplomats—who have set the terms of the debate. To borrow and retool a model of peasant resistance proposed by James C. Scott, in the history of global warming the structures of scientific research and political advocacy have helped define the structures of scientific and political resistance.[FN] Our collective failure on global warming has as much to do with the ways that scientists and environmentalists have approached and presented the problem as with how their opponents have resisted possible solutions.

Our collective social and political failures on global warming stem in part from the primary and sometimes exclusive focus on science in global warming advocacy. Since anthropogenic climate change first emerged as a potential environmental problem in the twentieth century, scientists, environmentalists, and politicians have consistently prioritized scientific information over social or political change. As a result of their science-first approach, scientists have made tremendous strides in their understanding of CO2 and climate change. But this narrow focus has shaped a broader political conversation that is also primarily scientific, and here the primacy of science has at times forestalled meaningful political and moral engagement with the problem. To the extent that climate change discourse continues to revolve around science and has failed to generate real political change, advocates' science-first approach has actually undermined many of their objectives. In narrative terms, their story fits the familiar form of a tragedy.[FN] This is a big claim, and it is important to begin with a sketch of how the tragedy—and the argument—works.

The tragedy of global warming begins with the intangible nature of the problem itself. The Keeling Curve shows that CO2 is rising, but you cannot see CO2 . You cannot hear how 43 percent of the CO2 released by the burning of fossil fuels mixes with and resides in the global atmosphere, and you cannot touch the way in which that extra CO2 absorbs and reradiates energy from the sun.11 You cannot smell the subsequent increase in global mean temperature; and though you may be able to taste the Valencia oranges that will grow in Oregon two decades from now, their sweetness and geographical novelty can taste like global warming only if you associate those oranges with processes that occur on geographical and temporal scales that are unavailable to your senses.[FN] Twenty-first-century Inuit and Micronesians whose lands and livelihoods are disappearing due to melting sea ice and sea-level rise will confirm the reality and immediacy of the impacts of anthropogenic climate change, but these impacts have not been apparent throughout the majority of the history of global warming.[FN] Even now, understanding these environmental challenges requires understanding the global processes that transcend our immediate relationship with the world.

That is not to say that we cannot or do not engage intellectually with global processes and global spaces. We do. But when we encounter climatic change in terms of the processes of the global atmosphere, our experience is almost always mediated by science. Historically, only scientists have had the expertise, the technologies, and the language to understand and communicate the phenomena of this global space. To the extent that environmentalists, politicians, and the public understand global warming and the global atmosphere in these issues' geographical totalities, they understand them in the language of science. To paraphrase climate science historian Paul Edwards, scientific models are the only way any of us really know anything about global warming.[FN]

13. According to the author, society has failed to deal with climate change because of:
    (a) Sceptical scientists and oil industry lobbyists.
    (b) politicians, bureaucrats and their interests.
    (c) uncertain nature of scientific knowledge.
    (d) Climate change narrative being exclusively structured around science.

14. Why is it problematic to give primacy to science in shaping the climate change debate?
    (a) Because climate science is uncertain.
    (b) Scientific exclusivity forestalls any meaningful political and moral engagement with the problem.
    (c) The need for investments in climate science.
    (d) Scientists have not made much progress in their understanding of climate change.

15. Why does the author call the narrative issue in climate change 'the tragedy of global warming'?
    (a) Because climate change cannot be stopped.
    (b) Because we cannot see CO_2
    (c) Because of the intangible nature of the climate change problem which is brought to our attention only by scientific tools.
    (d) Science is uncertain.

16. What is the author's argument in the passage?
    (a) Climate change science is wrong.
    (b) Engaging with climate change exclusively through the narrative of sciences has limited political and moral engagement with the problem.
    (c) We need more scientific evidence to convince politicians and climate sceptics of the reality of climate change.
    (d) Lived experiences of climate change may be pleasant. For instance, climate change might result in cold state like Oregon in the USA to grow Valencia Oranges.

Extracted from Leo Marx (1964) The Machine in the Garden, Oxford University Press, pp: 4-5

The notion that pastoralism remains a significant force in American life calls for an explanation. At first thought the relevance of the ancient ideal to our concerns in the second half of the twentieth century is bound to seem obscure. What possible bearing can the urge to idealize a simple, rural environment have upon the lives men lead in an intricately organized, urban, industrial, nuclear armed society? The answer to this central question must start with the distinction between two kinds of pastoralism— one that is popular and sentimental, the other imaginative and complex.

The first, or sentimental kind is difficult to define or even to locate because it is an expression less of thought than of feeling. It is widely diffused in our culture, insinuating itself into many kinds of behavior. An obvious example is the current "flight from the city." An inchoate longing for a more "natural" environment enters into the contemptuous attitude that many Americans adopt toward urban life (with the result that we neglect our cities and desert them for the suburbs). Wherever people turn away from the hard social and technological realities this obscure sentiment is likely to be at work. We see it in our politics, in the "localism" invoked to oppose an adequate national system of education, in the power of the farm bloc in Congress, in the special economic favor shown to "farming" through government subsidies, and in state electoral systems that allow the rural population to retain a share of political power grossly out of proportion to its size. It manifests itself in our leisure-time activities, in the piety toward the out-of-doors expressed in the wilderness cult, and in our devotion to camping, hunting, fishing, picnicking, gardening, and so on. But there is no need to multiply examples; anyone who knows America today will think of many others.

Nowhere is the ill-defined feeling for "nature" more influential than in the realm of imaginative expression. There can be little doubt that it affects the nation's taste in serious literature, reinforcing the legitimate respect enjoyed by such writers as Mark Twain, Ernest Hemingway, and Robert Frost. But on the lower plane of our collective fantasy life the power of this sentiment is even more obvious. The mass media cater to a mawkish taste for retreat into the primitive or rural felicity exemplified by TV westerns and Norman Rockwell magazine covers. Perhaps the most convincing testimony to the continuing appeal of the bucolic is supplied by advertising copywriters; a favorite strategy, validated by marketing research, assumes that Americans are most likely to buy the cigarettes, beer, and automobiles they can associate with a rustic setting.

No single motive can account for these disparate phenomena. Yet each does express something of the yearning for a simpler, more harmonious style of life, an existence "closer to nature," that is the psychic root of all pastoralism— genuine and spurious. That such desires are not peculiar to Americans goes without saying; but our experience as a nation unquestionably has invested them with peculiar intensity. The soft veil of nostalgia that hangs over our urbanized landscape is largely a vestige of the once dominant image of an undefiled, green republic, a quiet land of forests, villages, and farms dedicated to the pursuit of happiness.

17. From this passage we can infer that the author defines pastoralism as:
    (a) A collective longing and idealization of natural and rural lifestyles
    (b) A return to agriculture life from the busy city, giving up urban aspirations
    (c) A political platform to urge more sustainable living and vegetarianism
    (d) A genetic predisposition towards natural living

18. Which of the following best describes the relationship between pastoralism and American culture
    (a) Pastoralism is used exclusively as a tool of commercialization, to convince Americans to buy products
    (b) Elements of pastoralism are found in a range of American media, from poetry, to literature, to advertising, to television content
    (c) Most American culture is produced in pastoral settings for urban audiences
    (d) Pastoralism is an elitist concept which is only held by a small group of urban elite Americans

19. Based on this passage, why would advertisers use pastoral content in their copywriting?
    (a) Because all Americans have family in rural areas and hence connect to such content
    (b) Because there is an assumption that such content connects with some of the cultural longings of urban Americans across a range of demographic backgrounds
    (c) Because pastoral content makes Americans feel bad about their wasteful urban lifestyles
    (d) Because all Americans like westerns and cowboy movies, and hence will be influenced by such advertisements

20. According to this passage, what are some ways where the political system in America favours the pastoral?
    (a) It gives disproportionate representation to sparsely populated rural areas
    (b) It gives subsidies to farmers
    (c) It gives preference to local rather than national forms of education
    (d) All of the above

21. In this passage the author draws a contrast between
    (a) Urban Americans and their pastoral collective imagination
    (b) Capitalistic corporations and pastoral farmers
    (c) Deceitful media and the authentic leisure habits of Americans
    (d) Pastoral America and foreign agrarian practices

Extracted from Cory Doctorow and Rebecca Giblin (2022). Chokepoint Capitalism: How Big Tech and Big Content Captured Creative Labor Markets and How We'll Win Them Back. Beacon Press, 2022., , pp: 1-2

Culture has been captured. Three massive conglomerates own the three record labels and three music publishers that control most of the world's music. They designed the streaming industry, dominated by Spotify, which itself is (or was) partly owned by those same three labels. When Disney swallowed 21st Century Fox, a single company assumed control of 35 percent of the US box office. Google and Facebook have a lock on the digital ads that are wrapped around music, videos, and news online. Google, along with Apple, is the gatekeeper of everything mobile, giving it a massive cut on games, books, music, and movies. Via YouTube, it controls video streaming. Live Nation has sewn up ticketing and concerts. In the US, one company dominates terrestrial radio, and another satellite. Amazon has an iron grip on book, ebook, and audiobook sales, and dominates ebook and audiobook production. The only publisher that might be able to hold its own is Penguin Random House, and then only by gulping down as many other big publishers as it possibly can. The Big Six trade book publishers had become the Big Five by the time we started writing this book, and are making moves to become the Big Four by the time it's published.

Between them, these corporations are generating enormous wealth. Some of the creators they distribute are too, but headlines about Jay-Z's billion-dollar fortune or the juicy advance paid to the debut author of a hot new thriller disguise the reality: precious little of the vast wealth generated by art and culture is shared with the people who actually make it.

Culture markets are winner-takes-all: a handful of people take almost all the rewards. This has long been the case, but now there's less and less to share between everyone else. For book authors, advances have been cut by more than half since the Great Financial Crisis of 2007–8. News publishers once got almost all the money from ads on their content, but that's fallen to as little as thirty cents on the dollar. Songwriters report royalty statements have become "four times as thick for a quarter of the money." Fiona Bevan, who cowrote the hit track "Unstoppable" with Kylie Minogue, reported receiving just a hundred pounds in streaming royalties, despite its featuring on an album that topped the British charts. Rebecca Gates, who surveyed musicians for the Future of Music Coalition, says even well-known artists are struggling. "I've seen hard data for people who are in successful bands, quote unquote, festival headlining bands, who would make more money in a good retail job." Guitarist and producer Melvin Gibbs, who has been featured on almost two hundred albums, knows the system isn't working. "One of the principles of having a healthy ecosystem is that every level of the ecosystem has to be operating at maximum efficiency. The plankton have to be healthy for the blue whales to survive." But the music business (and arts industries more broadly), are "based on starving the plankton so that the whales can survive."

The reason creative workers are receiving a declining share of the wealth generated by their work is the same reason all workers are receiving a smaller share—we have structured society to make rich people richer at everyone else's expense. The playing field has been tilted so far that a growing number of people are falling off the edge, beset by precarious employment, stagnating wages, high costs for education, housing and healthcare, and economic policies that prize shareholders over people and communities.

22. This passage argues that
    (a) Most creative workers lives have become more precarious over the last decade
    (b) Corporations deserve more market share than they have currently
    (c) Digital platforms have democratised the discovery of new artists
    (d) Creative artists are compensated more meritocratically now than they were a decade ago

23. The authors of this passage believe that
    (a) Large corporations should give shares in their companies to artists
    (b) The revenues from creative work should be more equally distributed among workers
    (c) The top creators who earn huge amounts should share their proceeds among their community
    (d) Creative industries are saturated with unproductive workers who should leave the industry

24. A few large corporations control many of the platforms that we use to access content (eg. Spotify, YouTube, app stores etc.). This a problem because
    (a) These large corporations create winner-take-all ecosystems which benefits them disproportionately
    (b) These platforms are inherently nationalist and discriminate against people from other countries
    (c) These platforms are able to brainwash consumers into consuming content they provide
    (d) Creative workers are unable to post their content on these platforms easily

25. The authors use the potential transition from the Big Six to the Big Four as
    (a) A legitimate, necessary challenge to the dominance of Amazon
    (b) A reason to advocate for broader shareholding of publishing corporations
    (c) An illustrative example of how quickly consolidation is happening in creative industries
    (d) An example of what an efficient market economy does when there are too many companies in a space

26. According to the authors, the success of a small number of big-name artists is often used by corporations
    (a) To sell the story that platforms are actually helping artists rather than hurting them
    (b) To distract people from the reality of how the wealth generated is spread unevenly
    (c) To market to consumers of the indispensability of their platforms
    (d) A & B

Extracted from Gemma Conroy (2023), What the Science says about California's record-setting snow, Nature. News Explainer.

California's recent parade of storms is driven by atmospheric rivers — long, narrow plumes of moist air that travel from the tropics to higher latitudes. When these 'rivers in the sky' sweep over mountainous regions they condense into clouds that produce heavy rain and snow, says Allison Michaelis, an atmospheric scientist at Northern Illinois University in DeKalb.

An atmospheric river can ferry enormous amounts of water vapour; some discharge more than twice as much water as the Amazon River. In the western United States, atmospheric rivers contribute up to half of the region's annual rain and snow. Since last November, 31 atmospheric rivers have hit California, more than half of which ranged from moderate to extreme, according to data from the Scripps Institution of Oceanography in La Jolla, California. Although back-to-back atmospheric rivers are not unheard of, they make a significant impact, says Michaelis. "What might have typically been a more beneficial event could turn potentially hazardous if it comes on the heels of another system."

In the Sierra Nevada mountain range in eastern California, the season is the snowiest since 1952, says Andrew Schwartz, an atmospheric scientist who leads the University of California, Berkeley's Central Sierra Snow Lab in Donner Pass. "It's just dumping snow," he says. A total of 18 metres of snow has fallen at the lab this season, nearly double the yearly average. And statewide, the snow's water content — the amount of water that would result if the snow were melted — is roughly double the average, says Schwartz.

The conditions have brought welcome relief after the three driest years on record in California, allowing the rollback of 'exceptional' and 'extreme' drought designations for the first time since 2020, according to the US National Oceanic and Atmospheric Administration's US spring outlook. But capturing and storing water released as the thick snowpack begins to melt can be a race against time, says Tom Corringham, a research economist at Scripps. If the snow melts too quickly, the excess water ends up in the ocean instead of being stored and distributed to where it's needed most, he says. "That's not ideal for water management."

As the atmosphere warms, atmospheric rivers are likely to become more frequent and hold more moisture, and that will result in heavy downpours of rain and snow, says Schwartz. He notes that California is swinging between wet and dry periods that are more extreme than in the past. "While this variability has always existed, it's becoming amplified due to climate change," he says.

Kim Reid, a climate scientist at Monash University in Melbourne, Australia, says that more work needs to be done to understand how climate change will affect jet streams and other systems that influence the direction of atmospheric rivers. If atmospheric rivers shift by a few degrees latitude, they could become more common in some regions and rarer in others, she says.

27. The article explains how
    (a) Water vapor from rivers can cause floods
    (b) Atmospheric rivers can create water management issues
    (c) Jet streams and atmospherics rivers are related
    (d) Atmospheric rivers flow into the Amazon river

28. According to the article California
    (a) Was classified as experiencing drought conditions for the last 3 years
    (b) Has had too much water in recent years
    (c) Has had too much snow in recent years
    (d) Usually receives about 18 meters of snow per year

29. According to Kim Reid
    (a) Research shows that atmospheric rivers are predictable to a high degree
    (b) Atmospheric rivers flow from the United States towards South America
    (c) Atmospheric rivers flow from South America towards the United States
    (d) Research is needed on factors affecting atmospheric rivers

30. According to the article, atmospheric rivers
    (a) Can be studied only from jet aircraft
    (b) Can be beneficial
    (c) Can be controlled
    (d) Can be redirected

Section 2: Quantitative Reasoning

31. If $\left(\frac{2^{-n}}{3}\right)\left(\frac{3^{-n}}{2}\right) = 36$, then what is the value of n?
    a. 2
    b. -3
    c. 6
    d. 4

32. In how many ways can 3 identical green shirts and three identical red shirts be distributed among 6 children such that each get one shirt?
    a. 20
    b. 40
    c. 216
    d. 720

33. Based on the table below, which of the following is true?

Quantity A	Quantity B
Maximum value of $\left(\frac{1}{4+y^2}\right)$	$\frac{1}{4}$

    a. Quantity A is greater
    b. Quantity B is greater
    c. Quantity A equals Quantity B
    d. The relationship cannot be determined from the given information.

34. What is the least positive integer that will satisfy $x^2 + 17x - 84 > 0$?
    a. 1
    b. 21
    c. 4
    d. 5

35. There are 5 doors to a lecture room. In how many ways can a student enter the room through a door and leave the room through another door?
    a. 10
    b. 9
    c. 20
    d. 1024

36. If I have an urn with 5 black balls and 11 red balls, what is the probability of picking two red balls?
    a. 11/24
    b. 2/11
    c. 1/8
    d. 11/16

37. Which of the following is equal to 1/5 of 0.02%?
    a. 0.04
    b. 0.004
    c. 0.0004
    d. 0.00004

38. Alia wanted to invest in a rooftop rainwater harvesting system. The dimensions of the roof are: 10m by 15m. She lives in the dryland regions of Maharashtra where this year there has been 500mm rainfall. Assuming that she can only harvest about 60% of the water that falls on her roof, how much rain water did she harvest this year?
    a. 75 liters
    b. 750 liters
    c. 4,500 liters
    d. 45,000 liters

39. Six bells commence tolling together and toll at intervals of 2,4,6,8,10 and 12 seconds respectively. In 30 minutes how many times do they toll together?
    (a) 10
    (b) 12
    (c) 15
    (d) 16

40. What is the least number by which 825 must be multiplied in order to produce a multiple of 715?
    (a) 11
    (b) 13
    (c) 5
    (d) 26

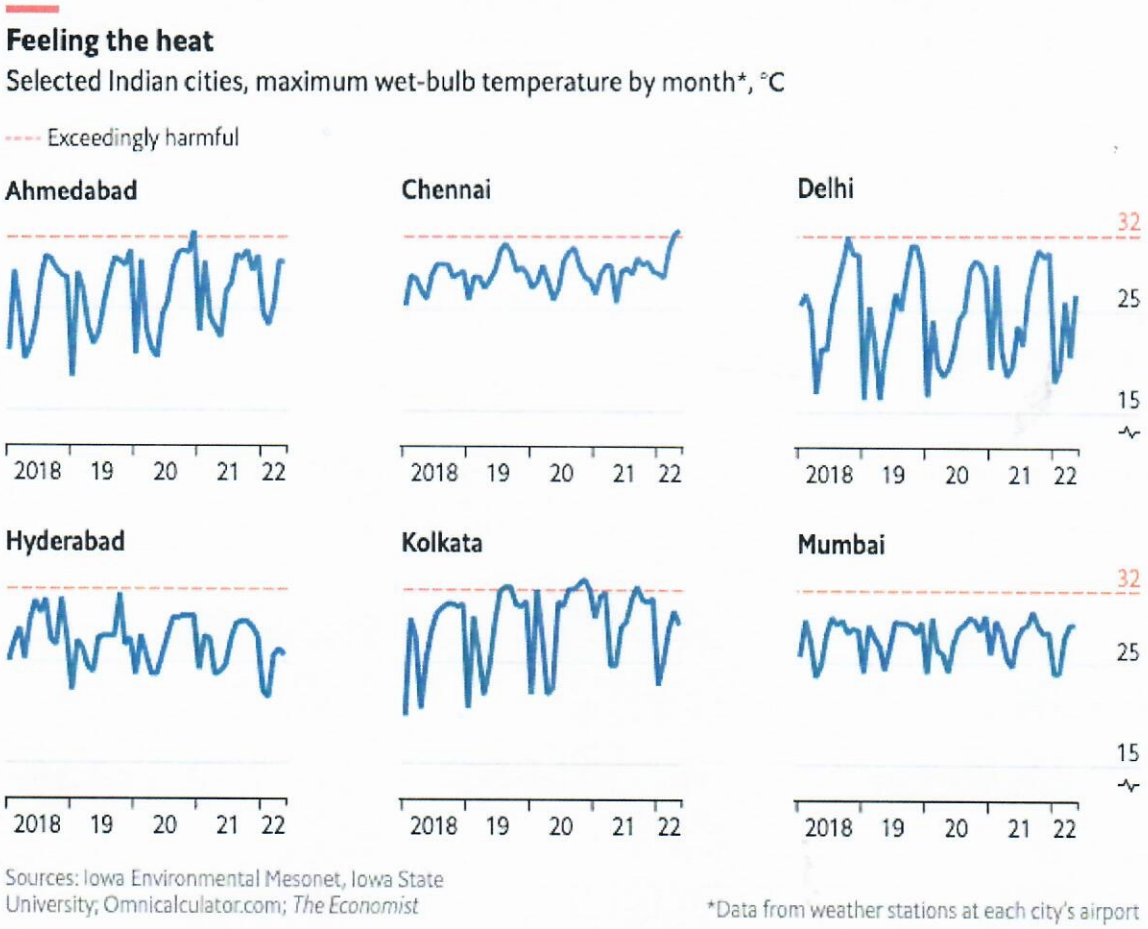


Figure 1
Source: Heat and humidity are putting millions of Indians in peril. (2022, March 13). The Economist.

The Wet Bulb temperature is the temperature indicated by a moistened thermometer bulb exposed to the air flow. A wet-bulb temperature of 35 C is regarded as the theoretical limit of what humans can endure and prolonged exposure to 32 C can make outdoor activity debilitating.

Based on the Figure 1 above on wet bulb temperatures across selected Indian cities, please answer the questions 41 and 42 that follow.

41. Across the cities covered in these plots, how many times has the limit of 32 C been breached in the last 5 years?
    (a) Never
    (b) At most 1 time
    (c) At most 3 times
    (d) At least 5 times

42. Which of the following statements is TRUE?
    (a) There is an increasing trend in wet bulb temperatures in all cities displayed
    (b) The variance in wet bulb temperature for Mumbai is lower than that of Ahmedabad
    (c) The average wet bulb temperatures in Chennai and Hyderabad are higher than that of Delhi
    (d) Option (b) and (c)

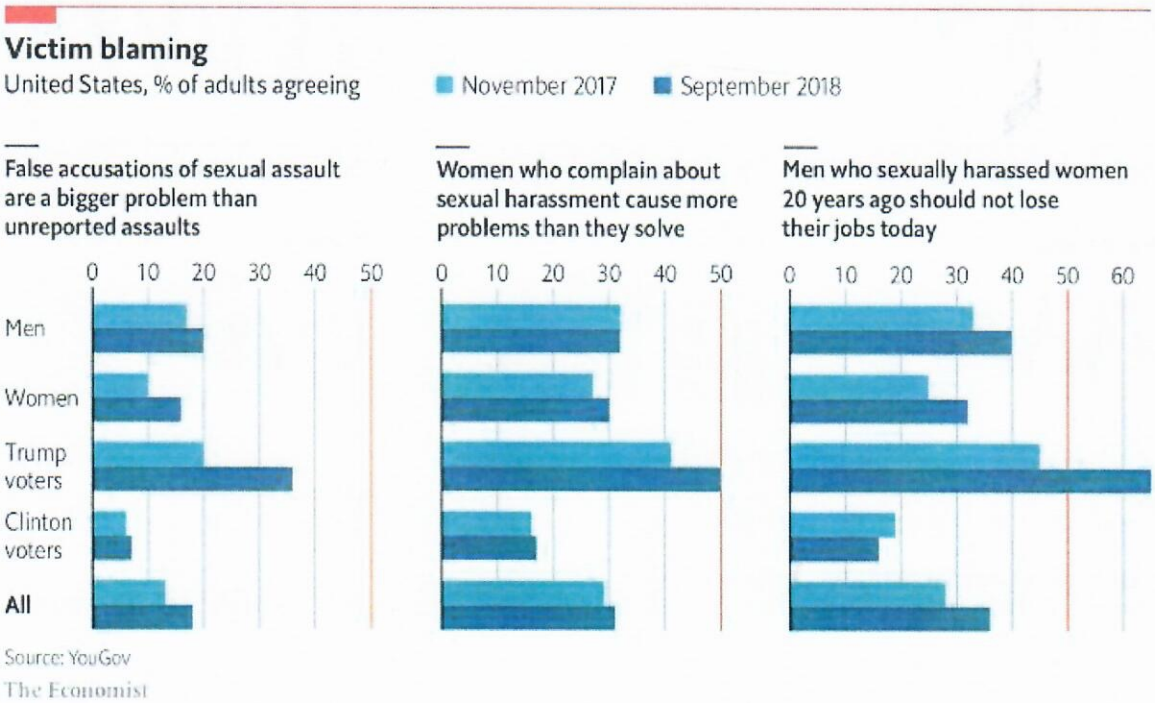


Figure 2

Source: After a year of #MeToo, American opinion has shifted against victims. (2018, Oct 15). The Economist.

The hashtag #MeToo went viral in Oct 2017 encouraging women to speak out about their experiences of sexual harassment in public. In the first week of November 2017, YouGov polled 1,500 Americans about their attitudes on sexual harassment. In the final week of September 2018, it conducted a similar poll again. The plot in Figure 2 presents some findings from these surveys. Please answer questions 43 to 45 based on the figure.

43. The results indicate that a year after #MeToo started,
    (a) Overall support for sexual harassment victims stayed about the same compared to the preceding year.
    (b) Overall support for sexual harassment victims reduced compared to the preceding year.
    (c) Overall support for sexual harassment victims increased compared to the preceding year.
    (d) Overall support for sexual harassment victims stayed about the same compared to the preceding year EXCEPT among Trump voters

44. Consider the third column which captures support for the statement "Men who sexually harassed women 20 years ago should not lose their jobs today".
    (a) The trend in support differs across genders but not across political affiliation
    (b) The trend in support differs across political affiliation but not across genders
    (c) The trend in support differs across both genders and political affiliations
    (d) The trend in support is similar across both genders and political affiliations

45. Consider the first column which captures support for the statement "False accusations of sexual assault are a bigger problem than unreported assaults". Which of the following statements in TRUE:
    (a) Women's support for this statement increased by about 50% between 2017 and 2018.
    (b) A majority of Trump voters supports this statement in 2018
    (c) Both (a) and (b)
    (d) Neither (a) nor (b)

	(1) Full sample n = 1,266,332	(2) Those who can subtract n = 431,981	(3) Those who cannot subtract n = 834,351
Can subtract (%)	33	–	–
Female (%)	46	45	47
Most privileged (%)	20	27	17
Least privileged (%)	11	8	13
Mother attended school (%)	48	58	44
Father attended school (%)	65	71	63
Overage (%)	7	9	7
Attend private school (%)	25	31	22
Receives private tuition (%)	26	37	21

Note: we define the most privileged children as those living in a mud and cement house possessing electricity, a phone and a television. We define the least privileged children as those living in a mud house with none of the aforementioned possessions.

Table 1

Source: Alcott, B., & Rose, P. (2017). Learning in India's primary schools: How do disparities widen across the grades?. International Journal of Educational Development, 56, 42-51.

The Annual Status of Education Reports (ASER) conducted by Pratham in every rural district in India, collects information on enrolment, literacy levels, and numeracy levels among 5–16 year-olds. Table 1 above presents the distribution of children who are able to perform a subtraction task. Children attempt two subtractions and must complete each successfully to be considered able to subtract. Please answer questions 46 and 47 based on the table.

46. What is the approximate number of children in the sample who cannot subtract and who received private tuition?
    (a) 17,500
    (b) 66,700
    (c) 1,75,000
    (d) 6,67,000

47. Of those who can subtract, which of the following is true:
    (a) a majority received private tuition
    (b) a majority had mothers who also attended school
    (c) Both (a) and (b)
    (d) Neither (a) nor (b)

Table 2

Size and growth rates of migrant populations by migration stream, India, 1971-2001

Migration stream	Size 2001 (millions)	Percentage distribution	Growth rate (percentage)		
			1971-1981	1981-1991	1991-2001
Intrastate					
Rural-to-rural	161.0	68.6	19.8	10.7	16.8
Rural-to-urban	36.3	15.3	45.1	20.1	16.4
Urban-to-rural	11.0	4.7	32.9	10.1	-4.3
Urban-to-urban	25.8	11.0	57.9	5.2	43.1
Interstate					
Rural-to-rural	11.0	28.2	13.8	9.1	46.6
Rural-to-urban	15.3	39.3	42.5	16.6	76.4
Urban-to-rural	1.9	4.9	15.9	11.4	1.5
Urban-to-urban	10.7	27.4	28.4	15.5	28.0

Sources: Census of India 1971, series 1, part II, D(i), migration tables; Census of India 1981, series 1, part V, A and B(i), migration tables (tables D1 and D2); Census of India 1991, series 1, part V, D series, migration tables, vol. 2, part 1, (table D2); Census of India 2001, table D-2, compact disk. All censuses published in New Delhi by India, Ministry of Home Affairs, Registrar General and Census Commissioner.

Note: Migrants unclassifiable by rural-urban status were excluded.

Source: Bhagat, R. B. (2010). Internal migration in India: are the underprivileged migrating more. Asia-Pacific Population Journal, 25(1), 27-45.

Table 2 above uses Census of India data from 1971 to 2001 to categorize different types of migrants.

48. What proportion of migrants moved TO rural areas in 2001?
    (a) 68.6%
    (b) 73.3%
    (c) 33.1%
    (d) 67.7%

49. What does the number "-4.3" in the last column, 3rd row of the table imply?
    (a) That migration from urban to rural areas decreased by 4.3 million individuals between 1991 and 2001
    (b) That intrastate migration from urban to rural areas decreased by 4.3 percent between 1991 and 2001
    (c) The migration from urban to rural areas decreased by 4.3 percent in the period between 1981-91 and 1991-2001
    (d) None of the above

50. Based on the table which of the following is TRUE?
    (a) The majority of migration in 2001 consisted of individuals moving between villages (rural to rural)
    (b) The majority of migration in 2001 consisted of individuals moving to cities from villages
    (c) Both (a) and (b)
    (d) Neither (a) nor (b)

Section 3: Map-based Reasoning

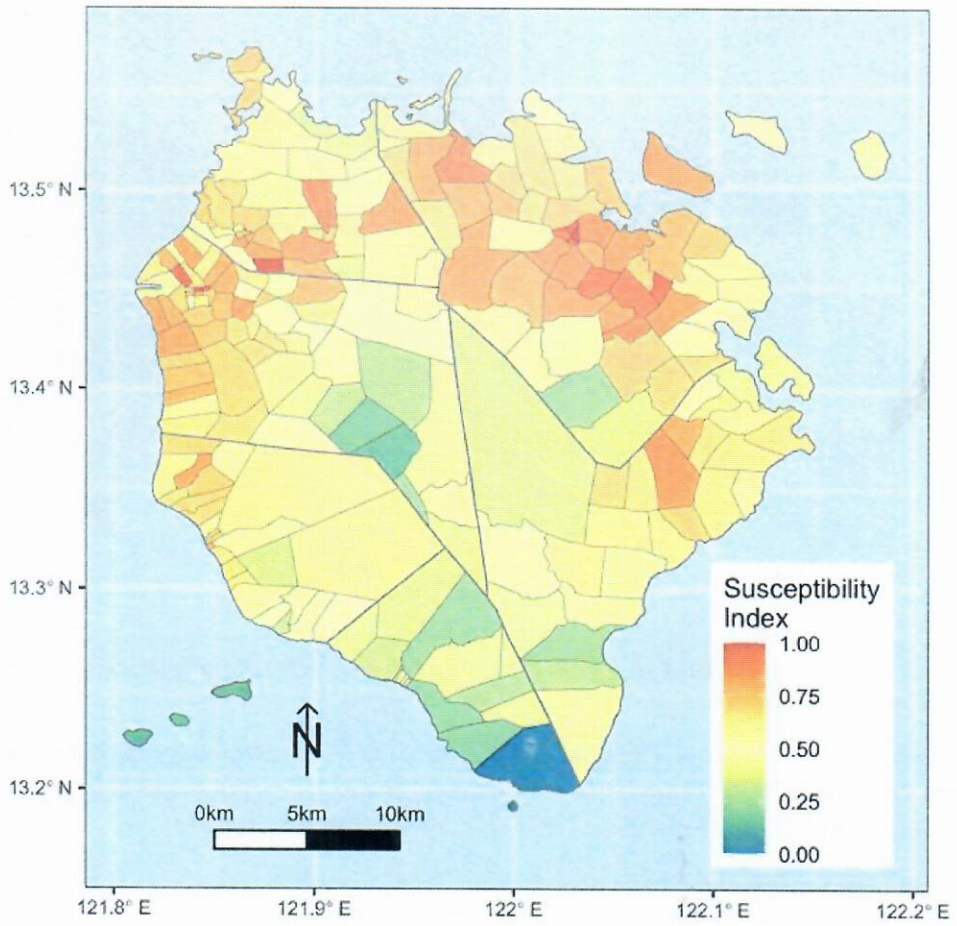


Figure 3

Source: Salvacion, A. R. (2022). COVID-19 susceptibility mapping: a case study for Marinduque Island, Philippines. *Spatial Information Research*, *30*(5), 563-570.)

The map in Figure 3 outlines the COVID Susceptibility Index of Marinduque Island, Philippines, where '1' denotes the highest probability of infection spreading, while '0' denotes the least.

51. Which among the following is the likely area of the island?
    (a) 900 sq. km
    (b) 400 sq. km
    (c) 300 sq. km
    (d) 200 sq. km

52. If the current time in India (IST) is 23:00 on 1st March, 2023 what would be the approximate local time on this island? (Note: each degree longitude corresponds to 4 minutes.)
    (a) 20:00 on 1st March
    (b) 01:30 on 2nd March
    (c) 02:30 on 28th February
    (d) 03:30 on 2nd March

53. Based on the map, which of the following conclusion can be drawn?
    (a) The population density is relatively high on the northeastern part of the island.
    (b) People living at the island's centre have better access to medical facilities.
    (c) Both (a) and (b)
    (d) None of the above

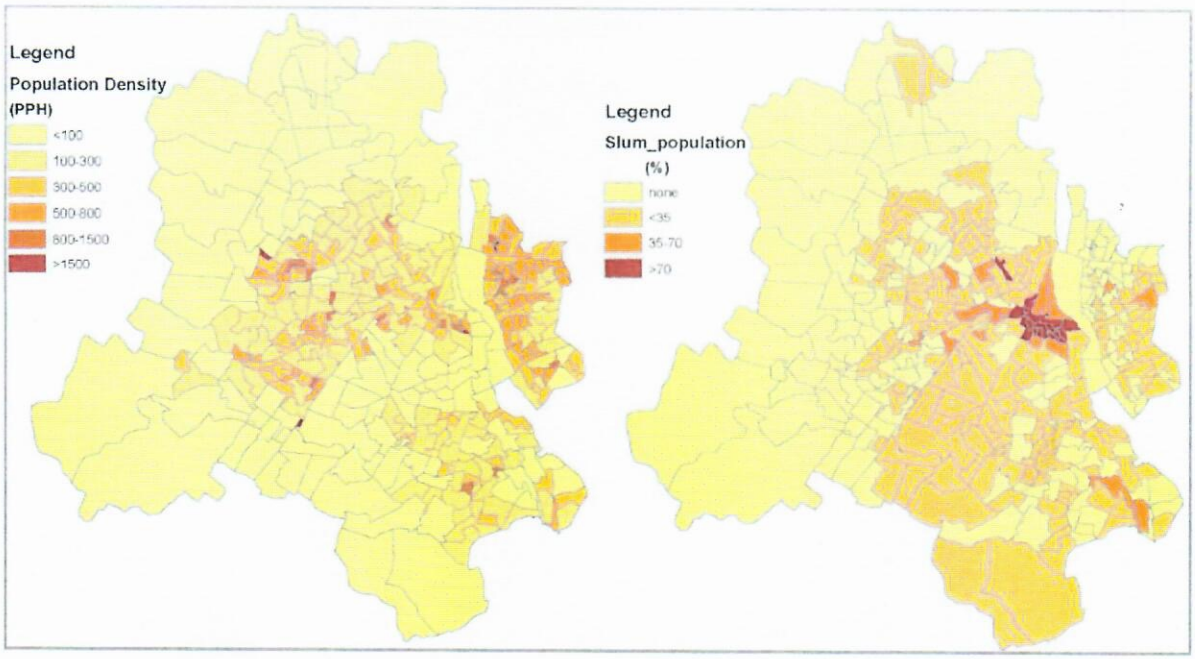


Figure 4

Source: Sharma, A., Tiwari, G., & Rao, K. R. (2020). Identifying mixed use indicators for including informal settlements as a distinct land use: Case study of Delhi. *Transportation Research Procedia*, *48*, 1918-1930.

Figure 4 above shows two maps. The map on the left shows 'population density' in all wards of Delhi in "Persons per Hectare" (PPH), and the map on the right shows slum population as a percentage of ward population. Answer the following questions based on these two maps.

54. Which one of the following can you infer from these maps?
    (a) Low population density in a ward implies absence of slums
    (b) High population density implies a high slum population
    (c) Slums can exist in low density wards
    (d) Slums have low densities

55. Which one of the following can be calculated based on the data available in these two maps?
    (a) Number of slums in Delhi
    (b) Density of each ward
    (c) Population of each ward
    (d) Number of wards with a high slum population, where 'high' is defined as 'slum population higher than 70% of ward population'

56. Some wards have high population density but a low share of slum population. What is the most likely reason for this?
    (a) Prevalence of high-density building forms that are not slums
    (b) The two maps must be based on data from different decades
    (c) Many people own two homes
    (d) The slum population was not counted

57. The wards with the highest share of slums populations are located quite close to each other. What is the most likely reason for this (given the information available)?
    (a) People who live in slums want to live close to each other
    (b) Policies have been made to relocate other slums to that area
    (c) Major manufacturing industries are located in that area
    (d) None of the above

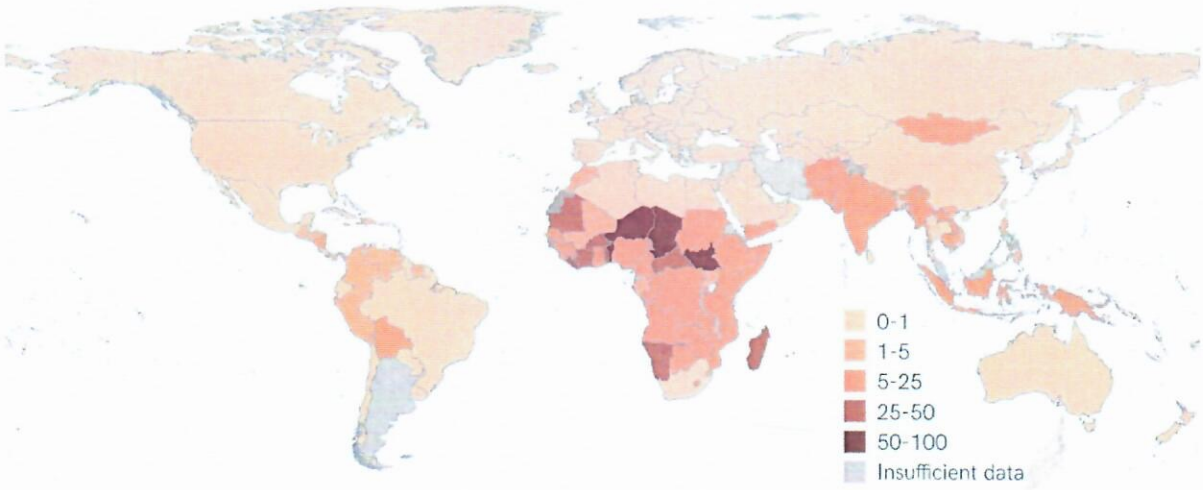


Figure 5

Population (%) that practised open defecation in 2020 [adapted from World Health Organization (2021) Progress on household drinking water, sanitation and hygiene 2000-2020: five years into the SDGs].

Based on the map shown in Figure 5, answer the questions that follow.

58. Given that the population of India in 2020 was 138 crores, at least how many people in India defecated in open during 2020?
    (a) 13.8 million
    (b) 69 million
    (c) 138 million
    (d) 345 million

59. Statement 1: Africa had the highest number of people as compared to other continents, who practised open defecation in 2020.
    Statement 2: North America had the least number of people as compared to any other continent, who practised open defecation in 2020
    Evaluate the above statements with respect to information provided in the map and find out which of the following is the most reliable conclusion?
    (a) Only Statement 1 follows.
    (b) Only Statement 2 follows.
    (c) Both the statements follow.
    (d) Cannot be inferred due to lack of data.

60. Statement 1: About or more than half of the world (by area) has less than 1% of population who practised open defecation.
    Statement 2: The global north is open defecation free.
    Make a visual comparison and evaluate the above statements and find out which of the following is the most reliable conclusion?
    (a) Only statement 1 follows
    (b) Only statement 2 follows.
    (c) Both statements 1 and 2 follow.
    (d) Neither statement 1 nor statement 2 follows.

Section 4: Logical/Analytical Reasoning

In a school function ceremony, seven students, Anshu, Biswajit, Charu, Dinesh, Elisa, Farooq, and Ganesh have to deliver their performances in seven consecutive slots, not necessarily in the order of their given names. The following information is known about the order in which the students perform:

Charu performs immediately before Dinesh

Ganesh performs sometime after Charu

There are exactly two performances made between the performances of Anshu and Elisa.

61. In which of the following slots can Ganesh not perform?
    (a) Second
    (b) Third
    (c) Fourth
    (d) Fifth

62. If Biswajit and Farooq dislike one another and want to perform as far away from each other as possible, who could be the first two performers respectively?
    I. Anshu and Biswajit
    II. Farooq and Anshu
    III. Biswajit and Anshu
    (a) Only II
    (b) Only III
    (c) Both I and II
    (d) Both II and III

63. What is the latest slot in which Charu could perform?
    (a) Third
    (b) Fourth
    (c) Fifth
    (d) Sixth

64. If it is known that Biswajit performs before Farooq, for which of the following positions of Anshu can the exact order of all the performers be determined?
    (a) Second
    (b) Fourth
    (c) Fifth
    (d) None of the seven positions

65. What is the maximum number of performers between Farooq and Ganesh?
    (a) Two
    (b) Three
    (c) Four
    (d) Five

66. If Anshu was the second to perform, who was the third performer in the ceremony?
    (a) Biswajit
    (b) Charu
    (c) Dinesh
    (d) Ganesh

67. Palmistry—the art of understanding an individual's present personality and predicting his or her future state through the study of the shape, size, and lines of the hands—is an unscientific technique. In a study, most palmists' assertions about the present financial status of the individuals in the sample population were found to be mere intelligent guesses.

Which one of the following is an assumption necessary to the argument?

(a) Individuals with the same financial status usually do not have a similar personality.
(b) There is a stable correlation between an individual's personality and his or her present financial status.
(c) Palmistry is an effective means of predicting how personalities of individuals evolve over the long term.
(d) There are numerous other methods for understanding the personality of an individual that are more precise than palmistry.

68. Each year, the number of students caught copying in examination is nearly the same as the number of students caught driving without a valid driving license and the number of students caught traveling without a valid ticket. Therefore, the outcry about copying in examination ought to be put to rest, as the act of copying in examination is in fact almost as mundane as the acts of driving without a valid driving license or traveling without a valid ticket.

Which one of the following, if true, would most effectively undermine the author's argument?

(a) The total number of incidences of students traveling without a valid ticket is many times greater than students being caught driving without a license.
(b) The punishments upon being caught copying in examination are graver than those upon being caught driving without a valid driving license or traveling without a valid ticket.
(c) Fewer students would take their chances with driving without a valid driving license and traveling without a valid ticket than with copying in examination.
(d) The prevalence of wrongdoings such as copying in examination, driving without a valid driving license or traveling without a valid ticket among students is inversely proportional to their probability of getting caught.

69. The print circulation of The World Tribune has shown a 40 percent decline in the past two years. However, the traffic on the newspaper's website has increased by 30 percent during the same period. The website contains many news sections and blogs that are not featured in the print newspaper but are the most read pages of the website. Therefore, to maintain its profits, the newspaper has decided to discontinue its still-profitable print edition and to introduce more content on the website that is similar to the exclusive content on the most read pages of the website.

Which one of the following is an assumption on which the decision of The World Tribune depends?

(a) To access the content on the newspaper's website, the readers of the website will be willing to pay a monthly subscription fees that is equal to the revenue that the print edition of the newspaper earned per reader each month.
(b) The print circulation of the newspaper declined in the past two years because the newspaper's website offered more interesting content.
(c) The revenue earned from increased website traffic will not be less than the revenue lost by discontinuing the print edition.
(d) Introducing more content similar to the exclusive content on the most read pages of the website will increase the newspaper's website traffic further.

70. *Astragalus linifolius (A. linifolius)*, a rare plant species that is found only in the Colorado region of the United States, reproduces when a pollinating agent like a fly or a bee carries the pollen grain from the male part of one plant to the female part of another plant of the same species. To maintain the population of this species, the use of pesticides that control grasshoppers should be banned in this region. These pesticides also often result in significant mortality among the *Bombylius* flies that are the most important pollinating agents of *A. linifolius*.
Which one of the following, if true, most strengthens the argument?
(a) A. linifolius is also pollinated, though to a much-lesser degree, by some local species of bees.
(b) The pesticides that control insect herbivores other than grasshoppers are even more toxic to Bombylius flies.
(c) Bombylius flies do not reproduce very fast and their populations do not recover for many years after one spraying of a pesticide that controls grasshoppers.
(d) The populations of some other plant species in the Colorado region have decreased to an even greater extent than the population of A. linifolius since the spraying of pesticides that control grasshoppers first started in the region.

71. Most experts agree that strict adherence to the hurricane preparedness protocol by states that are prone to hurricanes reduces the death toll from hurricanes. However, in the state of Scalex, the death toll from a hurricane that came in 2010, when the state did not adhere to this protocol, was only 25, while the death toll from a hurricane that came in 2018, when the state strictly adhered to this protocol, was 53.

Which one of the following, if true, most helps to reconcile the experts' belief with the apparently contradictory evidence described above?

(a) The death toll in the state of Scalex from a hurricane in the year 2012, when the state had partially adhered to the hurricane preparedness protocol, was 40
(b) The death toll from hurricanes is directly proportional to the intensity of the hurricanes, and the intensity of the hurricane that came in the state of Scalex in 2018 was five times that of the hurricane that came in the state in 2010.
(c) Implementation of the hurricane preparedness protocol ensures the rapid evacuation of people from areas that are likely to be affected by the hurricane.
(d) Psychological studies show that the adoption of the hurricane preparedness protocol by a state lulls many residents into a false sense of security, due to which they do not strictly adhere to the individual safety measures prescribed by the protocol.

72. "All [research] methods have their own specific strengths and limitations. Any analysis is as good as the data or its assumptions. In limiting oneself to one method there is a danger of coming up with partial truths, and make unjustified generalisations. As this paper has shown, innovation is something multifarious, and policy impacts depend on the design of the policies and context in which they are used. Research should be more concerned to the generation of robust knowledge than it presently is." *Kemp, R. and Pontoglio, S., 2011. The innovation effects of environmental policy instruments—A typical case of the blind men and the elephant?. Ecological economics, 72, pp.28-36.*

Which of the following statements is the most important implication of the paragraph above?
(a) One should use good data and assumptions in research.
(b) One should not limit oneself to one research method.
(c) It is not possible to make generalizations about policy impacts.
(d) Presently, research is not concerned with the generation of robust knowledge.

73. "The principal reason why it has been so difficult to make cumulative significant advances in educational practice, I would argue, is that it has proved very difficult to discover or develop a body of educational practice that can be controlled tightly, and replicated easily, that at the same time is effective in the variety of contexts where education must proceed. Practices that are effective seem to depend on the backgrounds, knowledge, and motivations of the student body, and also on the skills and personality of the teacher. The physical equipment used in education, like textbooks, film, and recently computers and computer programs, build in some transferable elements to a teaching routine. However, to date no artifact has been developed for educational purposes that has the power of an antibiotic for dealing with infection." *Nelson, R.R., 2011. The Moon and the Ghetto revisited. Science and Public Policy, 38(9), pp.681-690.*

Which of the following statements can NOT be said based on the paragraph above?
(a) It is difficult to improve educational practice.
(b) Effectiveness of various educational practices is context-specific.
(c) Physical equipment used in education (like textbooks, film, and computer programs) are not helpful in improving educational practice.
(d) Antibiotics are very effective at dealing with infection.

74. It is well known that the world urgently needs adequate distribution of food, so that everyone gets enough. Adequate distribution of medicine is just as urgent. Medical expertise and medical supplies need to be redistributed throughout the world so that people in emerging nations will have proper medical care.

This paragraph best supports the statement that:
(a) the majority of the people in the world have never been seen by a doctor.
(b) food production in emerging nations has slowed during the past several years.
(c) the medical-supply industry should step up production of its products.
(d) many people who live in emerging nations are not receiving proper medical care.

75. Yoga has become a very popular type of exercise, but it may not be for everyone. Before you sign yourself up for a yoga class, you need to examine what it is you want from your fitness routine. If you're looking for a high-energy, fast-paced aerobic workout, a yoga class might not be your best choice.

This paragraph best supports the statement that
(a) yoga is more popular than high-impact aerobics.
(b) before starting a new exercise regimen, you should think about your needs and desires.
(c) yoga is changing the world of fitness in major ways
(d) yoga benefits your body and mind

76. "Stories, or narratives, when expertly incorporated, can help augment scientific knowledge. But the ubiquity of narratives, a general focus on the context of public reasoning on telling stories rather than listening to them, and the unruly power of a charismatic (persuasive or popular) narrative all mean that cognitive and collective functions of narratives are widely overlooked or dismissed as too difficult to include in the provision of expert evidence." *Craig, C. and Dillon, S., 2023. "Storylistening" in the science policy ecosystem. Science, 379(6628), pp.134-6*

This paragraph is trying to say that:
(a) "Storytelling" is not important for scientific evidence.
(b) It is often difficult to differentiate fact from fiction.
(c) Stories or narratives are often not included in the provision of expert evidence.
(d) Experts need to be more charismatic, persuasive or popular while communicating their ideas.

77. "A global survey reveals that attacks on humans by large carnivores have increased in low-income countries with a high proportion of agricultural land. The attacks decreased considerably in countries with a higher density of forest. Attacks largely depend on socioeconomic context – people in high-income countries are mainly at risk during recreational activities, whereas people in low-income countries are vulnerable while farming, fishing and collecting forest products." *India has the most attacks on humans by tigers, leopards and wolves. (2023). Nature India. https://doi.org/10.1038/D44151-023-00021-3*

Based on the information provided in the paragraph above, which of the following statements is true?

(a) The number of attacks on humans by large carnivores is higher in low-income countries than in high-income countries.
(b) Humans are more likely to be attacked by large carnivores on agricultural land than in forests.
(c) The risk of attack by large carnivores depends on the socio-economic context and type of activity.
(d) People in high-income countries are more likely to engage in recreational activities, while those in low-income countries are more likely to be farming, fishing and collecting forest products.

Read the below passage carefully and answer the questions:
"Giving children computers in grade school is a waste of money and teachers' time. These children are too young to learn how to use computers effectively and need to spend time on learning the basics, like arithmetic and reading. After all, a baby has to crawl before she can walk."

78. Which of the following, if true, would strengthen the speaker's argument?
    (a) studies showing computers are expensive
    (b) evidence that computer games help children's hand-eye coordination
    (c) examples of high school students who use computers improperly
    (d) evidence that using computers makes learning to read difficult

79. Which of the following, if true, would weaken the speaker's argument?
    (a) a demonstration that computers can be used to teach reading and arithmetic
    (b) analysis showing that new computers are more cost-effective than repairing old computers
    (c) examples of adults who do not know how to use computers
    (d) recent grade reports of students in the computer classes

80. Which of the following methods of argument is used in the previous passage?
    (a) a specific example that illustrates the speaker's point
    (b) relying on an analogy to prove the speaker's point
    (c) displaying statistics that back up the speaker's point
    (d) comparing different methods of learning

Based on the conditions below, answer the questions that follow.

An industrial electrician attaches exactly seven components—designated S, T, V, W, X, Y, and Z—to a circuit board in seven consecutive steps; exactly one component is attached per step. Each component is attached exactly once, and each is attached either by hand or by machine, but not both.

- X is the fourth component attached.
- Exactly two components are attached by hand at some time before X is attached.
- No component is attached by hand before T is attached.
- W is attached at some time before T.
- Y is attached at some time after both Z and S.
- The sixth component attached is attached by hand.

81. Which one of the following could be an accurate list, in order, of the first three components attached?
    (a) W, T, S
    (b) X, Y, Z
    (c) Y, W, T
    (d) Y, Z, S

82. Which one of the following components must be attached by machine?
    (a) S
    (b) W
    (c) Y
    (d) Z

83. If V is the seventh component attached, each of the following components could be attached by machine EXCEPT:
    (a) S
    (b) V
    (c) X
    (d) Y

84. Which one of the following is a complete and accurate list of the components, any one of which could be the sixth component attached?
    (a) S, W, Z
    (b) S, T, Y, Z
    (c) S, V, Y, Z
    (d) S, W, Y, Z

85. Which one of the following components must be attached by hand?
    (a) T
    (b) V
    (c) X
    (d) Z

86. If S is attached by machine, which one of the following must be true?
    (a) Z is attached by hand.
    (b) X is attached by hand.
    (c) V is attached by hand.
    (d) Y is the seventh component attached

87. A test that examines people on their memory capacity for spatial layouts has placed Jason in the top 1 percentile of all test-takers. We can conclude from this that his memory capacity for things that do not involve spatial layouts will be below average.

The conclusion follows logically if which one of the following is assumed?

(a) Jason tried hard to remember spatial layouts.
(b) Jason has a greater proclivity to remember spatial layouts than most people.
(c) It is possible for Jason to improve, through practice and effort, his memory capacity for things that do not involve spatial layouts.
(d) The total memory capacity of the human brain is fixed and equal for all people.

88. Policy narratives are social constructions of reality that give storytellers a means to express their values, influence the priorities of government, and shape policymaking. In a democratic system shaped by the interests of the citizenry, how policy narratives positively or negatively depict individuals or groups helps explain why policy designs might benefit one group or punish another (Schneider et al., 2014). These perceptions manifest in the policy narratives used by policy actors within a policy subsystem and play a key role in shaping public opinion (Shanahan et al., 2011). ...(In the case of narratives regarding air pollution in Delhi) there is an overall tendency towards hero-centric narratives and some distinct proliferation of specific groups as the receivers of actions.

Costie, D., & Olofsson, K. (2022). Narrators and Narratives: A Study of Climate and Air Issues in Delhi, India. International Review of Public Policy, 4(2), 171–190.

Which of the following statement can NOT be said based on the information in the paragraph above:

(a) Policy narratives play a role because they could shape policy making.
(b) Policy narratives do not matter in undemocratic systems
(c) Policy narratives can positively or negatively depict different individuals
(d) Regarding air pollution in Delhi, hero-centric narratives are prominent.

89. "Across the world, more than half of all annual tropical rainfall is caused by... widespread systems of clouds — spanning hundreds of square kilometres or more — that spring up when hot air carrying moisture rises and cools at high altitudes. Such 'mesoscale' systems of thunderstorms can grow quickly in the tropics, and their development is difficult to spot on patchy meteorological networks. And because scientists are still learning how they grow, their behaviour and impacts are difficult to forecast in advance. In 2019, similar mesoscale systems dropped 50 millimetres of rain within two hours in Kerala, leading to flash floods and landslides."

Vaidyanathan, G. (2023). How India is battling deadly rain storms as climate change bites. Nature,614(7947), 210–213.

Which of the following statement can NOT be said based on the information paragraph above:

(a) Mesoscale systems are difficult to observe because of patchy meteorological networks.
(b) The growth and behaviour of mesoscale systems are clearly understood by the scientific community
(c) Mesoscale systems are difficult to forecast because there is a lot to be learnt about them.
(d) Flash floods in Kerala occurred due to fast growing thunderstorms.

90. Based on the paragraph below, answer the questions that follow.

India is in the midst of the biggest climate experiment the world has ever known. It's a test that aims to transform a nation marked by deep economic inequality and heavily polluting coal power to one where families drive electric scooters and cool their homes with the sun's energy. And it (the transformation) could determine whether global temperatures exceed limits beyond which climate impacts become increasingly disastrous. *Schonhardt, S. (2023, February 10). Why the Climate Fight Will Fail without India. Scientific American.*

Which of the following, if true, would most weaken the speaker's claim?
(a) India's per capita CO_2 emissions is far below world average.
(b) India's CO_2 emissions is expected to reduce significantly by 2050
(c) India's CO_2 emissions is expected to increase significantly by 2050
(d) India's overall CO_2 emissions will remain far below world average

91. Which of the following, if true, would most strengthen the speaker's claim?
(a) India is the first example of a developing country that can simultaneously develop while mitigating emissions.
(b) India's emissions are low compared to other developing countries
(c) So far other low-income countries have met development goals without also causing greenhouse gas emissions.
(d) India's emissions are comparable to other developing countries

92. Based on the passage below, answer the questions that follow.

In addition to the political and economic dangers relevant to all platforms, edtech platforms present a far graver threat. Education is not another market good where non-consumption, stratified consumption or fraudulent service is tenable. Education is a public good and needs to be universal, equitable, of acceptable quality, and not stratified based on one's ability to pay. It has been enacted as a fundamental right of children aged between 6 and 14 years, with increasing consensus to extend this to 3–18 years. The education policy declares the aim of education to be that of transforming the society towards the constitutional ideals of justice, liberty, equality, and fraternity. The edtech market is an antithesis of these ideals. Exploiting parents and children desperate for the silver bullet to 'make it big'... *Gurumuthy Kasinathan (2023) Platform Capitalism and Edtech, EPW 57(4)*

Which of the following, if true, strengthens the speaker's claim
(a) platform-based education improves students' grades
(b) platform-based education is becoming more affordable
(c) there is no difference between the effectiveness of platform-based edtech, when it comes to wealth or background of the student
(d) of all users of platform-based edtech, a vast majority are wealthy students

93. Which of the following, if true, weakens the speaker's claim
(a) there is no difference between the effectiveness of platform-based edtech, when it comes to wealth or background of the student
(b) platform-based edtech companies are moving towards business models that allow free access to their services
(c) several platform-based edtech startups are shutting down or going bankrupt
(d) platform-based edtech companies have spend large sums on charity

94. Based on the passage below, answer the questions that follow.
Urban congestion has been a common phenomenon on Indian roads, primarily because various kinds of vehicles move at different speeds, and there does not exist any appreciable degree of separation of lanes for different modes of transportation (Badami 2005) *Vineet Abhishek (2020) Inadequate urban transportation facilities leave the poor in India high and dry, EPW, 55(28-29).*

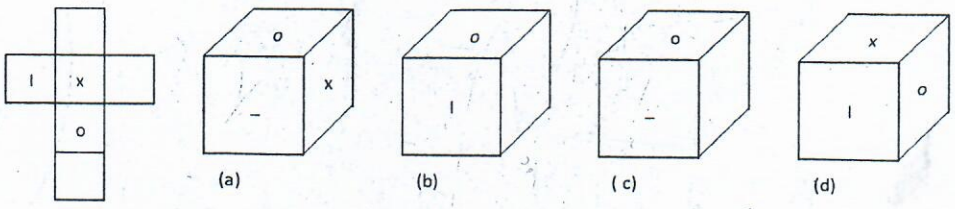
Which of the following, if true, strengthens the speaker's claim
(a) all vehicles move slowly when streets are congested
(b) some cities are building metro systems
(c) separation of traffic by mode leads to smooth but slow traffic
(d) some motorcycle riders are able to move quickly through congested traffic

95. Which of the following, if true, weakens the speaker's claim
(a) lanes are marked clearly on most streets
(b) there are many accidents
(c) there is also high congestion in cities that have a high degree of separation of vehicle by mode
(d) there is no congestion from 10pm to 6am

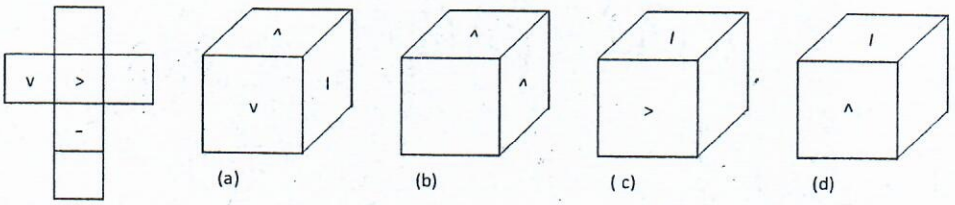
Non-verbal Reasoning

Q 96-100. Which box is most similar to the box formed by folding the paper shown in the first (leftmost) diagram?

96



97



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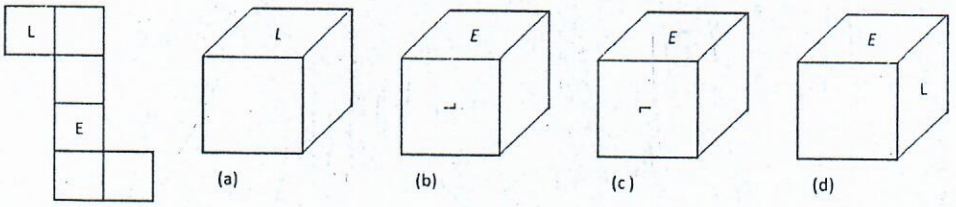

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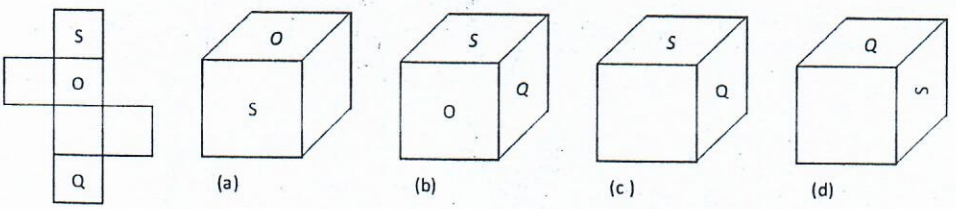
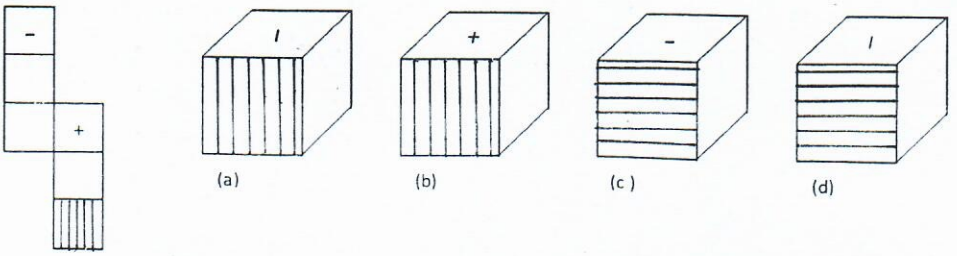
100