Mock Test Series 1.0

Mock Test – 07

VARC

Directions (1–4): Read the following passage and answer the questions that follow:

Years ago, during a stop in Phnom Penh while on a backpacking trip through Southeast Asia, I visited Tuol Sleng, a museum of the Cambodian genocide, and Choeung Ek, the killing fields. Both were places where thousands of victims of the Khmer Rouge had been murdered; now, tourists moved along their hallways and paths, mostly in silence. I still remember staring down at my toes in dusty sandals, stopped just short of the human bone fragments coming up through the dirt, as a guide held his hand out to keep me moving.

After leaving, I couldn't stop thinking about my visit. The terrible history of what had happened at these sites haunted me, as did their material remains, but so did the troubling decision I made to be there at all. Why had I chosen to go to these places? It felt like a responsibility, in a way — to learn about the country I was traveling through, to pay my respects, clumsily, to the dead — but I was disturbed, too, by what I had done. Was I just a voyeur of other people's pain?

Sites like these fall under the umbrella of what can be called difficult heritage: the places, artifacts, stories, and practices that we have inherited from the past, and use, in some fashion, today. We tangle our presents together with our pasts. As an American I know the stories we tell about our history as a nation, and the icons in which they are rooted: the Liberty Bell; the Mayflower; the Declaration of Independence and the Constitution that are on display in the National Archives. People often think of heritage as something they're proud of, a unifying point around which to coalesce. But heritage comprises the horrible parts of history, too, the ones many would prefer to forget, or over which societies continue to come into conflict. In America, plantations and buildings still standing today, built by enslaved people, are part of our heritage; so are the sites of battles and the stolen lands that were part of the genocide against Native populations. And even more heritage has been lost through neglect and deliberate destruction, as Jill Lepore explains in a story below.

After that trip to Cambodia, I went on to study difficult heritage professionally as an archaeologist and anthropologist of Rwanda. I learned how Rwandans were using the remains of their terrible past — the genocide committed against the Tutsi population in 1994 — in memorials that served as sites of mourning but also places of memory and education (and, for that matter, tourism, just like the Cambodian ones). In a way, the next decade of my life was shaped by those questions to which I had no good answers. Not only the ones about what I was doing there as a tourist encountering mass atrocity, but even broader ones, too: What do we do now with heritage that raises questions about pain, suffering, and our human pasts as both victims and perpetrators? How do we make these decisions today, and who has the right to do so? What kinds of values and politics guide our choices?

Even purportedly straightforward and "unifying" heritage has its faultlines: The Declaration of Independence's "We the People" can mean something quite different to the descendants of Americans who weren't counted as fully human in 1776 than to the descendants of those who were. Once you start digging, as the pieces in this reading list do, you find difficult heritage all around you. Museums are full of art and artifacts taken by colonial and genocidal forces. Public monuments commemorate people whose legacies are often, to put it gently, conflicted. Even cultural practices that are today seen as cheerful or entertaining can mask darker pasts, like Sweden's Easter witches, who bring something like Halloween to springtime.

As the global protests calling for the removal of controversial statues and monuments in recent years have shown, people care deeply about what we do with the objects and places that make up our heritage — what we save, and what we destroy. What we do with heritage reflects how we understand ourselves: who we were, who we are, and who we want to be.

1. All of the following statements may be considered valid inferences from the passage, EXCEPT:
   (a) Heritage is often seen as a positive and unifying force, but it also includes difficult and painful parts of history that many would prefer to forget.
   (b) Difficult heritage can be used as sites of mourning, memory, education, and tourism, but it also raises questions about our human past as both victims and perpetrators.
   (c) The author of the passage argues that it is important to remember and learn from difficult heritage, but also acknowledges the ethical and moral dilemmas surrounding the use and interpretation of such heritage.
   (d) The only way to properly pay respect to the victims of genocide and other atrocities is by visiting and experiencing the places where they occurred, even if it means being a voyeur of other people's pain.

2. Which one of the following best describes the author's attitude towards difficult heritage?
   (a) The author believes that difficult heritage should be celebrated and embraced as a way to unify society and promote a shared sense of identity.
   (b) The author is troubled by difficult heritage, and questions the ethics and morality of using it for purposes such as tourism and entertainment.
   (c) The author views difficult heritage as a complex and multifaceted issue, raising questions about our human pasts as both victims and perpetrators.
   (d) The author is critical of the use of difficult heritage for memorialization, and argues that it perpetuates a culture of victimhood and blame.

3. Which one of the following statements, if true, would be the most direct extension of the arguments in the passage?
   (a) Difficult heritage can have a negative impact on society, as it can lead to further conflicts and division.
   (b) The decision on what to do with difficult heritage should be made by the people who have suffered the most from it.
   (c) People have a responsibility to learn about and preserve difficult heritage, even if it makes them uncomfortable.
   (d) The way in which difficult heritage is treated can have an impact on the way future generations understand their history.

4. Which one of the following best describes the style of the passage?
   (a) Argumentative
   (b) Descriptive
   (c) Reflective
   (d) Expository

Directions (5–8): Read the following passage and answer the questions that follow:

I'm on a mission to become human again. Not through good deeds, being in nature, or communing with the universe, etc., — no — for me the single most humane thing I felt that I could do was to get off of social media.

Deleting accounts seemed a simple, concrete action to take, but I found it anything but. I'm a freelance writer, reliant on Twitter for pitch calls, as well as the all–important Discourse of the Day. While Instagram's main purpose appears to be to make me feel terrible, the stories remain helpful for getting eyes on my writing. While Facebook operates as my Rolodex of family and friends, my community bulletin board — increasingly, the only way to learn who's still alive and who's dead.

This is known as "social lock–in," where social networks monopolize our experiences and make it impossible to live our lives outside of the purview of the platform. It's also a feature of surveillance capitalism, a term coined by Shoshana Zuboff to showcase how capitalism no longer simply controls our purchasing power but manipulates our human behavior at scale. Every search query, every post liked, even the amount of time your eyes spend looking at a specific image on your screen is tracked, quantified, and mined to learn more about you, the decisions you make, and why. That information can then be used against you — to sell you more products, to make you more susceptible to suggestions, to know things about you before you even

know them yourself. Thanks to social media, capitalism doesn't just require cornering the market on household products; powerful, unknown players can now corner the market on democracy for the right price.

As scary as surveillance capitalism sounds, for me, the true fear resides in my slow loss of privacy, and with it my sense of sanctuary.

I'm a librarian — a notoriously privacy–obsessed profession. Librarians have always believed that it is your inalienable right to learn whatever it is you want without fear of anyone looking over your shoulder. We were some of the first to cry foul over seemingly small encroachments on digital privacy, such as individual search queries.

We like to believe that our own personal searches, such as "best exercises to improve back posture," are small fry — too insignificant to matter. After all, we have nothing to hide. But we must look at the big picture, much the same way that surveillance capitalist companies, like Google, do. Our personal decisions about privacy are hardly private — they have always been a public affair. The more we allow tech and social media companies to chip away at our personal privacy, the more they can commercialize our privacy at scale. Everything, even our most interior sense of self, is for sale.

According to Jaron Lanier, computer scientist, futurist, and frequent tech critic, deleting our social media accounts is "the most finely targeted way to resist the insanity of our times" — and it's the only way to regain our humanity in an increasingly inhumane world.

5. We can infer all of the following about the author's profession from the passage EXCEPT that:
   (a) The author is knowledgeable about digital privacy & has a vested interest in protecting it.
   (b) The author believes in the inalienable right to learn whatever it is you want without fear of anyone looking over your shoulder.
   (c) The author's job requires the use of social media for various purposes.
   (d) The author is a writer who relies on social media for exposure and networking.

6. Which one of the following statements best describes what the passage is about?

   (a) The harmful effects of social media on personal privacy and humanity.
   (b) The importance of librarians in protecting personal privacy and freedom of information.
   (c) The dangers of surveillance capitalism and its impact on democracy.
   (d) The benefits of deleting social media accounts and living life without social media.

7. Which one of the following statements describes what the author would have logically discussed next if the passage continued?
   (a) The potential psychological effects of living in a world where privacy is no longer respected.
   (b) How the rise of surveillance capitalism has affected political systems and democracy.
   (c) The importance of taking concrete steps to preserve personal privacy, such as using ad–blocking software.
   (d) The ways in which social media companies are adapting to concerns about privacy.

8. Which one of the following scenarios, if false, could be seen as supporting the passage?
   (a) Social media and tech companies are necessary evils for the functioning of modern society.
   (b) The personal data collected by social media and tech companies is always used ethically.
   (c) Individual search queries on search engines like Google do not pose a significant threat to personal privacy.
   (d) People have the right to live their lives outside of the purview of social media platforms.

Directions (9–12): Read the following passage and answer the questions that follow:

Last weekend, a friend forwarded me a video. I clicked on the link nonchalantly, expecting a joyful puppy or perhaps a triumphant head of lettuce. But as the clip played, I sat up straighter, a coldness creeping over my heart. It started innocently enough, with a woman browsing in a store, but something catches her eye, and the chilling wall is revealed: A wall of '90s Halloween costumes.

For $5, you can wrap a velvet choker around your neck, adorn your hair with butterfly clips, and clasp a fake Nokia 3310 to your ear. Ten dollars gets you a black slip dress, the kind I remember proudly pairing with purple Doc Martens for a Red Hot Chili Peppers concert back in '96. The bomber jacket was a particular twist of the knife — at age 13, owning a bomber was my raison d'être, and I harassed my mum into buying me a particularly hideous sky–blue version I wore diligently for the rest of the summer, no matter if it rained or shined. (It really didn't matter: puffed cloth proved equally ineffective against wet or cold.)

If I'd felt old when my local club changed '80s Night to '90s Night — presumably deciding those nostalgic for eighties classics should now be in bed by nine with a cup of cocoa — the Halloween wall made me feel like I'd picked the wrong chalice. Not only had my teenage outfits morphed into vintage costumes, but they'd done so just as I was swaddling myself in a cocoon of nostalgia, blissfully unaware of just how historical it was.

I had come across Buffy the Vampire Slayer on Disney+, and dipped in for a quick reunion. I was now on season four and in deep, reveling in all those knitted jumpers and chunky, chunky shoes. My teenage self would have been agog — whole seasons on tap was surely witchcraft only Willow could pull off. When Buffy first wielded a stake and a pun, back in 1997, I was lucky to even see a complete episode. Buffy aired on a Friday night. Since I was spending that timeslot getting rejected from bars, I would set up a video cassette to record it (you know the sort, you can buy a replica from your local Halloween store). Repeatedly instructing my parents to press record at eight, I was lucky to see half a show, with mum inevitably only remembering her mission by eight–thirty.

Comic–loving, nerdy Xander used to be my favorite character. But clearly, I had overlooked his more misogynistic traits. During the rewatch, I noticed that, despite having minimal powers compared to his badass female friends, he oozes sexual entitlement. Not only does he constantly make suggestive comments to Buffy, but he's prone to quips like, "Just meet me at Willow's house in half an hour and wear something trashy…er." The creator of Buffy, Joss Whedon, has admitted Xander is based on himself, so it is of little wonder that, years later, some of the Buffy actors went public with the toxic work environment Whedon created.

Sadly, no one called Whedon out at the time, and perhaps it's misleading to say I missed Xander's misogyny. It would be more accurate to admit that I accepted it. After all, in '90s England, that sort of behavior would have been labeled as "banter" and ignored — laughed at even. It was an age in which shows such as TFI Friday had a "Freak or Unique" and "Ugly Bloke" spot, and FHM could project an image of Gail Porter's behind onto the Houses of Parliament (without her permission, as a joke). The ladette was queen, and the king was a Bantersaurus Rex. Taking anything too seriously was deeply uncool. The Xander/Whedon–style snark was the tone of the decade.

So maybe I was too quick to complain that the '90s — butterfly clips, sexism, and all — had been unfairly relegated to the realm of Halloween costumes. Before mourning my youth too deeply, I needed to spend more time considering this decade beyond the scrunchies and acid–washed jeans. I had rewatched Buffy; now, it was time to reread Rebecca Schuman's thoughtful 2018 Longreads series, The '90s Are Old. Schuman is a wise guide, one that could help me unpack the confusing cultural legacy of this decade, and decide if it really was time to let go.

9. All of the following inferences from the passage are false, EXCEPT:
   (a) The author had no idea that their teenage outfits had become vintage costumes before encountering the Halloween wall.
   (b) The author never questioned Xander's misogyny during their initial viewing of Buffy the Vampire Slayer.
   (c) The author enjoyed watching Buffy the Vampire Slayer in the '90s without any interruptions or difficulties.
   (d) The author is nostalgic for the '90s and acknowledges the need to reconsider their understanding of the decade.

10. Which one of the following, if true about the author's rewatching of Buffy the Vampire Slayer, would invalidate the purpose of revisiting the '90s

through Rebecca Schuman's Longreads series in the passage?
(a) The author watches Buffy the Vampire Slayer purely for the fashion and style elements.
(b) The author's rewatching of Buffy the Vampire Slayer has made them realize the extent of misogyny present during the '90s.
(c) The author is unable to remember any of the characters or storylines from Buffy the Vampire Slayer during their rewatch.
(d) The author finds that their opinion of Xander has not changed during the rewatch of Buffy the Vampire Slayer.

11. The author lists all of the following as reasons for feeling old in the passage EXCEPT:
(a) Seeing the Halloween wall featuring '90s costumes
(b) The local club changing '80s Night to '90s Night
(c) The inability to access full seasons of TV shows during the '90s
(d) Rewatching Buffy the Vampire Slayer and realizing Xander's misogyny

12. A fundamental conclusion by the author is that:
(a) The '90s fashion trends are now considered outdated and vintage
(b) The '90s should be remembered solely for their sexism and misogyny
(c) The author's nostalgic feelings are more important than the negative aspects of the '90s
(d) The author needs to reassess their understanding and appreciation of the '90s beyond superficial aspects

Directions (13–16): Read the following passage and answer the questions that follow:

I've been in a lot of conversations lately in which a two–word phrase is spoken — "true crime" — and then, during the ensuing beat of silence, everyone reads the room and modulates their reactions based on the expressions of everyone else. Or maybe it's just me. For some, the phrase simply sparks exclamations and recommendations, stories of late nights spent binging The

Jinx or I'll Be Gone in the Dark. But others wince, because no matter how sophisticated the storytelling or agreeable the politics, an icky aftertaste remains.

Since 2014, when the podcast Serial inaugurated the new true–crime boom, cultural critics have tried to puzzle out whether these factually accurate but necessarily sculpted stories of murder, rape, and grift are culturally valuable, corrosive, or both. Among the critiques: We're skewing our view of who is the most vulnerable in America through a myopic focus on white women victims. We've "rotted" women's brains with paranoia and "[entrenched] the flaws of America's criminal justice system."

On the other hand, as lawyer and podcast host Rabia Chaudry recently pointed out to the New York Times, the genre can also invite more scrutiny of the justice system. Over the last five years, while writing a book about the death penalty, and a narrative story about a controversial murder investigation, I've noticed that our debates sometimes fail to articulate that when we say "true crime," we're really talking about a huge variety of story types, one of which is especially good at taking readers right to the heart of important policy questions.

I'll call it the "Wrongful Conviction Story," a subgenre of true crime that examines the failures of police, courts, and other government actors, and questions whether they've caught and punished the correct person. I'm not calling it the "Innocence Story," because "wrongful" is a subjective adjective, implying an argument is being made, while "innocence" implies the writer can fully prove the objective truth, which, usually, they can't. These stories aren't necessarily out to answer whether someone is guilty or innocent. They're about the failures of a system that ensnares millions of Americans each year, innocent and guilty.

A few years ago, I heard another writer say that magazine editors didn't want these stories anymore, because they were no longer "surprising" to readers. That may be overstated, but it is true that journalists need to keep innovating in terms of how we build narratives if we're going to get readers to follow us into a system full of misery, pain, and jargon like "voir dire" and "Brady violation," showing them the real thing rather than the tidy heroes–and–villains worlds of Law & Order and NCIS.

I've collected a handful of my favorite examples of the Wrongful Conviction Story. Each represents a further slice

of the subgenre, along with other stories I think are worth your attention if you want to go deeper, whether because you're a fellow journalist, a lawyer (very much a profession in which one tells stories), or just a curious reader.

13. Which of the following can be a logical source of the passage?
   (a) A book review on a popular true crime novel
   (b) An article discussing the variety within the true crime genre
   (c) A podcast episode about a specific wrongful conviction case
   (d) An opinion piece arguing against the true crime genre's ethical implications

14. Which one of the following statements contradicts the arguments of the passage?
   (a) True crime stories do not offer any cultural value.
   (b) The "Wrongful Conviction Story" subgenre seeks to highlight the flaws in the justice system.
   (c) True crime genre comprises a wide variety of story types.
   (d) Journalists must find new ways to build narratives in order to keep readers engaged.

15. Which of the following statements best represents the essence of the passage?
   (a) True crime stories are often criticized for their negative impact on society and the criminal justice system.
   (b) The true crime genre, particularly the Wrongful Conviction Story subgenre, has the potential to engage readers and draw attention to important policy issues within the criminal justice system.
   (c) Journalists should avoid writing about true crime stories as they perpetuate stereotypes and contribute to societal paranoia.
   (d) The popularity of true crime stories is solely attributed to their entertainment value and sensationalism.

16. Which one of the following sets of words/phrases best encapsulates the issues discussed in the passage?
   (a) True crime, cultural value, wrongful conviction, innovation
   (b) Sensationalism, entertainment, white women victims, Law & Order
   (c) Crime podcasts, paranoia, myopic focus, objective truth
   (d) Narrative storytelling, scrutiny, justice system, heroes and villains

17. Carefully read the statements in the questions below and arrange them in a logical order.
   (1) People started to become more aware of the environmental problems caused by plastic waste.
   (2) In the late 20th century, plastic began to be mass–produced, replacing traditional materials like wood, glass, and metal.
   (3) Governments and corporations began taking steps to reduce plastic waste, promote recycling, and develop alternatives to plastic.
   (4) The convenience and versatility of plastic made it a popular choice for many applications, leading to its widespread use.

18. Carefully read the statements in the questions below and arrange them in a logical order.
   (1) This led to the development of new farming techniques, tools, and systems to increase agricultural production.
   (2) The Agricultural Revolution was a period of significant agricultural development that occurred in the 18th and early 19th centuries.
   (3) The demand for food increased as the population grew and urbanization expanded.
   (4) The revolution began in England and spread across Europe and other parts of the world, transforming traditional agricultural practices.

19. Carefully read the statements in the questions below and arrange them in a logical order.

(1) Leonardo da Vinci's extensive knowledge in various fields made him a true Renaissance polymath.

(2) Many accomplished artists and scientists emerged during the Renaissance, contributing significantly to the era's advancements.

(3) Da Vinci's masterpiece, the Mona Lisa, is widely regarded as one of the most famous and enigmatic works of art in history.

(4) The Renaissance was a period of renewed interest in art, science, and literature that took place during the 14th to the 17th century.

20. Carefully read the statements in the questions below and arrange them in a logical order.

(1) Charles Darwin developed the theory of natural selection, which became a cornerstone of modern evolutionary thought.

(2) The concept of natural selection suggests that species with traits favorable for survival and reproduction have a higher likelihood of passing those traits to the next generation.

(3) The theory of evolution has undergone significant changes and refinements since Darwin's time, but the fundamental principles remain intact.

(4) Before Darwin, the dominant theory was that all species were created independently, and their traits were fixed.

21. Which of the following statements is ODD ONE OUT?

Five sentences related to the topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the Odd One Out.

1. For centuries, Antarctica was merely an imaginary concept of an 'ant–Arctic', as propounded by Aristotle.

2. Maori and other seafaring Polynesian peoples, living relatively nearby, were aware of the region but never settled due to its inhospitable environment.

3. Antarctica's discovery is attributed to three separate groups in 1820, including a Russian expedition, a British expedition, and an American seal–hunter named Nathaniel Palmer.

4. Over time, the Antarctic evolved from a hunting ground that almost led some species to extinction, to the world's largest open–air science laboratory, and now to a highly protected environment.

5. In contemporary times, Antarctica presents a paradox due to its severe environmental protection policies and the ongoing effects of climate change.

22. Which of the following statements is ODD ONE OUT?

Five sentences related to the topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the Odd One Out.

1. Xenotransplantation is the process of grafting or transplanting organs or tissues between members of different species.

2. Despite the countless benefits of renewable energy, society continues to rely heavily on fossil fuels for energy.

3. This technique, while ethically controversial, could help address the shortage of human organs available for transplantation.

4. Every year, more than 1 trillion animals are killed to meet various human needs, including food, clothing, and scientific research.

5. The ethics of xenotransplantation are often defended by the assertion that human lives carry more ethical weight.

23. Read the following passage and answer the question that follows:

Every kid who grew up in the '60s and '70s remembers Evel Knievel in his star–spangled jumpsuit, thrilling us all with death–defying (and bone–crushing) stunts — but hundreds of years before Knievel revved up his motorbike, Hawaiian divers were leaping feet–first from massive crags

in lele kawa, or cliff diving. Further back still, the medieval sport of jousting frequently resulted in injury or death despite its many safety–minded rules; in ancient Greece, athletes fought in the deadly mixed–martial–arts of pankration, a combat in which biting and gouging were the only two methods you couldn't use to disable your opponent. From Minoan bull–leaping to the Algonquin ball game of pasuckuakohowog, in which hundreds of competitors risked life and limb on the same field, humans have long engaged in (and watched) the riskiest contests imaginable. In modern times, the appeal of extreme sports can be attributed to twin factors: social media allowing for easy transmission of eye–catching escapades to a global audience, and new technology making even the most challenging of pursuits considerably safer. Bungee jumping, for example, has its origins in the 1980s, when New Zealander Henry van Asch and a fellow Kiwi friend came up with the novel idea of hurling yourself off a bridge attached to an elastic rope. Back then, such an endeavor appealed to a small group of adrenaline–chasers willing to risk their lives for the thrill. Nowadays, bungee jumping is statistically as safe as skydiving and is widely viewed as a relatively low–risk activity for any pleasure seeker.

Which of the following best summarizes the passage?

(a) Social media and technology have made extreme sports more popular than ever.
(b) The history of extreme sports and their evolution into modern, safer activities.
(c) The transformation of bungee jumping from a risky pursuit to a low–risk activity.
(d) The role of extreme sports in shaping human culture throughout history.

24. Read the following passage and answer the question that follows:

In recalling the origins of the superhero genre, Spiegelman stresses that the immaturity often ascribed to comic books was as prevalent in the 1930s as it is in the present. If there's any notable difference, it likely lies in the fact that publishers themselves were aware of this and consequently chose not to prioritize making the high–quality products we see today. ("Just give them a lot of action and don't use too many words," publisher Martin Goodman once told Stan Lee.) Though Superman's debut shifted the medium by introducing an archetype that captured the hearts (and dimes) of millions of readers, the sentiment that comic books were for immature audiences endured. But the adventures of these heroes and the lives of the creators who made them tell a different tale. Bold as it was to introduce Captain America by having him punch Hitler on the cover of his first issue in 1941, the impact of his debut is better appreciated if you understand how tolerant the U.S. was toward Nazi sympathizers until the country properly entered World War II. Just two years prior to Cap's debut, thousands of members of the German American Bund rallied in New York to express their approval of Hitler's antisemitic sentiments. The sales of superhero comics began to dwindle after the war, which not only suggests that consumers were aware of their political nature, but implies that publishers were willing to exploit those politics for profit.

Which of the following best summarizes the passage?

(a) The political context and significance of early superhero comics.
(b) The evolution of the superhero genre and its impact on American society.
(c) The origin of comic books and their initial low–quality production.
(d) The shifting perception of comic books from immature to complex over time.

LRDI

Directions (25–28): Read the following passage and answer the questions that follow:

In any coaching institute, 4 professors A, B, C and D take Quantitative Aptitude classes. The classes are scheduled in two slots Morning and evening during all seven days of the week. None of the professors is allowed to take classes for three consecutive days and also can not take classes in the same slot, morning and evening, for two consecutive days. Also none of the professors is allowed to take classes in both slots on any single day.

Following information is given about their class scheduling:

(1) Classes on Tuesday Morning and Wednesday evening are taken by professor A.

(2) Prof B and Prof C take the same number of classes every week.

(3) Number of morning slots for each professor is the same as the number of evening slots.

(4) Wednesday morning and Friday evening slots are allotted to Prof D and Sunday evening and Monday morning slots are allotted to Prof B.

25. In how many ways can the four professors take classes within a particular week?
   (a) 2   (b) 4
   (c) 1   (d) None of these

26. What is the number of classes taken by Professor A in the week?

27. Who took Monday evening class?
   (a) C
   (b) Either A or D
   (c) Either D or C
   (d) D

28. If the amount charged per class by professor A and professor C is 2500 and 2700 respectively, then what is the total amount earned by both the professors within a particular week?

Directions (29–33): Read the following passage and answer the questions that follow:

The pie chart represents the percentage wise distribution of the number of NRIs in five cities. The bar graph represents the percentage of males among them.
Total number of NRIs in five cities = 40000
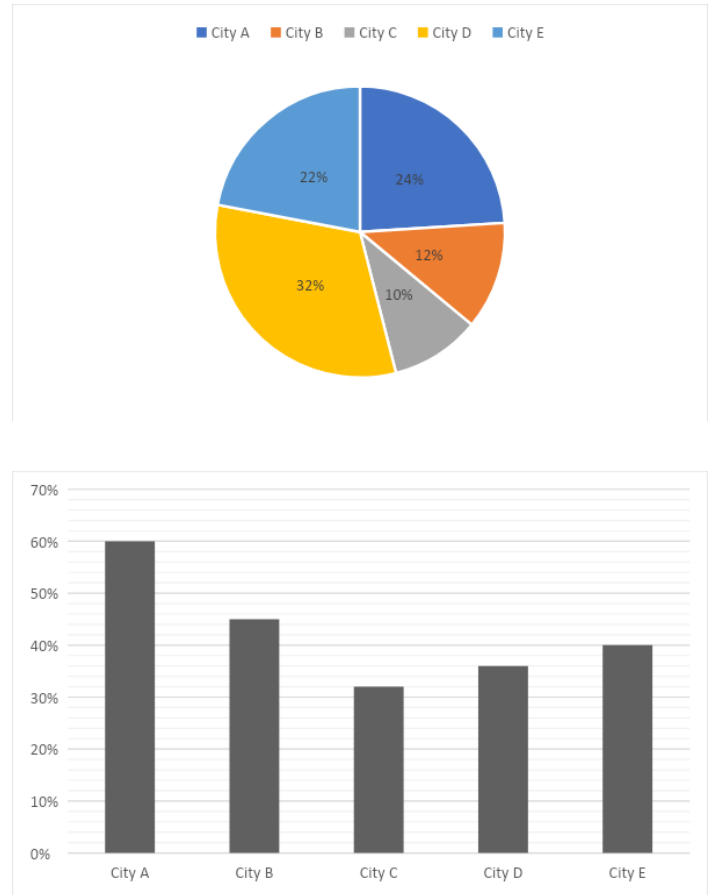
29. Number of male NRIs in city A is approximately what percentage of the number of male NRIs in city E?
   (a) 126%   (b) 132%
   (c) 156%   (d) 164%

30. If total population of city C is 160% more than the total number of NRIs in that city, and the ratio of number of males and females is 7:6 respectively, find the total number of males in city C.

31. The difference between the number of female NRIs in city B and the number of female NRIs in city D is:

32. Number of female NRIs are minimum in which city?

(a) City A   (b) City B
(c) City C   (d) City D

33. The difference between the number of male NRIs in city A and the number of male NRIs in city C is:

Directions (34–38): Read the following passage and answer the questions that follow:

Eight dancers were invited as guests in a dance school on different dates of the same year. The number of days between the dates on which any two consecutive guests were invited is more than 5 days but less than 9 days (for example, if P was a guest on 7 November and Q was the guest immediately after P, then Q will be the guest on 14, 15 or 16 November). Each guest was given a bouquet of flowers and the flowers were among roses, lotuses, orchids, lilacs, lilies, camellias, lavenders and chrysanthemums. No two guests were invited on the same day or given the same flowers.

The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. The one who was invited immediately before O was given orchids. O was not the last guest to be invited. The one who was invited immediately after R was given lilies. R was invited before B. O was not given lilies. There were 14 days in between the dates on which X and the one who was given roses were invited. T was not given roses. There were 8 days in between the dates on which T was invited and the guest immediately before him was invited. The one who was given camellias was invited as a guest on 11 August. H and X were invited in the same month. H was invited before 19 August. T was invited immediately before the one who was given lotuses. There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. There were more than 7 days in between the dates on which N and the one who was given roses were invited. R was not invited in June.

NOTE: The bouquets were given to the guests such that no two consecutive guests were given flowers whose names start with the letter 'L'.

34. Who was invited immediately before the one who was given chrysanthemums?

(a) N
(b) O
(c) H
(d) None of the above

35. On which date was T invited?
(a) 12th July   (b) 2nd Aug
(c) 27th July   (d) 25th June

36. Which flowers were given to X?
(a) Lilies   (b) Chrysanthemums
(c) Lotuses   (d) Camellias

37. How many guests were invited in between the ones who were given lavenders and roses?
(a) 6   (b) 4
(c) 2   (d) None

38. Which Flower was given to H?
(a) Roses   (b) Lavender
(c) Orchids   (d) Camellias

Directions (39–44): Read the following information and answer the question the follows:

There are three houses (1), (2) and (3) to be reconstructed/redesigned for which three groups of workers are required. Three teams of seven persons each are to be selected from the following group of persons for the three houses. Each person mentioned below should be part of at least one reconstruction. Their jobs and fees (per house reconstruction) are given below

Person	Job Role	Fees charged
M	Carpenter	Rs. 4000
N	Interior Designer	Rs. 3400
O	Painter/Roofer	Rs.3600
P	Roofer	Rs. 4300
Q	Painter/Carpenter	Rs. 3000
R	Electrician	Rs. 3500
S	Electrician/Carpenter	Rs. 3900
T	Interior Designer/Painter	Rs. 4200
V	Painter/Carpenter	Rs. 3800

For reconstructing each house, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. One person will work

on only one job (if he can do more than one job) per reconstruction. Some of the conditions that should be followed while selecting the 7 workers are as follows:

(i) House (2) should have an interior designer in its reconstruction and redesigning.
(ii) More than two painters should not be in any team. Two roofers are required for the reconstruction of house (1).
(iii) If Q and V are in the same team, then V will not be the carpenter.
(iv) S and T will not work together in the same team.
(v) P and R will not work together in the reconstruction of house (1) or house (2).
(vi) If N and O are in the same team more than once, then O will work as a roofer only once. O will not work in the reconstruction of house (3).
(vii) The total budget for the three houses (1), (2) and (3) are * 29000, * 28000 and * 27000 respectively.

Note: Not necessarily the total fees charged by the team of the three houses to be the same as the total budget of the three houses.

39. Which of the following is the correct job role of a person who is part of the team in the reconstruction of house (2)?
(a) Painter – Q
(b) Roofer – O
(c) Interior Designer – T
(d) Electrician – S

40. What is the difference between the total fees charged by the teams for house (1) and house (3)?

41. Which of the following houses will have two interior designers for its reconstruction?
I. House (1)
II. House (2)
III. House (3)
(a) Both I and II
(b) Only II
(c) Only I
(d) Cannot be determined

42. Which of the following persons will definitely work for all the three houses in the same role?
(a) V   (b) S
(c) Q   (d) R

43. What are the total fees charged by the painters and carpenters in the reconstruction of house (1)?

44. What was the total amount charged by the team for House 3?
(a) 26,400   (b) 26,800
(c) 26,200   (d) 26,000

QUANT

45. The ratio of sum till n^{th} term of two AP series is $(6n + 4):(2n + 1)$, then find the ratio of their 11th terms.
(a) 43:130   (b) 79:87
(c) 130:43   (d) 12:140

46. Find the area of the shaded region in the following figure.

(a) $\frac{9}{2}$ (d) 48 unit ^{2} (b) (d) 8 unit ^{2}

(c) $\left(\frac{9}{2} - \pi\right)$ unit ^{2} (d) $\frac{9}{2} - \pi(4$ unit ^{2}
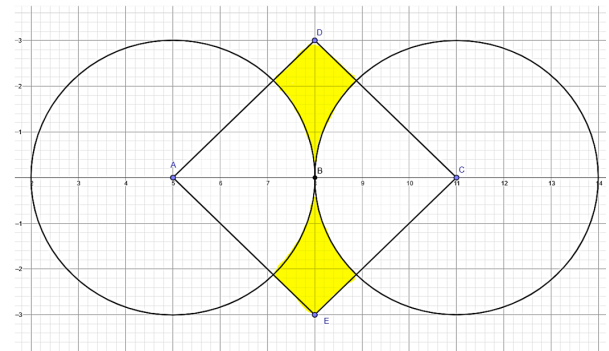
47. Rajnikant gives 30% of his monthly income to his sister, and 60% of his remaining income he invests in business and health insurance policy in the ratio of 7: 5. If the difference between the money he gave to his sister and the money he spent on the health insurance policy is Rs. 1750, then find the difference between the money he gave to his sister and the money he spent in business. [TITA]

48. Let
$$2\log_4\left(5^{\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\dots}\right)$$
$$=\left(\log_4\left(y^2-3y+8\right)\right)\left(\log_6 5\right).$$
Then, what is the maximum value of y?

49. Let
$$\frac{0+\cos 7b\cos 3c}{0-\cos 2\cos -5a}=\left(\frac{\quad}{\quad}\right)^2,$$
where $a^2 + 9b^2 + c^2 + 16a + 24b - 10c + 105 = 0$. Then, find the value of cot θ.

(a) 1

(b) $-\dfrac{22211}{5100}$

(c) $-\dfrac{17}{150}$

(d) $-\dfrac{289}{2550}$

50. Find the minimum value of the expression
$$\frac{49x^4 e^{4x} + 64}{x^2 e^{2x}}$$

51. In a group of entrepreneurs, 26% of the entrepreneur are at the age of 18–25 years, while the age of the rests are above 25 years old. If 75% of the entrepreneurs owns start–up companies, and 25% of the entrepreneurs who owns start–ups, are at the age of 18–25 years, then the percentage of entrepreneurs above 25 years old among the large company owner is:

52. A fighter Jet flew at one–fourth of its usual speed, and hence reached the destination 42 minutes after the scheduled time. On its return journey, the Jet initially flew at its usual speed for 7 minutes but then landed for 2 minutes due to an emergency. The percentage by which the Jet must now increase its usual speed so as to reach the destination at the scheduled time, is:

53. A number when successively divided by 8, 5 and 6 leaves respective remainders of 5, 3 and 2. What will be sum of the remainders if the original number is divided successively by 6, 5 and 2?

54. Some boys and girls participate in a cricket tournament. In the first round, every boy has to play with every other boy; in the second round, every girl has to play with every other girl. Then, in the next round every boy has to play every girl; how many matches are possible in this round if there were 120 and 91 matches in the first and second rounds (respectively)?

(a) 123   (b) 224

(c) 323   (d) 243

55. A cube's outside surface takes 18 minutes to paint. This cube is divided into 216 identical smaller cubes. All these 216 smaller cubes are split into three groups such that in each group, all the cubes can be put together to form an individual larger cube. How much time in total (in minutes) will it take to paint the outer surface of all the three new cubes?

(a) 20   (b) 27

(c) 30   (d) 25

56. There are 19 similar types of pebbles placed in a line. In how many ways 7 of these pebbles can be marked so that there are an odd number of pebbles between any 2 of the pebbles that are marked?

(a) 144   (b) 156

(c) 168   (d) 172

57. For the renovation of three universities in Jadavpur, Calcutta, and Bankura, the RUSA has approved 105 crores of rupees. Jadavpur University received 10 crores more than $\dfrac{5}{2}$ times the fund, Calcutta University received 15 crores more than $\dfrac{9}{5}$ times the fund, and Bankura university received 8 crores less than $\dfrac{17}{15}$ times the fund. But, the amounts received by the universities are all equal. What fraction of the total amount is received by Bankura University?

(a) $\dfrac{3}{7}$

(b) $\dfrac{4}{7}$

(c) $\dfrac{2}{5}$

(d) $\dfrac{16}{21}$

58. How many meters of cloth 4.8 metre wide will be required to make a conical tent, the radius of whose base is 12 m and height is 35 m?
(a) 82.5 π
(b) 92.5 π
(c) 102.5 π
(d) 112.5 π

59. What is the area of the shaded region (in cm²) in the following circle of radius 5 cm?

(a) 25π–75
(b) 25(π–2)
(c) 27
(d) 30

60. Ashwin and Dhoni buy 2 bats for ₹ 1500 and ₹ 3000 respectively. Ashwin marks his bats by p%, but Dhoni marks his bats up by 3p% and offers a discount of p%. If both of them make the same non–zero profit, what is the value of p?
(a) 35
(b) 40
(c) 45
(d) 50

61. The inner portion of the circle $x^2 + y^2 = 4$ is a perfect mirror. A light ray originating from $(-5, \sqrt{3})$ and parallel to X axis enters the circle through the only hole H $(-1, \sqrt{3})$. After entering the circle, the ray goes through a series of reflections until it comes out of the circle through H. The ray after n^{th} reflection is R_n and R_0 is the inbound ray originating from $(-5, \sqrt{3})$. Find out the number of reflections after it comes out of the hole H?
(a) 1
(b) 5
(c) 6
(d) 11

62. The point (–1,7) is one of the vertices of a rectangle. If the diagonals of the rectangle are represented by the equations x –3 = 0 and y – 7 = 0, then the area of the rectangle (in square units) is (TITA)

63. $(1+\log_4 x)$ $[1+(\log_4 x)^2 + (\log_4 x)^4 = \ldots] = 2$. Find x, given (x<4).
(a) $\dfrac{3}{2}$
(b) $\dfrac{1}{4}$
(c) $\dfrac{1}{2}$
(d) 2

64. A function f(x,y) is defined as $f(x, y) = x^2 + y^2 + 5x^3 y^2$, where x and y are natural numbers. If it is known that the value of f(x, y) is odd, what is the probability that x is odd?
(a) $\dfrac{1}{2}$
(b) $\dfrac{1}{3}$
(c) $\dfrac{1}{4}$
(d) $\dfrac{2}{3}$

65. Find the range of the function f(x) = (x+4) (5–x) (x+1).
(a) $[-2,3]$
(b) $(-\infty, 20]$
(c) $(-\infty, +\infty)$
(d) $[-20, \infty)$

66. There are 100 bottles of a Pepsi, out of which only one bottle is poisoned. Anyone who tastes the Pepsi from the poisoned bottle would die in 1 hour. However, there is no harm if the Pepsi from other bottles is tasted. A test is to be conducted using rabbit to identify the poisoned bottle. What is the minimum number of rabbits needed for the test if the poisoned bottle is to be identified in exactly 1 hour time? Assume that the time taken

by the rabbit to drink the contents of the bottle is negligible and that rabbit can drink the contents of as many bottles as we make them to drink.

(a) 4   (b) 5   (c) 7   (d) 6

VARC

1.	(d)	5.	(b)	9.	(d)	13.	(b)	17.	(2413)	21.	(1)
2.	(c)	6.	(d)	10.	(b)	14.	(a)	18.	(2341)	22.	(2)
3.	(d)	7.	(d)	11.	(c)	15.	(b)	19.	(4213)	23.	(b)
4.	(c)	8.	(d)	12.	(d)	16.	(a)	20.	(4123)	24.	(a)

LRDI

25.	(c)	29.	(d)	33.	(4480)	37.	(c)	41.	(d)
26.	(2)	30.	(5600)	34.	(d)	38.	(b)	42.	(a)
27.	(d)	31.	(5552)	35.	(a)	39.	(d)	43.	(10800)
28.	(15800)	32	(b)	36.	(d)	40.	(200)	44.	(c)

QUANT

45.	(c)	50.	(112)	55.	(d)	60.	(d)	65.	(c)
46.	(d)	51	(71)	56.	(b)	61.	(b)	66.	(c)
47.	(770)	52.	(40)	57.	(b)	62.	(32)		
48.	(7)	53.	(5)	58.	(b)	63.	(d)		
49.	(b)	54.	(b)	59.	(b)	64.	(d)		

Hints & Solutions

VARC

1. **(d)**

    Option A can be considered a valid inference from the passage, as the author notes that heritage is often seen as a positive and unifying force, but also includes difficult and painful parts of history that many would prefer to forget. This is exemplified by the author's mention of American heritage, which includes both positive symbols like the Liberty Bell and negative ones like plantations built by enslaved people.

    Option B can also be considered a valid inference from the passage, as the author discusses how difficult heritage can be used for a variety of purposes, including mourning, memory, education, and even tourism. However, this heritage also raises questions about our human past as both victims and perpetrators, which the author believes are important to consider and learn from.

    Option C is another valid inference from the passage, as the author acknowledges the ethical and moral dilemmas surrounding the use and interpretation of difficult heritage. The author notes that people care deeply about what we do with the objects and places that make up our heritage, and that these decisions reflect how we understand ourselves and our past.

    Option D, however, is not a valid inference from the passage. While the author discusses their own discomfort and ethical questions surrounding their visit to sites of mass atrocity in Cambodia, they do not suggest that visiting these places is the only way to properly pay respect to the victims. In fact, the author raises broader questions about how we use and interpret difficult heritage, and how we can learn from and remember the past without being insensitive or

    voyeuristic. Therefore, option D can be eliminated as the correct answer.

2. **(c)**

    Option A is too extreme and not supported by the passage. The author does not believe that difficult heritage should be celebrated and embraced without question; in fact, the author acknowledges the complicated and troubling aspects of difficult heritage, and questions how it should be used and interpreted.

    Option B is too narrow and also not entirely accurate. While the author is troubled by difficult heritage, the author does not only question the ethics and morality of using it for tourism and entertainment. The author also raises broader questions about how we make decisions about heritage, and who has the right to do so.

    Option C is the best answer, as it accurately describes the author's attitude towards difficult heritage. The author views difficult heritage as a complex and multifaceted issue, raising questions about our human pasts as both victims and perpetrators. The author acknowledges that difficult heritage can be used for a variety of purposes, including mourning, memory, education, and even tourism, but also questions the ethical dilemmas and moral responsibilities surrounding these uses.

    Option D is too extreme and not supported by the passage. While the author acknowledges that difficult heritage can perpetuate a culture of victimhood and blame, the author does not argue that it should not be used for memorialization at all. Instead, the author raises broader questions about how we use and interpret difficult heritage, and how we can learn from and remember the past without being insensitive or voyeuristic.

3. **(d)**

Option A is too broad as it does not specifically relate to the passage's arguments about the preservation of difficult heritage, so it can be eliminated.

Option B is a possible inference from the passage, as it suggests that the decision on what to do with difficult heritage should be made by the people who have suffered the most from it. However, this option could also be considered too narrow, as the passage raises broader questions about the responsibility and politics of heritage preservation.

Option C is too extreme because the passage does not argue that people have a responsibility to preserve difficult heritage, but rather raises questions about the decision–making process and the values and politics that guide it.

Option D is the most direct extension of the passage's arguments, as it suggests that the way in which difficult heritage is treated can have an impact on the way future generations understand their history. This aligns with the passage's argument that heritage reflects how we understand ourselves and raises questions about the values and politics that guide our choices. Thus, Option D is the correct answer.

4.   **(c)**
The passage reflects on the author's personal experiences and observations, making it a reflective style of writing. The author shares their thoughts and emotions on difficult heritage and raises questions about its significance and impact on society. Therefore, options A (Argumentative) and D (Expository) can be eliminated as they involve presenting an argument or providing information, respectively. Option B (Descriptive) can be eliminated as the passage focuses more on the author's reflections rather than describing the surroundings. The passage is primarily concerned with the author's personal reflection on difficult heritage and the larger questions that arise from it, making option C (Reflective) the correct answer.

5.   **(b)**
The passage states that the author is a librarian and a privacy–obsessed profession. The author believes that it is the right of individuals to learn whatever they want without fear of being monitored. Therefore, option B is incorrect as the author does believe in the inalienable right to learn whatever one wants. Option A is supported by the statement that the author is a privacy–obsessed librarian, and this profession requires knowledge about digital privacy. Option C is supported by the statement that the author uses social media for various purposes such as networking, exposure, and staying informed. Option D is also supported by the statement that the author is a freelance writer who relies on social media for pitching and promoting their work. Therefore, options A, C, and D are all supported by the passage, making option B the correct answer.

6.   **(d)**
Option A is too broad. Although the passage does touch upon the harmful effects of social media, it goes beyond that to discuss the larger issue of surveillance capitalism and the loss of privacy. Therefore, option A is eliminated.

Option B is too narrow. While the passage does mention the author's profession as a librarian and their belief in personal privacy and freedom of information, it is not the central focus of the passage. Therefore, option B is eliminated.

Option C is a close contender. The passage discusses surveillance capitalism, how social media companies track user information and how it can be used against them. However, the passage is not just about the dangers of surveillance capitalism. It also touches upon the loss of personal privacy and the impact on individual sense of sanctuary. Additionally, the passage suggests a solution for resisting the effects of social media. Therefore, option C is eliminated.

Option D is the correct answer. The passage is primarily about the benefits of deleting social media accounts and living life without social

mission by eight–thirty." This option can be eliminated.

D. The author is nostalgic for the '90s and acknowledges the need to reconsider their understanding of the decade. This statement is true and is supported by the passage. The author's nostalgia is evident when they discuss the Halloween wall, their teenage outfits, and their deep rewatch of Buffy the Vampire Slayer. The author also acknowledges the need to reconsider their understanding of the decade by stating, "Before mourning my youth too deeply, I needed to spend more time considering this decade beyond the scrunchies and acid–washed jeans. I had rewatched Buffy; now, it was time to reread Rebecca Schuman's thoughtful 2018 Longreads series, The '90s Are Old."

Answer: D is the correct option, as it cannot be eliminated based on the BANE Theory and is supported by the passage.

10.   **(b)**

A. Alien – This statement does not correlate with the purpose of revisiting the '90s through Rebecca Schuman's Longreads series. The author wishes to explore the cultural legacy of the decade, which goes beyond fashion and style. This option can be eliminated.

B. This statement, if true, would support the purpose of revisiting the '90s through Rebecca Schuman's Longreads series. The author's realization of the extent of misogyny during the '90s highlights the need to better understand the decade's cultural legacy. This option is a plausible answer.

C. Extreme – This statement is unrelated to the purpose of revisiting the '90s through Rebecca Schuman's Longreads series. The author's inability to remember characters or storylines would not invalidate the purpose of exploring the cultural legacy of the '90s through Rebecca Schuman's Longreads series. This option can be eliminated.

D. Narrow – This statement is too narrow to invalidate the purpose of revisiting the '90s through Rebecca Schuman's Longreads series. The author's opinion of Xander is just one aspect of their experience rewatching Buffy the Vampire Slayer. Even if their opinion remains unchanged, there is still a need to explore the cultural legacy of the decade more thoroughly. This option can be eliminated.

B is the correct option. The author's realization of the extent of misogyny present during the '90s through their rewatch of Buffy the Vampire Slayer supports their decision to revisit the decade through Rebecca Schuman's Longreads series. This further exploration would provide a deeper understanding of the cultural legacy of the '90s, helping the author to determine if it is time to let go of their nostalgia.

11.   **(c)**

A. Broad – The author specifically mentions feeling old when they saw the Halloween wall displaying '90s costumes (paragraph 3). So, this option can be eliminated.

B. Broad – The author also describes feeling old when the local club changed '80s Night to '90s Night (paragraph 3). This option can be eliminated as well.

C. The inability to access full seasons of TV shows during the '90s is not a reason for the author feeling old, but it serves as a reminder of the technological limitations of the era. This is a subtle distinction, but it is enough to make this option correct.

D. Narrow – Although the author mentions rewatching Buffy the Vampire Slayer and realizing Xander's misogyny, this realization does not directly contribute to the author feeling old. Instead, it leads to a deeper understanding of the cultural context of the '90s. This option can be eliminated.

C is the correct option. The author does not list the inability to access full seasons of TV shows during the '90s as a reason for feeling old.

Instead, this serves as a reminder of the technological limitations of the era.

12. **(d)**
A. Broad – While the passage mentions '90s fashion trends as vintage and incorporated into Halloween costumes, it does not form the fundamental conclusion by the author. This option can be eliminated.
B. Extreme – Although the passage discusses sexism and misogyny in the '90s, it does not suggest that the '90s should be remembered solely for these negative aspects. This option is too extreme and can be eliminated.
C. Narrow – The author does discuss nostalgic feelings but does not conclude that these feelings are more important than the negative aspects of the '90s. This option is too narrow and can be eliminated.
D. Close – The author states that they were too quick to complain about the '90s being relegated to the realm of Halloween costumes and that they need to spend more time considering the decade beyond superficial aspects. The author plans to reread Rebecca Schuman's series to better understand the cultural legacy of the '90s. This option is the most accurate representation of the author's fundamental conclusion.
D is the correct option. The author concludes that they need to reassess their understanding and appreciation of the '90s beyond superficial aspects, such as fashion, by examining the cultural legacy of the decade more deeply.

13. **(b)**
A. Narrow – Although the passage discusses true crime stories, it does not focus on reviewing a specific novel. This option is too narrow and can be eliminated.
B. Close – The passage delves into the variety within the true crime genre, especially focusing on the "Wrongful Conviction Story" subgenre. It also mentions the importance of understanding the different types of true crime narratives and

their impact on readers. This option aligns with the overall theme and content of the passage.
C. Alien – The passage is not a podcast episode, nor does it focus on a specific wrongful conviction case. This option is alien to the content of the passage and can be eliminated.
D. Extreme – The passage does mention some critiques of the true crime genre, but it does not focus on arguing against its ethical implications. Instead, it explores the variety within the genre and the potential positive impact of certain subgenres. This option is too extreme and can be eliminated.
Answer: B is the correct option. The passage can logically be sourced from an article discussing the variety within the true crime genre, particularly focusing on the "Wrongful Conviction Story" subgenre and its significance in understanding the failures of the justice system.

14. **(a)**
A. Close – The passage discusses the various perspectives on the true crime genre, including both critiques and possible positive aspects. While some critics argue that true crime stories may be corrosive, others, like Rabia Chaudry, point out the potential for increased scrutiny of the justice system. This statement contradicts the passage's argument that true crime can have a positive impact, particularly in the "Wrongful Conviction Story" subgenre.
B. Broad – The passage specifically states that the "Wrongful Conviction Story" subgenre examines the failures of police, courts, and other government actors, questioning whether they have caught and punished the correct person. This statement aligns with the passage's argument and cannot be a contradiction.
C. Narrow – The passage clearly argues that the true crime genre includes a variety of story types, one of which is the "Wrongful Conviction Story." This statement does not contradict the passage, as it aligns with the author's point of view.

D. Extreme – The passage acknowledges that journalists must innovate their narrative–building techniques to keep readers engaged and to bring them closer to the reality of the justice system. This statement does not contradict the passage but rather supports one of its points.

A is the correct option. The statement "True crime stories do not offer any cultural value" contradicts the passage's arguments.

15. **(b)**

A. Narrow – The passage does mention critiques of true crime stories, but this statement does not capture the essence of the passage. The passage discusses both the negative and positive aspects of true crime stories and highlights the "Wrongful Conviction Story" subgenre as particularly valuable.

B. Close – This statement captures the core of the passage, which discusses the true crime genre's potential to engage readers and bring attention to significant policy issues, particularly through the "Wrongful Conviction Story" subgenre. This statement encompasses the broader scope of the passage.

C. Extreme – While the passage acknowledges some of the critiques of true crime stories, it does not advocate for journalists to avoid writing about them altogether. Instead, the passage emphasizes the importance of innovation and the potential for true crime stories to bring attention to important issues within the criminal justice system.

D. Alien – The passage does not focus on the popularity of true crime stories due to their entertainment value or sensationalism. Instead, the passage explores the potential for true crime stories to engage readers in meaningful discussions about the criminal justice system, particularly through the "Wrongful Conviction Story" subgenre.

Hence, option B is the correct answer.

16. **(a)**

A. Close – This option captures the main issues discussed in the passage: the true crime genre and its cultural value, the "Wrongful Conviction Story" subgenre, and the need for innovation in journalism to maintain reader interest.

B. Alien – Sensationalism and entertainment are not the main focus of the passage, although they are mentioned indirectly. White women victims are mentioned as a critique, but not as a central theme. Law & Order is mentioned, but it is not central to the passage's discussion.

C. Narrow – This option focuses on a few issues mentioned in the passage, but it does not encapsulate the broader themes of the passage. Crime podcasts, paranoia, and myopic focus are mentioned, but they are not the central focus. Objective truth is discussed in the context of the "Wrongful Conviction Story," but it is not a central theme.

D. Close – This option highlights some of the main issues discussed in the passage, such as narrative storytelling, scrutiny of the justice system, and the comparison between true crime stories and the heroes–and–villains worlds of Law & Order and NCIS. However, it does not capture the essence of the passage as well as option A.

Based on the analysis, option A best encapsulates the issues discussed in the passage, as it captures the main themes: true crime, cultural value, wrongful conviction, and innovation. Options B and C can be easily eliminated, while option D is close but not as comprehensive as option A.

Therefore, the correct answer is: A. True crime, cultural value, wrongful conviction, innovation.

17. **(2413)**

The correct sequence is 2413. Statement 2 introduces the mass production of plastic and its replacement of traditional materials. Statement 4 then explains why plastic became a popular choice for various applications, leading to its widespread use. Statement 1 shows the increasing awareness of the environmental problems caused by plastic waste, as a result of its widespread use. Finally, Statement 3 mentions the actions taken by governments and corporations to address the

issues caused by plastic waste. This sequence provides a clear progression from the introduction of plastic to the environmental problems it causes and the efforts to mitigate those problems, making it a logically consistent arrangement of statements.

18. **(2341)**

The correct sequence is 2341. Statement 2 introduces the Agricultural Revolution as a period of significant agricultural development in the 18th and early 19th centuries. Statement 3 explains the driving force behind the revolution, which was the increasing demand for food due to population growth and urbanization. Statement 4 provides information about the origin of the revolution in England and its spread to other regions, influencing agricultural practices worldwide. Finally, Statement 1 discusses the outcome of the revolution, with the development of new farming techniques, tools, and systems aimed at increasing agricultural production. This sequence presents a logical progression from the context of the Agricultural Revolution to the factors driving it, its spread, and its impacts on farming, making it a logically consistent arrangement of statements.

19. **(4213)**

The correct sequence is 4213. This sequence is correct because it provides a clear understanding of the Renaissance and Leonardo da Vinci's contributions to it. Statement 4 introduces the Renaissance as a period of renewed interest in art, science, and literature. Statement 2 elaborates on the Renaissance by mentioning the emergence of accomplished artists and scientists during this period. Statement 1 then introduces Leonardo da Vinci as a true Renaissance polymath, connecting his extensive knowledge to the broader context of the Renaissance. Finally, Statement 3 gives an example of da Vinci's work by discussing the Mona Lisa as one of his most famous and enigmatic masterpieces. This sequence presents a coherent and comprehensive overview of the Renaissance and Leonardo da Vinci's contributions.

20. **(4123)**

The correct sequence is 4123. This sequence is correct because it provides a clear understanding of the historical context and development of the theory of evolution and Charles Darwin's contribution. Statement 4 introduces the dominant theory before Darwin, which stated that all species were created independently and had fixed traits. Statement 1 then presents Charles Darwin's development of the theory of natural selection, which became a cornerstone of modern evolutionary thought. Statement 2 explains the concept of natural selection, highlighting how species with favorable traits for survival and reproduction have a higher likelihood of passing those traits on to the next generation. Finally, Statement 3 acknowledges the changes and refinements in the theory of evolution since Darwin's time, while emphasizing that the fundamental principles remain intact. This sequence offers a coherent and comprehensive overview.

21. **(1)**

Statements 2, 3, 4, and 5 make a logical block that narrates the story of the discovery and transformation of Antarctica. Statement 2 highlights that even though some peoples knew of the region, they never settled there due to its harsh conditions. Statement 3 tells us about the credited discovery of the continent in 1820, marking the start of the 'known' history of Antarctica. Statement 4 details the different stages of human interaction with Antarctica, from hunting ground to highly protected environment. Finally, statement 5 concludes by presenting the current state of Antarctica as a paradox between protection and climate change impacts.

In contrast, statement 1, while discussing the concept of Antarctica as theorized by Aristotle, does not fit within the narrative constructed by the other statements. It mentions the idea of Antarctica as an 'ant–Arctic', but this idea isn't

carried forward or expanded upon in any of the other statements, making it the odd one out.

22. **(2)**

Statements 1, 3, 4, and 5 all discuss various aspects of xenotransplantation, a controversial yet potentially beneficial practice. Statement 1 introduces the concept of xenotransplantation, while statement 3 elaborates on its purpose and potential to alleviate the shortage of human organs for transplant. Statement 4 adds a broader context of human–animal interaction, discussing how many animals are killed each year for various human needs, which could include organ transplantation. Statement 5 then tackles the ethics of the issue, referencing the common defense that human lives have more ethical weight.

In contrast, statement 2 discusses renewable energy and society's dependence on fossil fuels. Although this is a significant issue, it doesn't relate directly to the topic of xenotransplantation and the ethical considerations around it. As such, it is the odd one out.

23. **(b)**

A. This option is too narrow as it only focuses on the impact of social media and technology on extreme sports, but the passage discusses the broader historical context and evolution of extreme sports, not just their current popularity.
B. This option accurately captures the overall theme of the passage, which discusses the history of extreme sports and their evolution over time, including the shift toward making them safer in modern times. This is the correct answer.
C. This option is too narrow because it only focuses on the transformation of bungee jumping, while the passage discusses a variety of extreme sports and their history, not just the development of bungee jumping.

D. This option is too broad and a bit alien, as the passage does not delve deeply into the role of extreme sports in shaping human culture. It does discuss the historical context of extreme sports and their evolution, but it doesn't focus on their influence on human culture as a whole.

24. **(a)**

A. This option accurately summarizes the passage, which discusses the political context of early superhero comics, such as Captain America, and the connection between their sales and the political climate of the time. This is the correct answer.
B. This option is too broad as it covers the entire evolution of the superhero genre and its impact on society, while the passage specifically focuses on the early history of superhero comics and their political context.
C. This option is too narrow because it only focuses on the origin of comic books and their low–quality production, while the passage discusses the political context and significance of early superhero comics, not just their production quality.
D. This option is alien as it introduces the idea of a shifting perception of comic books from immature to complex, which is not explicitly discussed in the passage. The passage focuses more on the political context and significance of early superhero comics.

LRDI

25. **(3)**

Total number of classes to be held in two slots during all the seven days will be $2 \times 7 = 14$. Since the number of morning slots for each professor are the same as the number of evening slots then there will be an even number of classes taken by each professor. Hence the only possible combination of the number of classes for each professor is 4,4,4 2.

Since Prof B and Prof C take an equal number of classes then they both take 4 classes.

Day	Morning	Evening
Monday	B	
Tuesday	A	
Wednesday	D	A
Thursday		
Friday		D
Saturday		
Sunday		B

Since B takes 4 classes in the week and B can't take classes Tuesday and Saturday (Because of the given condition that no professor can take classes on three consecutive days), the other two slots for B are on Thursday and Friday. And by condition 3, the only slots for B are Thursday evening and Friday morning.
Now, Prof C also takes 4 classes so 4 slots satisfying all the conditions can be Thursday morning, Saturday evening, Sunday morning and Tuesday evening.

Day	Morning	Evening
Monday	B	
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday		C
Sunday	C	B

Now only two slots are remaining, Monday Evening and Saturday Morning, and these two classes will be taken by Either Prof A or Prof D.
We can't put Monday morning to Prof A otherwise it will violate the condition of three consecutive classes so both these classes will be taken by prof D which satisfies all the conditions. So final table look like this:

Day	Morning	Evening
Monday	B	D

Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday	D	C
Sunday	C	B

Only 1 arrangement is possible.

26.   (2)
Total number of classes to be held during seven days will be 14. Since morning slots for each professor are the same as evening slots then there will be an even number of classes taken by each professor. Hence the only possible combination of the number of classes for each professor is 4,4,4 2.
Since Prof B and Prof C take an equal number of classes then they both take 4 classes.

Day	Morning	Evening
Monday	B	
Tuesday	A	
Wednesday	D	A
Thursday		
Friday		D
Saturday		
Sunday		B

Since B takes 4 classes in the week and B can't take classes Tuesday and Saturday (Because of the given condition that no professor can take classes on three consecutive days), the other two slots for B are on Thursday and Friday. And by condition 3, the only slots for B are Thursday evening and Friday morning.

Now, Prof C also takes 4 classes so 4 slots satisfying all the conditions can be Thursday morning, Saturday evening, Sunday morning and Tuesday evening.

Day	Morning	Evening
Monday	B	

Day	Morning	Evening
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday		C
Sunday	C	B

Now only two slots are remaining, Monday Evening and Saturday Morning, and these two classes will be taken by Either Prof A or Prof D.

We can't put Monday morning to Prof A otherwise it will violate the condition of three consecutive classes so both these classes will be taken by prof D which satisfies all the conditions. So final table look like this:

Day	Morning	Evening
Monday	B	D
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday	D	C
Sunday	C	B

Prof A took 2 classes in the week.

27. **(d)**
Total number of classes to be held during seven days will be 14. Since morning slots for each professor are the same as evening slots then there will be an even number of classes taken by each professor. Hence the only possible combination of the number of classes for each professor is 4,4,4 2.

Since Prof B and Prof C take an equal number of classes then they both take 4 classes.

Day	Morning	Evening
Monday	B	
Tuesday	A	
Wednesday	D	A
Thursday		
Friday		D

Day	Morning	Evening
Saturday		
Sunday		B

Since B takes 4 classes in the week and B can't take classes Tuesday and Saturday (Because of the given condition that no professor can take classes on three consecutive days), the other two slots for B are on Thursday and Friday. And by condition 3, the only slots for B are Thursday evening and Friday morning.

Now, Prof C also takes 4 classes so 4 slots satisfying all the conditions can be Thursday morning, Saturday evening, Sunday morning and Tuesday evening.

Day	Morning	Evening
Monday	B	
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday		C
Sunday	C	B

Now only two slots are remaining, Monday Evening and Saturday Morning, and these two classes will be taken by Either Prof A or Prof D.

We can't put Monday morning to Prof A otherwise it will violate the condition of three consecutive classes so both these classes will be taken by prof D which satisfies all the conditions. So final table look like this:

Day	Morning	Evening
Monday	B	D
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday	D	C
Sunday	C	B

Monday Evening class was taken by professor D.

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28. **(15800)**
Total number of classes to be held during seven days will be 14. Since morning slots for each professor are the same as evening slots then there

will be an even number of classes taken by each professor. Hence the only possible combination of the number of classes for each professor is 4,4,4 2.

Since Prof B and Prof C take an equal number of classes then they both take 4 classes.

Day	Morning	Evening
Monday	B	
Tuesday	A	
Wednesday	D	A
Thursday		
Friday		D
Saturday		
Sunday		B

Since B takes 4 classes in the week and B can't take classes Tuesday and Saturday (Because of the given condition that no professor can take classes on three consecutive days), the other two slots for B are on Thursday and Friday. And by condition 3, the only slots for B are Thursday evening and Friday morning.

Now, Prof C also takes 4 classes so 4 slots satisfying all the conditions can be Thursday morning, Saturday evening, Sunday morning and Tuesday evening.

Day	Morning	Evening
Monday	B	
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday		C
Sunday	C	B

Now only two slots are remaining, Monday Evening and Saturday Morning, and these two classes will be taken by Either Prof A or Prof D. We can't put Monday morning to Prof A otherwise it will violate the condition of three consecutive classes so both these classes will be

taken by prof D which satisfies all the conditions. So final table look like this:

Day	Morning	Evening
Monday	B	D
Tuesday	A	C
Wednesday	D	A
Thursday	C	B
Friday	B	D
Saturday	D	C
Sunday	C	B

Amount earned by professor A = 2 × 2500 = 5000

Amount earned by professor C = 4 × 2700 = 10800

Total amount earned by both the professors = 15800.

29. **(a)**

For city A:

Total number of NRIs = $\dfrac{24}{100} \times 40000 = 9600$

Number of male NRIs = $\dfrac{60}{100} \times 9600 = 5760$

Number of female NRIs = 9600 – 5760 = 3840

Similarly, we can calculate for all the cities, as in the following table:

Cities	Total	Males	Females
City A	$\dfrac{24}{100} \times 40000$ = 9600	$\dfrac{60}{100} \times 9600$ = 5760	9600 – 5760 = 3840
City B	$\dfrac{12}{100} \times 40000$ = 4800	$\dfrac{45}{100} \times 4800$ = 2160	4800 – 1280 = 2640
City C	$\dfrac{10}{100} \times 40000$ = 4000	$\dfrac{32}{100} \times 4000$ = 1280	4000 – 1280 = 2720
City D	$\dfrac{32}{100} \times 40000$ = 12800	$\dfrac{36}{100} \times 12800$ = 4608	12800 – 4608 = 8192

City E	$\frac{22}{100} \times 40000$ $= 8800$	$\frac{40}{100} \times 8800$ $= 3520$	$8800 - 3520$ $= 5280$

Number of male NRIs in city A = 5760
Number of male NRIs in city E = 3520

Required percentage $= \frac{5760}{3520} \times 100$

$= 163.63\%$
$= 164\%$ approx.

30. **(5600)**
For city A:

Total number of NRIs $= \frac{24}{100} \times 4000 = 9600$

Number of male NRIs $= \frac{60}{100} \times 9600 = 5760$

Number of female NRIs = 9600 – 5760 = 3840
Similarly, we can calculate for all the cities, as in the following table:

Cities	Total	Males	Females
City A	$\frac{24}{100} \times 40000$ $= 9600$	$\frac{60}{100} \times 9600$ $= 5760$	$9600 - 5760$ $= 3840$
City B	$\frac{12}{100} \times 40000$ $= 4800$	$\frac{45}{100} \times 4800$ $= 2160$	$4800 - 1280$ $= 2640$
City C	$\frac{10}{100} \times 40000$ $= 4000$	$\frac{32}{100} \times 4000$ $= 1280$	$4000 - 1280$ $= 2720$
City D	$\frac{32}{100} \times 40000$ $= 12800$	$\frac{36}{100} \times 12800$ $= 4608$	$12800 - 4608$ $= 8192$
City E	$\frac{22}{100} \times 40000$ $= 8800$	$\frac{40}{100} \times 8800$ $= 3520$	$8800 - 3520$ $= 5280$

Total number of NRIs in city C = 4000

Total population of city C =

$4000 \times \frac{(100 + 160)}{100} = 4000 \times \frac{260}{100} = 10400$

Total number of males in city C =

$\frac{7}{(7 + 6)} \times 10400 = \frac{7}{13} \times 10400 = 5600$

31. **(5552)**
For city A:

Total number of NRIs $= \frac{24}{100} \times 40000 = 9600$

Number of male NRIs $= \frac{60}{100} \times 9600 = 5760$

Number of female NRIs = 9600 – 5760 = 3840
Similarly, we can calculate for all the cities, as in the following table:

Cities	Total	Males	Females
City A	$\frac{24}{100} \times 40000$ $= 9600$	$\frac{60}{100} \times 9600$ $= 5760$	$9600 - 5760$ $= 3840$
City B	$\frac{12}{100} \times 40000$ $= 4800$	$\frac{45}{100} \times 4800$ $= 2160$	$4800 - 1280$ $= 2640$
City C	$\frac{10}{100} \times 40000$ $= 4000$	$\frac{32}{100} \times 4000$ $= 1280$	$4000 - 1280$ $= 2720$
City D	$\frac{32}{100} \times 40000$ $= 12800$	$\frac{36}{100} \times 12800$ $= 4608$	$12800 - 4608$ $= 8192$
City E	$\frac{22}{100} \times 40000$ $= 8800$	$\frac{40}{100} \times 8800$ $= 3520$	$8800 - 3520$ $= 5280$

Number of female NRIs in city B = 2640
Number of female NRIs in city D = 8192
Required difference = 8192 – 2640 = 5552

32. **(b)**
For city A:

Total number of NRIs = $\dfrac{24}{100} \times 40000 = 9600$

Number of male NRIs = $\dfrac{60}{100} \times 9600 = 5760$

Number of female NRIs = $9600 - 5760 = 3840$

Similarly, we can calculate for all the cities, as in the following table:

Cities	Total	Males	Females
City A	$\dfrac{24}{100} \times 40000$ $= 9600$	$\dfrac{60}{100} \times 9600$ $= 5760$	$9600 - 5760$ $= 3840$
City B	$\dfrac{12}{100} \times 40000$ $= 4800$	$\dfrac{45}{100} \times 4800$ $= 2160$	$4800 - 1280$ $= 2640$
City C	$\dfrac{10}{100} \times 40000$ $= 4000$	$\dfrac{32}{100} \times 4000$ $= 1280$	$4000 - 1280$ $= 2720$
City D	$\dfrac{32}{100} \times 40000$ $= 12800$	$\dfrac{36}{100} \times 12800$ $= 4608$	$12800 - 4608$ $= 8192$
City E	$\dfrac{22}{100} \times 40000$ $= 8800$	$\dfrac{40}{100} \times 8800$ $= 3520$	$8800 - 3520$ $= 5280$

Number of female NRIs in city A = 3840
Number of female NRIs in city B = 2640 (Minimum)
Number of female NRIs in city C = 2720
Number of female NRIs in city D = 8192
Number of female NRIs in city E = 5280

33. **(4480)**
For city A:

Total number of NRIs = $\dfrac{24}{100} \times 40000 = 9600$

Number of male NRIs = $\dfrac{60}{100} \times 9600 = 5760$

Number of female NRIs = $9600 - 5760 = 3840$

Similarly, we can calculate for all the cities, as in the following table:

Cities	Total	Males	Females
City A	$\dfrac{24}{100} \times 40000$ $= 9600$	$\dfrac{60}{100} \times 9600$ $= 5760$	$9600 - 5760$ $= 3840$
City B	$\dfrac{12}{100} \times 40000$ $= 4800$	$\dfrac{45}{100} \times 4800$ $= 2160$	$4800 - 1280$ $= 2640$
City C	$\dfrac{10}{100} \times 40000$ $= 4000$	$\dfrac{32}{100} \times 4000$ $= 1280$	$4000 - 1280$ $= 2720$
City D	$\dfrac{32}{100} \times 40000$ $= 12800$	$\dfrac{36}{100} \times 12800$ $= 4608$	$12800 - 4608$ $= 8192$
City E	$\dfrac{22}{100} \times 40000$ $= 8800$	$\dfrac{40}{100} \times 8800$ $= 3520$	$8800 - 3520$ $= 5280$

Number of male NRIs in city A = 5760
Number of male NRIs in city C = 1280
Hence, the required difference = 5760–1280 = 4480

34. **(d)**
Nobody was invited immediately before the one who was given chrysanthemums.
Detailed Explanation:
The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. As 13 = 6 + 1 + 6, so there was one person invited as guest in between B and O. The one who was invited immediately before O was given orchids. O was not the last guest to be invited.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs						
		Orchids/	A	Lilacs				
	O/			Orchids	A	Lilacs		
			O			Orchids	A	Lilacs
	B				O			Orchids
		/Orchids	B				O	
	O/				B			
							B	

There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. The one who was invited immediately after R was given lilies. R was invited before B. R was not invited in June. O was not given lilies. The bouquets were given to the guests such that no two consecutive guests were given flowers whose names stan with the letter 'L'.

Date	Case 1		Case 2		Case 3		Cas
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest
25th June	A	Lilacs		Chrys		L	
	R/	Chrys	A	Lilacs		Chrys	
		L		Orchids	A	Lilacs	
	R/		O	L		Orchids	A
	B	L	R		O	L	
		Orchids	B	Lilies	R		O
	O	L			B	Lilies	R
				L			B

The one who was given camellias was invited as guest on 11 August. In between 25 June and 11 August, there are 46 days. If 6 persons were invited between the first person and the one who was given camellias, then minimum number of days between the dates on which these two persons were invited = 6 × 7 + 6 = 48 > 46. So, less than 6 persons were invited between these two persons. It 4 persons were invited between these two persons, then maximum number of days between the dates on which these two persons were invited = 8 × 5 + 4 = 44 < 46.
So, more than 4 persons were invited between these two persons. Hence, 5 persons were invited between the first person and the one who was given camellias.
So, case 1 and case 3 are invalid.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		
	A	Lilacs		L
		Orchids		Chrys
	O	L	A	Lilacs
	R			Orchids
	B	Lilies	O	L
11th Aug		Camellias	R	Camellias
		L	B	Lilies

There were 14 days in between the dates on which X and the one who was given roses were invited.
14 = 6 + 1 + 7, so there was one guest in between X and the one who was given roses.
H and X were invited in the same month. H was invited before 19 August.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		Roses
	A	Lilacs		L
		Orchids	X	Chrys
	O	L	A	Lilacs
	R	Roses		Orchids
	B	Lilies	O	L
11th Aug	X	Camellias	R	Camellias
	H	L	B	Lilies

T was invited immediately before the one who was given lotuses. T was not given roses. There were more than 7 days in between the dates on which N and the one who was given roses were invited.
Since there are 14 days between the dates on which X and the one who was given roses were invited, so, case 4 is invalid.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
	A	Lilacs
	T	Orchids

	O	Lotuses
27th July	R	Roses
	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Since there were 7 days in between the dates on which A and the one who was given chrysanthemums were invited, so, A was invited on 3 July.

There were 8 days in between the dates on which T was invited and the guest immediately before him was invited.

So, T was invited on 12 July. Also, in between B and O, it was 13 (= 6 + 1 +6) days. So, O was invited on 20 July and a was invited on 3 Aug.

Date	Case 2	
	Guest	**Flowers**
25th June	N	Chrys
3th July	A	Lilacs
12 July	T	Orchids
20th July	O	Lotuses
27th July	R	Roses
3 Aug	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

35.   **(a)**
Detailed Explanation:
The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. As 13 = 6 + 1 + 6, so there was one person invited as guest in between B and O. The one who was invited immediately before O was given orchids. O was not the last guest to be invited.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs						
		Orchids/	A	Lilacs				
	O/			Orchids	A	Lilacs		
			O			Orchids	A	Lilacs
	B				O			Orchids
		/Orchids	B				O	
	O/				B			
							B	

There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. The one who was invited immediately after R was given lilies. R was invited before B. R was not invited in June. O was not given lilies. The bouquets were given to the guests such that no two consecutive guests were given flowers whose names stan with the letter 'L'.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs		Chrys		L		
	R/	Chrys	A	Lilacs		Chrys		L
		L		Orchids	A	Lilacs		Chrys
	R/		O	L		Orchids	A	Lilacs
	B	L	R		O	L		Orchids
		Orchids	B	Lilies	R		O	L
	O	L			B	Lilies	R	
				L			B	Lilies

The one who was given camellias was invited as guest on 11 August. In between 25 June and 11 August, there are 46 days. If 6 persons were invited between the first person and the one who was given camellias, then minimum number of days between the dates on which these two persons were invited = 6 × 7 + 6 = 48 > 46. So, less than 6 persons were invited between these two persons. It 4 persons were invited between these two persons, then maximum number of days between the dates on which these two persons were invited = 8 × 5 + 4 = 44 < 46.

So, more than 4 persons were invited between these two persons. Hence, 5 persons were invited between the first person and the one who was given camellias.

So, case 1 and case 3 are invalid.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		
	A	Lilacs		L
		Orchids		Chrys
	O	L	A	Lilacs
	R			Orchids
	B	Lilies	O	L
11th Aug		Camellias	R	Camellias
		L	B	Lilies

There were 14 days in between the dates on which X and the one who was given roses were invited.

14 = 6 + 1 + 7, so there was one guest in between X and the one who was given roses.

H and X were invited in the same month. H was invited before 19 August.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		Roses
	A	Lilacs		L
		Orchids	X	Chrys
	O	L	A	Lilacs
	R	Roses		Orchids
	B	Lilies	O	L
11th Aug	X	Camellias	R	Camellias
	H	L	B	Lilies

T was invited immediately before the one who was given lotuses. T was not given roses. There were more than 7 days in between the dates on which N and the one who was given roses were invited.

Since there are 14 days between the dates on which X and the one who was given roses were invited, so, case 4 is invalid.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
	A	Lilacs
	T	Orchids
	O	Lotuses
27th July	R	Roses

	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Since there were 7 days in between the dates on which A and the one who was given chrysanthemums were invited, so, A was invited on 3 July.

There were 8 days in between the dates on which T was invited and the guest immediately before him was invited.

So, T was invited on 12 July. Also, in between B and O, it was 13 (= 6 + 1 +6) days. So, O was invited on 20 July and a was invited on 3 Aug.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
3th July	A	Lilacs
12 July	T	Orchids
20th July	O	Lotuses
27th July	R	Roses
3 Aug	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

T was invited on 12 July.

36. **(d)**
X was given Camellias.

Detailed Explanation:
The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. As 13 = 6 + 1 + 6, so there was one person invited as guest in between B and O. The one who was invited immediately before O was given orchids. O was not the last guest to be invited.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs						
		Orchids/	A	Lilacs				
	O/			Orchids	A	Lilacs		
			O			Orchids	A	Lilacs
	B				O			Orchids
		/Orchids	B				O	
	O/				B			
							B	

There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. The one who was invited immediately after R was given lilies. R was invited before B. R was not invited in June. O was not given lilies. The bouquets were given to the guests such that no two consecutive guests were given flowers whose names stan with the letter 'L'.

Date	Case 1		Case 2		Case 3		Cas
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest
25th June	A	Lilacs		Chrys		L	
	R/	Chrys	A	Lilacs		Chrys	
		L		Orchids	A	Lilacs	
	R/		O	L		Orchids	A
	B	L	R		O	L	
		Orchids	B	Lilies	R		O
	O	L			B	Lilies	R
				L			B

The one who was given camellias was invited as guest on 11 August. In between 25 June and 11 August, there are 46 days. If 6 persons were invited between the first person and the one who was given camellias, then minimum number of days between the dates on which these two persons were invited = $6 \times 7 + 6 = 48 > 46$. So, less than 6 persons were invited between these two persons. It 4 persons were invited between these two persons, then maximum number of days between the dates on which these two persons were invited = $8 \times 5 + 4 = 44 < 46$.

So, more than 4 persons were invited between these two persons. Hence, 5 persons were invited between the first person and the one who was given camellias.

So, case 1 and case 3 are invalid.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		
	A	Lilacs		L
		Orchids		Chrys
	O	L	A	Lilacs
	R			Orchids
	B	Lilies	O	L
11th Aug		Camellias	R	Camellias
		L	B	Lilies

There were 14 days in between the dates on which X and the one who was given roses were invited.
14 = 6 + 1 + 7, so there was one guest in between X and the one who was given roses.
H and X were invited in the same month. H was invited before 19 August.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		Roses
	A	Lilacs		L
		Orchids	X	Chrys
	O	L	A	Lilacs
	R	Roses		Orchids
	B	Lilies	O	L
11th Aug	X	Camellias	R	Camellias
	H	L	B	Lilies

T was invited immediately before the one who was given lotuses. T was not given roses. There were more than 7 days in between the dates on which N and the one who was given roses were invited.
Since there are 14 days between the dates on which X and the one who was given roses were invited, so, case 4 is invalid.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
	A	Lilacs
	T	Orchids

	O	Lotuses
27th July	R	Roses
	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Since there were 7 days in between the dates on which A and the one who was given chrysanthemums were invited, so, A was invited on 3 July.

There were 8 days in between the dates on which T was invited and the guest immediately before him was invited.

So, T was invited on 12 July. Also, in between B and O, it was 13 (= 6 + 1 +6) days. So, O was invited on 20 July and a was invited on 3 Aug.

Date	Case 2	
	Guest	**Flowers**
25th June	N	Chrys
3th July	A	Lilacs
12 July	T	Orchids
20th July	O	Lotuses
27th July	R	Roses
3 Aug	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

37. **(c)**

Detailed Explanation:

The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. As 13 = 6 + 1 + 6, so there was one person invited as guest in between B and O. The one who was invited immediately before O was given orchids. O was not the last guest to be invited.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs						
		Orchids/	A	Lilacs				
	O/			Orchids	A	Lilacs		
				O		Orchids	A	Lilacs
	B					O		Orchids
		/Orchids	B				O	
	O/				B			
							B	

There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. The one who was invited immediately after R was given lilies. R was invited before B. R was not invited in June. O was not given lilies. The bouquets were given to the guests such that no two consecutive guests were given flowers whose names stan with the letter 'L'.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs		Chrys		L		
	R/	Chrys	A	Lilacs		Chrys		L
		L		Orchids	A	Lilacs		Chrys
	R/		O	L		Orchids	A	Lilacs
	B	L	R		O	L		Orchids
		Orchids	B	Lilies	R		O	L
	O	L			B	Lilies	R	
				L			B	Lilies

The one who was given camellias was invited as guest on 11 August. In between 25 June and 11 August, there are 46 days. If 6 persons were invited between the first person and the one who was given camellias, then minimum number of days between the dates on which these two persons were invited = 6 × 7 + 6 = 48 > 46. So, less than 6 persons were invited between these two persons. It 4 persons were invited between these two persons, then maximum number of days between the dates on which these two persons were invited = 8 × 5 + 4 = 44 < 46.

So, more than 4 persons were invited between these two persons. Hence, 5 persons were invited between the first person and the one who was given camellias.

So, case 1 and case 3 are invalid.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		
	A	Lilacs		L
		Orchids		Chrys
	O	L	A	Lilacs
	R			Orchids
	B	Lilies	O	L
11th Aug		Camellias	R	Camellias
		L	B	Lilies

There were 14 days in between the dates on which X and the one who was given roses were invited.

14 = 6 + 1 + 7, so there was one guest in between X and the one who was given roses.

H and X were invited in the same month. H was invited before 19 August.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		Roses
	A	Lilacs		L
		Orchids	X	Chrys
	O	L	A	Lilacs
	R	Roses		Orchids
	B	Lilies	O	L
11th Aug	X	Camellias	R	Camellias
	H	L	B	Lilies

T was invited immediately before the one who was given lotuses. T was not given roses. There were more than 7 days in between the dates on which N and the one who was given roses were invited.

Since there are 14 days between the dates on which X and the one who was given roses were invited, so, case 4 is invalid.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
	A	Lilacs

Date		
	T	Orchids
	O	Lotuses
27th July	R	Roses
	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Since there were 7 days in between the dates on which A and the one who was given chrysanthemums were invited, so, A was invited on 3 July.

There were 8 days in between the dates on which T was invited and the guest immediately before him was invited.

So, T was invited on 12 July. Also, in between B and O, it was 13 (= 6 + 1 +6) days. So, O was invited on 20 July and a was invited on 3 Aug.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
3rd July	A	Lilacs
12 July	T	Orchids
20th July	O	Lotuses
27th July	R	Roses
3 Aug	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Two guests were invited in between the ones who were given lavenders and roses.

38.   (b)
Detailed Explanation:
The first guest was invited on 25 June. Three guests were invited between A and B such that A was invited before B. A was given lilacs. There were 13 days in between the dates on which B and O were invited. As 13 = 6 + 1 + 6, so there was one person invited as guest in between B and O. The one who was invited immediately before O was given orchids. O was not the last guest to be invited.

Date	Case 1		Case 2		Case 3		Case 4	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	Flowers
25th June	A	Lilacs						
		Orchids/	A	Lilacs				
	O/			Orchids	A	Lilacs		
			O			Orchids	A	Lilacs
	B				O			Orchids
		/Orchids	B				O	
	O/				B			
							B	

There were 7 days in between the dates on which A and the one who was given chrysanthemums were invited. The one who was invited immediately after R was given lilies. R was invited before B. R was not invited in June. O was not given lilies. The bouquets were given to the guests such that no two consecutive guests were given flowers whose names stan with the letter 'L'.

Date	Case 1		Case 2		Case 3		Cas	
	Guest	Flowers	Guest	Flowers	Guest	Flowers	Guest	l
25th June	A	Lilacs		Chrys		L		
	R/	Chrys	A	Lilacs		Chrys		
		L		Orchids	A	Lilacs		
	R/		O	L		Orchids	A	
	B	L	R		O	L		
		Orchids	B	Lilies	R		O	
	O	L			B	Lilies	R	
				L			B	

The one who was given camellias was invited as guest on 11 August. In between 25 June and 11 August, there are 46 days. If 6 persons were invited between the first person and the one who was given camellias, then minimum number of days between the dates on which these two persons were invited = 6 × 7 + 6 = 48 > 46. So, less than 6 persons were invited between these two persons. It 4 persons were invited between these two persons, then maximum number of days between the dates on which these two persons were invited = 8 × 5 + 4 = 44 < 46.

So, more than 4 persons were invited between these two persons. Hence, 5 persons were invited between the first person and the one who was given camellias.

So, case 1 and case 3 are invalid.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		
	A	Lilacs		L
		Orchids		Chrys
	O	L	A	Lilacs
	R			Orchids
	B	Lilies	O	L
11th Aug		Camellias	R	Camellias
		L	B	Lilies

There were 14 days in between the dates on which X and the one who was given roses were invited.

14 = 6 + 1 + 7, so there was one guest in between X and the one who was given roses.

H and X were invited in the same month. H was invited before 19 August.

Date	Case 2		Case 4	
	Guest	Flowers	Guest	Flowers
25th June		Chrys		Roses
	A	Lilacs		L
		Orchids	X	Chrys
	O	L	A	Lilacs
	R	Roses		Orchids
	B	Lilies	O	L
11th Aug	X	Camellias	R	Camellias
	H	L	B	Lilies

T was invited immediately before the one who was given lotuses. T was not given roses. There were more than 7 days in between the dates on which N and the one who was given roses were invited.

Since there are 14 days between the dates on which X and the one who was given roses were invited, so, case 4 is invalid.

Date	Case 2	
	Guest	Flowers
25th June	N	Chrys
	A	Lilacs
	T	Orchids

	O	Lotuses
27th July	R	Roses
	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

Since there were 7 days in between the dates on which A and the one who was given chrysanthemums were invited, so, A was invited on 3 July.

There were 8 days in between the dates on which T was invited and the guest immediately before him was invited.

So, T was invited on 12 July. Also, in between B and O, it was 13 (= 6 + 1 +6) days. So, O was invited on 20 July and a was invited on 3 Aug.

Date	Case 2	
	Guest	**Flowers**
25th June	N	Chrys
3th July	A	Lilacs
12 July	T	Orchids
20th July	O	Lotuses
27th July	R	Roses
3 Aug	B	Lilies
11th Aug	X	Camellias
18th Aug	H	Lavenders

39. **(d)**

In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)	
Case i	Case ii
Carpenter	Carpenter
Painter – Q	Painter – V
Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	**Case iia**	**Case iib**
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	**Case ii**
Carpenter	Carpenter
Painter	Painter

Roofer	Roofer – O
Electrician	Electrician – R
Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	Case ii
Carpenter	Carpenter
Painter – T	Painter

Roofer – P	Roofer – P
Electrician – R	Electrician – R
	Interior Des. – T

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	Case ii
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

S is the electrician for house (2).

40. **(200)**
In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)

Case i	Case ii
Carpenter	Carpenter
Painter – Q	Painter – V
Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	**Case iia**	**Case iib**
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	**Case ii**
Carpenter	Carpenter
Painter	Painter
Roofer	Roofer – O

Electrician	Electrician – R
Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	**Case ii**
Carpenter	Carpenter
Painter – T	Painter
Roofer – P	Roofer – P
Electrician – R	Electrician – R

	Interior Des. – T	

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	Case ii
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

Required difference = 26200 - 26000 = 200

41. **(d)**

In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)	
Case i	Case ii
Carpenter	Carpenter

Painter – Q	Painter – V
Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	Case iia	Case iib
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	Case ii
Carpenter	Carpenter
Painter	Painter
Roofer	Roofer – O
Electrician	Electrician – R
Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	Case ii
Carpenter	Carpenter
Painter – T	Painter
Roofer – P	Roofer – P
Electrician – R	Electrician – R
	Interior Des. – T

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team,

then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	Case ii
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

(1) and (2) will not have 2 interior designers but it cannot be determined whether (3) will have 2 interior designers or not.

42. **(a)**
In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)	
Case i	Case ii
Carpenter	Carpenter
Painter – Q	Painter – V

Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	**Case iia**	**Case iib**
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	**Case ii**
Carpenter	Carpenter
Painter	Painter
Roofer	Roofer – O
Electrician	Electrician – R

Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	**Case ii**
Carpenter	Carpenter
Painter – T	Painter
Roofer – P	Roofer – P
Electrician – R	Electrician – R
	Interior Des. – T

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	Case ii
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

V will work for all the three houses in the same role.

43. **(10800)**

In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)	
Case i	Case ii
Carpenter	Carpenter
Painter – Q	Painter – V

Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	Case iia	Case iib
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	Case ii
Carpenter	Carpenter
Painter	Painter
Roofer	Roofer – O
Electrician	Electrician – R
Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	**Case ii**
Carpenter	Carpenter
Painter – T	Painter
Roofer – P	Roofer – P
Electrician – R	Electrician – R
	Interior Des. – T

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	**Case ii**
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

Required fees = M + V + Q = Rs. 10800

44. **(c)**

In each team, at least one carpenter, at least one painter, at least one roofer and at least one electrician should work in the team. Two roofers are required for the reconstruction of house (1). P and R will not work together in the reconstruction of house (1). So, S must be the electrician.

House (1)
Carpenter
Painter
Roofer – O
Electrician – S
Roofer – P

S and T will not work together in the same team. So, either Q or V will be a painter.

House (1)	
Case i	**Case ii**
Carpenter	Carpenter
Painter – Q	Painter – V

Electrician – S	Electrician – S
Roofer – O	Roofer – O
Roofer – P	Roofer – P

If Q and V are in the same team, then V will not the carpenter. So, M will be the carpenter in case i. The only two positions left (for case i) are V as painter and N. In case ii, either M or Q will be one carpenter.

House (1)		
Case i	**Case iia**	**Case iib**
Carpenter–M	Carpenter–M	Carpenter–Q
Painter – Q	Painter – V	Painter – V
Roofer – O	Roofer – O	Roofer – O
Electrician–S	Electrician – S	Electrician – S
Roofer – P	Roofer – P	Roofer – P
Painter–V	Carpenter/Painter–Q	Carpenter– M
Interior Des.–N	Interior Des.–N	Interior Des.–N

We see that all three are the same case in which only Q's role is the one we cannot determine.

House (1)
Carpenter–M
Painter – V
Roofer – O
Electrician – S
Roofer – P
Carpenter/Painter – Q
Interior Des. – N
Total = Rs. 26000

House (2) should have an interior designer in its reconstruction and redesigning. S and T will not work together in the same team. P and R will not work together in the reconstruction of house (2).

House (2)	
Case i	**Case ii**
Carpenter	Carpenter
Painter	Painter
Roofer	Roofer – O
Electrician	Electrician – R

Interior Des. – N	Interior Des. – T

If N and O are in the same team more than once, then O will work as a roofer only once. As N and O already worked in house (1) where O was a roofer, so N cannot work in case ii while P will be the roofer in case i. In case ii, only three persons are left to be in the team: M, Q and V but we need tour persons. So, case ii is invalid.

House (2)
Case i
Carpenter –
Painter
Roofer – P
Electrician – S
Interior Des. – N

T and R will not be in the team. So, the four other persons in the team will be M, Q, V, O. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team. So, Q will be the carpenter.

House (2)
Carpenter – M
Painter – O
Roofer – P
Electrician – S
Interior Des. – N
Painter – V
Carpenter – Q
Total = Rs. 26,000

For house (3), R and T definitely will be part of the team. S and T will not work together in the same team. O will not work in the reconstruction of house (3). So, P will be the roofer.

House (3)	
Case i	**Case ii**
Carpenter	Carpenter
Painter – T	Painter

Roofer – P	Roofer – P
Electrician – R	Electrician – R
	Interior Des. – T

So, remaining persons: M, Q, N and V will be part of the team. If Q and V are in the same team, then V will not be the carpenter. More than two painters should not be in any team.

House (1)	House (2)	House (3)	
		Case i	Case ii
Carpenter–M	Carpenter–M	Carpenter–M	Carpenter–M
Painter–V	Painter–O	Painter–T	Painter–V
Roofer–O	Roofer–P	Roofer–P	Roofer–P
Electrician–S	Electrician–S	Electrician–R	Electrician–R
Roofer–P	Interior Des.–N	Interior Des.–T	Interior Des.–T
Carpenter/Painter–Q	Painter–V	Painter–V	Interior Des.–N
Interior Des.–N	Carpenter–Q	Carpenter–Q	Carpenter/Painter–Q
Total = Rs. 26000	Total = Rs. 26,000	Total = Rs. 26,200	Total = Rs. 26,200

Total amount charged for House 3 in both the cases is 26,200

QUANT

45. **(c)**
According to the question, we can form this equation:

$$\frac{\left[\frac{n}{2}(2a+(n-1)d)\right]}{\left[\frac{n}{2}(2a_1+(n-1)d_1)\right]} = \frac{(6n+4)}{(2n+1)}$$

where a and d is first term and common difference of first series

and a_1 and d_1 are first term and common difference of 2nd series.

Therefore, $\dfrac{(2a + (n - 1)d)}{(2a_1 + (n - 1)d_1)} = \dfrac{(6n + 4)}{(2n + 1)}$

Rearranging the terms on LHS, we get

$$\frac{[nd+(2a-d)]}{[nd_1+(2a_1-d_1)]} = \frac{(6n+4)}{(2n+1)}$$

Comparing both sides we get, d = 6, a = 5, d1 = 2 and a1 = 1.5
Ratio of 11th term

$$= \frac{(a+10d)}{(a_1+10d_1)} = \frac{(5+10*6)}{(1.5+10*2)} = \frac{65}{21.5}$$

Hence, required ratio = $\dfrac{130}{43}$

Hence, option (c) is correct

46. **(d)**
It is clear from the figure that, the coordinates of E = (8, –3) and D = (8, 3).

$AE = \sqrt{(8-5)^2 + (-3-0)^2} = 3\sqrt{2}$ units

Similarly,

$CE = CD = AD = 3\sqrt{2}$ units

Hence, AECD is a square.
Also, the radius of both the circle = 3 units
Therefore, the area of each sector created inside each circle = ¼ × The area of each circle
= ¼ × π × 32

$= \dfrac{\pi \times 9}{4}$ sq. units.

So, the area of the two sectors $= \dfrac{\pi \times 9}{4}$

$= \dfrac{\pi}{2}$ sq. units

Now, the area of the square = $(3\sqrt{2})^2$ = 18 sq. units

Hence, the area of the shaded region = The area of the square – Sum of the area of two sectors

$$= 18 - \frac{n}{2}$$

$$= \frac{204 - n}{2} \text{ unit}^2:$$

47. **(770)**

Let the monthly income of Rajnikant = Rs. 100 y

Money, he gave to his sister = $100y \times \frac{30}{100} = 30y$

Thus, the remaining income of Rajnikant = 100y – 30y = 70y

And 60% of his remaining income he invests in business and health policy

$$= 70y \times \frac{60}{100} = 42y$$

Now, according to the question,

$$30y - 42y \times \frac{5}{12} = 1750$$

$$30y - \frac{35}{2}y = 1750$$

$$\frac{60y - 35y}{2} = 1750$$

$$\frac{25y}{2} = 1750$$

$$\Rightarrow \quad y = 140$$

Thus, the monthly income of Rajnikant = 100y = 100 × 140 =Rs. 14000

Money, he gave to his sister = 30 × 140 =Rs. 4200

And money he spent in business =

$$42 \times 140 \times \frac{7}{12} = \text{Rs.}3430$$

Thus, the required difference = 4200 – 3430 = Rs. 770:

48. **(7)**

Given that,

$$2\log_4 \left(5^{\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots} \right) = \left(\log_4 \left(y^2 - 3y + 8 \right) \right) \left(\log_6 5 \right).$$

$$\Rightarrow 2\log_4 \left(5^{\frac{1}{2}\left(1 + \frac{1}{2} + \frac{1}{4} + \cdots\right)} \right)$$

$$= \frac{1}{2}\left(\log_4 \left(y^2 - 3y + 8 \right) \right) \left(\log_6 5 \right)$$

$$\Rightarrow 2\log_4 \left(5^{\frac{1}{2}\left(\frac{1}{\left(1 - \frac{1}{2}\right)} \right)} \right)$$

$$= \frac{1}{2}\left(\log_4 \left(y^2 - 3y + 8 \right) \right) \left(\log_6 5 \right)$$

$$\Rightarrow \log_4 5^1 = \left(\log_4 \left(y^2 - 3y + 8 \right) \right) \left(\log_6 \sqrt{5} \right)$$

Let, $y^2 - 3y + 8 = z$

Then,

$$\log_4 5 = \log_4 z \times \log_6 \sqrt{5}$$

$$\log_4 5 \div \log_4 z = \log_z 5 = \log_6 \sqrt{5} = k \text{ (Let's}$$

assume this as k) $6^k = \sqrt{5}$

On squaring this $(6^k)^2 = 5$

$$\log_4 5 = \log_4 z \times \log_6 \sqrt{5}$$

$$\log_z 5 = \log_6 \sqrt{5}$$

$$\log_z 5 = k$$

$$z^k = 5$$

$(6^k)^2 = z^k = 5$

$(6^2)^k = z^k$

$36^k = z^k$

z = 36.

Therefore,

$y^2 - 3y + 8 = 36$

$\Rightarrow y^2 - 3y - 28 = 0$

$\Rightarrow (y-7)(y+4) = 0$

$\Rightarrow y = 7, -4$

Hence, the maximum value of y is 7.

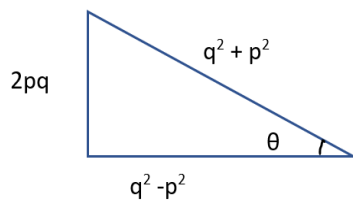**49.** **(b)**

Let $7b + 3c = q$ and $2c - 5a = p$

Then, we have

$$\frac{\theta + \cos q \cos}{\theta - \cos p \cos} \frac{q}{p}\left(-\right)^2 = \frac{2}{2}$$

Now, by using componendo and dividend, we have

$$\frac{1}{\theta \cos q} = \frac{q^2 + p^2}{-p^2} {}_2$$

$$\sec\theta = \frac{q^2 + p^2}{q^2 - p^2}$$

$$\text{Thus, } \cot\theta = \frac{(q^2 - p^2)}{2pq}$$

$$= \frac{1}{2}\left(\frac{q}{p} - \frac{p}{q}\right)$$

$$\theta \cot = \frac{1}{2}\left(\frac{7b+3c}{2c-5a} - \frac{2c-5a}{7b+3c}\right)\ldots(i)$$

Now, $a^2 + 9b^2 + c^2 + 16a + 24b - 10c + 105 = 0$

$\Rightarrow a^2 + 16a + 64 + 9b^2 + 24b + 16 + c^2 - 10c + 25 = 0$

$\Rightarrow (a + 8)^2 + (3b + 4)^2 + (c - 5)^2 = 0$

$\Rightarrow a = -8, b = \dfrac{-4}{3}, c = 5$

Hence, $\dfrac{7b+3c}{2c-5a} = \dfrac{7\left(-\dfrac{4}{3}\right)+3(5)}{2(5)-5(-8)} = \dfrac{17}{150}$

So, $\dfrac{2c-5a}{7b+3c} = \dfrac{150}{17}$

Therefore, from (i), we have

$$\cot\theta = \frac{1}{2}\left(\frac{7b+3c}{2c-5a} - \frac{2c-5a}{7b+3c}\right) = \frac{1}{2}\left(\frac{17}{150} - \frac{150}{17}\right)$$

$$= \frac{1}{2} \times \frac{289 - 22500}{2550} = -\frac{1}{2} \times \frac{22211}{2550} = -\frac{22211}{5100}$$

50. **(112)**

The given function can be written as

$$\frac{49x^4 e^{4x} + 64}{x^2 e^{2x}} = \frac{49x^4 e^{4x}}{x^2 e^{2x}} + \frac{64}{x^2 e^{2x}}$$

$$= 49x^2 e^{2x} + \frac{64}{x^2 e^{2x}}$$

$$= \left(7xe^x\right)^2 + \left(\frac{8}{xe^x}\right)^2$$

so,

$$\frac{49x^4 e^{4x} + 64}{x^2 e^{2x}} = \left(7xe^x\right)^2 + \left(\frac{8}{xe^x}\right)^2$$

Now, by the formula of $QM \geq AM \geq GM \geq HM$ inequalities formula, we have

$$\sqrt{\frac{\left(7xe^x\right)^2 + \left(\frac{8}{xe^x}\right)^2}{2}} \geq \sqrt[3]{7xe^x \cdot \frac{8}{xe^x}}$$

$$\left(7xe^x\right)^2 + \left(\frac{8}{xe^x}\right)^2 \geq 2 \times 56 = 112$$

51. **(71)**

In a group 26% are entrepreneur are at the age of 18–25 years, so 74% are above 25 years old.

In the same group 75% entrepreneurs owns start–up companies and 25% are owns large companies.

The entrepreneurs who owns start–ups at the age of 18–25 years

$$= 25\% \times 75\% = \frac{1}{4} \times 75\% = 18.75\%.$$

So, the remaining $(26 - 18.75)\% = 7.25\%$ are the entrepreneurs who owns large companies at the age of 18–25 years.

Out of 25% entrepreneurs who owns large companies, 7.25% are at the age of 18–25 years old and remaining 17.75% are above 25 years old.

So, the percentage of entrepreneurs above 25 years old among the large company owner is

$= \dfrac{17.75}{25}$ x 100 = 70% $\times 100 = 71\%$

52.   (40)

Let the speed of the fighter Jet to be x and the time taken be t.

Since speed is reduced to $\dfrac{1}{4}$th ,

New speed = $\dfrac{x}{4}$

Since the speed is one–fourth, time taken will be fourth. T = 4t

This 4t is after the scheduled time, So extra 3t = 42 minutes

t = 14 minutes

The Jet travels at $x \dfrac{km}{hr}$ takes 14 minutes and

Jet travels at $\dfrac{x}{4} \dfrac{km}{hr}$ takes 56 minutes.

So, the Jet usually takes 14 minutes to cover the distance.

It travels 7 minutes at the usual speed. That is, it travels $\dfrac{1}{2}$ of the time at the usual speed. So it covers $\dfrac{1}{2}$ of the distance in 7 minutes.

To reach its destination in the on time, the Jet has to travel the remaining $\dfrac{1}{2}$ of the distance in more 7 minutes. Since the Jet landed for 2 minutes, it should now cover the $\dfrac{1}{2}$ of the distance in 5 (7–2 = 5) minutes.

In other words, the Jet has to cover the same distance in $\dfrac{5}{7}$ th of the usual time.

In order to do so, the speed must be $\dfrac{5}{7}$ th of the usual speed. Or the increased speed will be $\dfrac{2}{5}$ th of the usual speed. Which is an increase of 40%.

53.   (5)
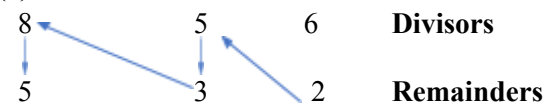
So, the smallest number that satisfy the given condition is {(5×2)+3}×8+5 = 109.

The general form of numbers that satisfy the given condition is got by adding the LCM of divisors, which is 120, to 109.

i.e., the general form is 120k+109, k = 0, 1, 2, 3,….

Therefore, the smallest number is 109.

Now, when 109 is divided by 6, quotient obtained as 18 and leaves remainder as 1.

When 18 is divided by 5, quotient obtained as 3, remainder as 3.

When 3 is divided by 2, quotient obtained as 1, remainder as 1.

Hence, the required sum of the remainders = 1+3+1 = 5:

54.   (b)

Let a be the number of girl players.

Let b be the number of boy players.

$^xc^2 = 91$

$\dfrac{(a!)}{2!(a-2)!} = 91$

a (a–1) = 182

$a^2 - a - 182 = 0$

(a–14)(a+13) = 0

a= 14. There are 14 girl players.

$^yc_2 = 120$

$$\frac{(b!)}{2!(b-2)!} = 120$$

$b^2 - b - 240 = 0$

$(b-16)(b+15) = 0$

$b = 16$. There are 16 boy players.

Number of matches played between a boy and a girl $= {}^{14}c_1 \times {}^{15}c_1 = 14 \times 16 = 224$.

Thus, option (2) is correct.

55. (d)

Since the original cube is cut into 216 smaller cubes, let each side of the original cube be of length 6 units.

Each smaller cube is of length 1 unit.

Now, let the division of these 216 cubes be such that there are x^3 cubes in the first group, y cubes in the second group and z^3 cubes in the third group.

$x^3 + y^3 + z^3 = 216 = 6^3$.

The only possible integer solution is $3^3 + 4^3 + 5^3 = 6^3$. The sides of the new larger cubes are 3, 4 and 5 units. The sum total of the outer surface areas of the three new cubes

$= (6 \times 3^2) + (6 \times 42) + (6 \times 52) = 300$ sq. units

Total surface area of the original larger cube $= 6 \times 6^2 = 216$.

Time required to paint the outer surface of all the three new cubes

$$= 18 \times \frac{300}{216}$$

$= 25$ Mins

56. (b)

Number the pebbles 1 through 19 in order.

From the conditions we can say that the pebbles have either all odd numbers or all even numbers.

There are ${}^{10}C_7$ ways to choose 7 odd–numbered pebbles, and ${}^9C_7$ ways to choose all even–numbered pebbles, so the total number of ways to pick the pebbles is ${}^{10}C_7 + {}^9C_7 = 120 + 36 = 156$.

Option (2) is correct.

57. (b)

Let the fund received by Jadavpur, Calcutta and Bankura Universities be J, C and B crores respectively.

According to the question,

$$\frac{5J}{2} + 10 = \frac{9C}{5} + 15 = \frac{17B}{15} - 8 = x \text{ (say)}$$

$$J = \frac{2(x-10)}{5} \text{ crores}$$

$$C = \frac{5(x-15)}{9} \text{ crores}$$

$$B = \frac{15(x+8)}{17} \text{ crores}$$

Given that, $J + C + B = 105$ crores

$$\frac{2(x-1)}{5} + \frac{5(x-15)}{9} + \frac{15(x+8)}{17} = 105$$

$$\frac{(306x - 3060 + 425x - 6375 + 675x + 5400)}{765} = 105$$

$1406x - 4035 = 105 \times 765$

$1406x = 84360$

$x = 60$

The fund received by Bankura University

$$= \frac{15(60+8)}{17} = 60 \text{ crores}$$

Fraction of total amount received by Bankura University

$$= \frac{60}{105} = \frac{4}{7}$$

Hence, option (b) is correct.

58. (b)

Given, Radius of the base of the cone (R) = 12 m

Height of the Cone (H) = 35 m

$\because$ Slant height (1) $\sqrt{R^2 + H^2}$

$\therefore$ Slant Height $= \sqrt{12^2 + 35^2} = 37m$

We know,

Curved Surface Area of the cone $= \pi Rl$

$\therefore$ Curved Surface Area $= \pi \times 12 \times 37 = 444\pi$ sq. m.

Area of the cloth used = Curved Surface Area of the cone = 444π sq. m.

Given, width of the cloth = 4.8 m
Length of the cloth used = Area of Cloth used/Width of Cloth

$\therefore$ Length of the cloth $\pi\dfrac{444}{4.8} = 92.5$

Thus, option (2) is correct.

59. **(b)**
Given that the radius of the circle is 5 cm.
Therefore, the area of the circle is $=\pi\times52=25\pi$ cm2
Also, the diameter of the circle = 2×5 =10 cm.
Now, since a square is inscribed inside the circle, so the diameter of the circle = diagonal of the square = 10 cm.
Let the side of the square = a cm

Therefore, $a\sqrt{2}$ =10 cm

$a = 5\sqrt{2}$ cm

Hence, the area of the square = $5\sqrt{2} \times 5\sqrt{2}$ =50 cm^2
Thus, the area of the shaded region = area of the circle – area of the square
= 25π–50 cm2
=25(π–2) cm2
Therefore, option (2) is correct.

60. **(d)**
The cost price of the bats bought by Aswin=₹ 1500

Marked price $= 1500 + 1500 \times \dfrac{p}{100}$

$=1500\left(\dfrac{1+p}{100}\right)$

= 15(100+p)
Therefore, the profit = 15(100–p) – 1500
= ₹15p
Now, the cost price of the bats bought by Dhoni
= ₹ 3000

Marked price $= 3000 + 3000 \times \dfrac{3p}{100}$

$=3000\left(\dfrac{1+3p}{100}\right)$

= ₹30 (100+3p)
But, he gives p% of discount, so after the discount, the selling price of the bats become

= 30 (100+3p) - 30(100+3p) x $\dfrac{p}{100}$

= 3000 + 90p-3(100+3p) $\dfrac{p}{100}$

Now, the profit made by Dhoni

$= \dfrac{3000 + 90p - (300p + 9p^2)}{10 - 3000}$

$= ₹ \dfrac{(600p - 9p^2)}{10}$

Thus, by the given condition,

$\dfrac{(600p - 9p^2)}{10}=15p$

i.e., 600p – 9p^2 = 150p
i.e., 9p^2–450p=0
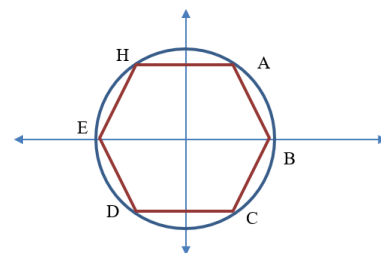i.e., 9p(p–50)=0
i.e., p=50
Hence, option (4) is the correct answer.

61. **(b)**

HA be the incident ray. The co–ordinate of A is

$\left(1,\sqrt{3}\right)$ The Angle of incidence is 60 degree. So the angle of reflection will also be 60 degree. Thus, <HAB = 120 degree. Also, the lengths of HA, AB is equal to 2 unit.
In the similar way we can calculate the angle <ABC. This is also equal to 120 degrees.
Thus, HABCDE will create a regular hexagon.

Thus, there will total five reflections.

62. **(32)**

The diagonals of the rectangle are x–3 = 0 and y–7 = 0.

Both the diagonals are straight lines represented by x = 3 and y = 7.

x = 3 is parallel to Y–axis and y = 7 is parallel to X–axis.

Therefore, the diagonals of the rectangle are perpendicular to each other.

When the diagonals of a rectangle are perpendicular to each other, the rectangle will be a square.

Also, the diagonals of a rectangle bisect each other.

The point of intersection of the 2 diagonals will be (3,7).

(3,7) is the midpoint of the diagonal.

Therefore, the length of the diagonal will be 2*(3–(–1)) = 2*4 = 8 units.

Therefore, the area of the square

$= \dfrac{\text{product of the diagonals}}{2} = \dfrac{8*8}{2} = 32$ square units.

63. **(d)**

(1+log₄x) [1+ (log₄x)² + (log₄x)⁴ + …]

1+ log₄x + (log₄x)² + (log₄x)³ + (log₄x)⁴ + ….. = 2

Log₄x + (log₄x)² + …. = 1

a = log₄x and r = log₄x

$\dfrac{\log_4 x}{1-\log_4 x} = 1$ (for infinite GP series sum $= \dfrac{a}{1-r}$)

log₄x = 1– log₄x

2log₄x = 1

$\text{Log}_4 x = \dfrac{1}{2}$

$x = 4^{\frac{1}{2}}$

x = 2.

Option (d) is correct.

64. **(d)**

If a number is odd, the number raised to any power will be odd. The same holds true for even numbers as well.

Let us evaluate the cases.

f(x,y) = x²+ y² + 5x³y²

When one among I and is odd and the other is even the value of the expression will be odd+ even + even = odd.

When both X and Y are odd, the value of the expression will be odd + odd + odd = odd.

When both x and y are even, the value of the expression will be even + even + even = even.

We know that the value of the function is odd. Therefore, there are 3 cases in total.

X – odd y – even

X – odd y – odd

X – even y – odd

'x' is odd in 2 of the 3 cases. Therefore, the required probability is $\dfrac{2}{3}$.

Hence, option D is the right answer.

65. **(c)**

At x= 0, the value of the function is 20 and this value rejects the first option. Taking some higher values of x, we realize that on the positive side, the value of the function will become negative when we take x greater than 5 since the value of (5, –x) would be negative. Also, the value of f(x) would start tending to –∞ as we take bigger value of x.

Similarly, on the negative side, when we take the value of x lower than –4, f(x) become positive and when we take it further away from 0 on the negative side, the value of f(x) would continue tending to +∞

Hence, option (c) is the answer.

66. **(c)**

If we look at the binary representation of the bottles numbered 1 to 100, all numbers till 100 can be represented using 7 digits.

Now, let us arrange the 7 rabbits in a row and number them 1 to 7. A rabbit is to take a sip from a bottle if the digit corresponding to its poison is 1.

For example, is a number is 1011010, rabbit numbered 1, 3, 4 and 6 will take a sip from this bottle. This way we will be able to identify the combination of 1s for the bottle that contains poison. So, in general the no. of rabbit needed to identify a poisoned bottle would be n such that the number of bottles $\leq 2^n$ & n is the least such integer.

As $100 < 2^7$, n = 7

Therefore, the required answer is 7.

Thus, option (c) is correct.